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L ASSEMBLY AND OPERATION INFORMATION

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R00001 THIS LCC PROGRAM IS INTENDED FOR USE IN THE LM DURING THE MANNED LUNAR LANDING MISSION OR ANY SUBSET THEREOF.
R00002 THE DETAILS OF IMPLEMENTATION ARE SPECIFIED IN REPORT R-567, AS AMENDED.

R00005 GLIDANCE SYSTEM OPERATIONS PLAN
R00003 FOR MANNED LM EARTH ORBITAL AND LUNAR MISSIONS
R000035 USING PROGRAM LUMINARY

R00004 THIS PROGRAM AND R-567 HAVE BEEN PREPARED BY THE INSTRUMENTATION LABORATORY, MASSACHUSETTS INSTITUTE OF
R00005 TECHNOLOGY 75 CAMBRIDGE PARKWAY, CAMBRIDGE, MASSACHUSETTS UNDER PROJECT 55-238-7C, SPONSORED BY THE MANNED
R00006 SPACECRAFT CENTER OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, CONTRACT NAS 9-4065.

R00007 THIS PROGRAM IS REFERRED TO AS LUMINARY 1P

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R0007 FLAGWORD ASSIGNMENTS

R0008 SLEWOUTLINE CALLS

R0009 TABLE OF SUBROUTINE LOG SECTIONS

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R0011 EPASABLE ASSIGNMENTS

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R0028 KALCMANU STEERING

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R0089		ALARM AND ABORT
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R0091		RTB OF CODES
R0092	LMCAP	
R0093		T6-RLFT PROGRAMS
R0094		DAP INTERFACE SUBROUTINES
R0095		CAPICLER PROGRAM
R0096		P-AXIS RCS ALTICPLCT
R0097		Q,R-AXIS RCS AUTOPILOT
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R0099		KALMAN FILTER
R0100		TRIM GINEAL CONTROL SYSTEM

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R0101 ACSTASK AND ACSJOB
R0102 SFS BACK-UP RCS CONTROL

R0103 SYMBOL TABLE LISTING
R0104 UNREFERENCED SYMBOL LISTING
R0105 EPASABLE & EQUALS CROSS-REFERENCE TABLE
R0106 SUMMARY OF SYMBOL TABLE LISTINGS
R0107 MEMORY TYPE & AVAILABILITY DISPLAY
R0108 COUNT TABLE
R0109 PARAGRAPHS GENERATED FOR THIS ASSEMBLY
R0110 OCTAL LISTING
R0111 OCCUPIED LOCATIONS TABLE
R0112 SUBROUTINES CALLED & PROGRAM STATUS

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P0113 VERB LIST FOR LUMINARY

R0114 REGULAR VERBS

R0115 00 NOT IN USE

R0116 01 DISPLAY OCTAL COMP 1 IN R1

R0117 02 DISPLAY OCTAL COMP 2 IN R1

R0118 03 DISPLAY OCTAL COMP 3 IN R1

R0119 04 DISPLAY OCTAL COMP 1,2 IN R1,R2

R0120 05 DISPLAY OCTAL COMP 1,2,3 IN R1,R2,R3

R0121 06 DISPLAY DECIMAL IN R1 OR R1,R2 OR R1,R2,R3

R0122 07 DISPLAY CP DECIMAL IN R1,R2 (TEST ONLY)

R0123 08

R0124 09

R0125 10

R0126 11 MONITOR OCTAL COMP 1 IN R1

R0127 12 MONITOR OCTAL COMP 2 IN R1

R0128 13 MONITOR OCTAL COMP 3 IN R1

R0129 14 MONITOR OCTAL COMP 1,2 IN R1,R2

R0130 15 MONITOR OCTAL COMP 1,2,3 IN R1,R2,R3

R0131 16 MONITOR DECIMAL IN R1 OR R1,R2 OR R1,R2,R3

R0132 17 MONITOR CP DECIMAL IN R1,R2 (TEST ONLY)

R0133 18

R0134 19

R0135 20

R0136 21 LOAD COMPONENT 1 INTO R1

R0137 22 LOAD COMPONENT 2 INTO R2

R0138 23 LOAD COMPONENT 3 INTO R3

R0139 24 LOAD COMPONENT 1,2 INTO R1,R2

R0140 25 LOAD COMPONENT 1,2,3 INTO R1,R2,R3

R0141 26

R0142 27 DISPLAY FIXED MEMORY

R0143 28

R0144 29

R0145 30 REQUEST EXECUTIVE

R0146 31 REQUEST WAITLIST

R0147 32 RECYCLE PROGRAM

R0148 33 PROCEED WITHOUT DSKY INPUTS

R0149 34 TERMINATE FUNCTION

R0150 35 TEST LIGHTS

R0151 36 REQUEST FRESH START

R0152 37 CHANGE PROGRAM (MAJOR MODE)

R0153 38

R0154 39

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R0155 EXTENDED VERBS
R0156 40 ZERO CDU-S
R0157 41 COARSE ALIGN CDU-S
R0158 42 FINE ALIGN IMU
R0159 43 LOAD IMU ATT ERROR METERS
R0160 44 TERMINATE RR CONTINUOUS DESIGNATE (V41N72 OPTION 2)
R0161 45
R0162 46
R0163 47 INITIALIZE AGS (R47)
R0164 48 REQUEST CAP DATA LOAD ROUTINE (R03)
R0165 49 REQUEST CREW DEFINED MANEUVER ROUTINE (R62)
R0166 50 PLEASE PERFORM
R0167 51
R0168 52 MARK X-RETICLE
R0169 53 MARK Y-RETICLE
R0170 54 MARK X OR Y-RETICLE
R0171 55 INCREMENT AGC TIME (DECIMAL)
R0172 56 TERMINATE TRACKING (R20 + R25)
R0173 57 PERMIT LANDING RADAR UPDATES
R0174 58 INHIBIT LANDING RADAR UPDATES
R0175 59 COMMAND LR TO POSITION 2.
R0176 60 DISPLAY VEHICLE ATTITUDE RATES ON FCAI ERROR NEEDLES.
R0177 61 DISPLAY CAP FOLLOWING ATTITUDE ERRORS.
R0178 62 DISPLAY TOTAL ATTITUDE ERRORS WITH RESPECT TO ACUA 22.
R0179 63 SAMPLE RADAR ONCE PER SECOND (R04).
R0180 64 REQUEST S-RANGE ANTENNA ROUTINE (R05)
R0181 65 DISABLE U AND V JET FIRINGS DURING DPS BURNS.
R0182 66 VEHICLES ARE ATTACHED. MOVE THIS VEHICLE STATE TO OTHER VEHICLE.
R0183 67 DISPLAY W MATRIX
R0184 68
R0185 69 CAUSE RESTART
R0186 70 UPDATE LIFTOFF TIME
R0187 71 UNIVERSAL UPDATE-BLOCK ADR
R0188 72 UNIVERSAL UPDATE-SINGLE ADR
R0189 73 UPDATE AGC TIME (CCTAL)
R0190 74 INITIALIZE FRASABLE PUMP VIA DOWNLINK
R0191 75 ENABLE U AND V JET FIRINGS DURING DPS BURNS.
R0192 76 MINIMUM IMPULSE COMMAND MODE
R0193 77 RATE COMMAND AND ATTITUDE HOLD MODE
R0194 78 LP SPURIOUS RETURN TEST START (R77)
R0195 79 LP SPURIOUS RETURN TEST STOP
R0196 80 UPDATE LFM STATE VECTOR
R0197 81 UPDATE CSM STATE VECTOR
R0198 82 REQUEST ORBIT PARAM DISPLAY (R30)
R0199 83 REQUEST PEND PARAM DISPLAY (R31)
R0200 84
R0201 85 DISPLAY PR LCS AZ AND ELEV
R0202 86
R0203 87

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R0204 89
R0205 89 REQUEST RENDEZVOUS FINAL ATTITUDE ROUTINE (R63)
R0206 90 REQUEST RENDEZVOUS OUT OF PLANE DISPLAY ROUTINE (R36)
R0207 91 DISPLAY BANK SLM
R0208 92 OPERATE IMU PERFORMANCE TEST (P17)
R0209 93 ENABLE W MATRIX INITIALIZATION
R0210 94
R0211 95 NO UPDATE OF EITHER STATE VECTOR (P20 OR P22)
R0212 96 INTERRUPT INTEGRATION AND GO TO FCC
R0213 97 PERFORM ENGINE FAIL PROCEDURE
R0214 98
R0215 99 PLEASE ENABLE ENGINE

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R0216 IN THE FOLLOWING NOUN LIST THE :NO LOAE: RESTRICTION MEANS THE NOUN
 R0217 CONTAINS AT LEAST ONE COMPONENT WHICH CANNOT BE LOADED, I.E. OF
 R0218 SCALE TYPE L (MIN/SEC), FF (2 INTEGERS) OR TT (LANDING RADAR POSITION).
 R0219 IN THIS CASE VERBS 24 AND 25 ARE NOT ALLOWED, BUT VERBS 21, 22 OR 23
 R0220 MAY BE USED TO LOAD ANY OF THE NOUN'S COMPONENTS WHICH ARE NOT OF THE
 R0221 ABOVE SCALE TYPES.
 R0222 THE :DEC ONLY: RESTRICTION MEANS ONLY DECIMAL OPERATION IS ALLOWED IN
 R0223 EVERY COMPONENT IN THE NOUN. (NOTE THAT :NO LOAE: IMPLIES :DEC ONLY:.)

R0224	NORMAL NOUNS	COMPONENTS	SCALE AND DECIMAL POINT	RESTRICTIONS
R0226	00 NOT IN USE			
R0227	01 SPECIFY MACHINE ADDRESS (FRACTIONAL)	3CCMP	.XXXXX FOR EACH	
R0228	02 SPECIFY MACHINE ADDRESS (WHOLE)	3CCMP	XXXXX. FOR EACH	
R0229	03 SPECIFY MACHINE ADDRESS (DEGREES)	3CCMP	XXX.XX DEG FOR EACH	
R0230	04 ANGULAR ERROR/DIFFERENCE	1CCMP	XXX.XX DEG	
R0231	05 ANGULAR ERROR/DIFFERENCE	1CCMP	XXX.XX DEG	
R0232	06 OPTION CODE	3CCMP	OCTAL ONLY FOR EACH	
R0233	LOADING NOUN 07 WILL SET OR RESET SELECTED BITS IN ANY FRASABLE REGISTER			
R0234	07 FCADR OF WORD TO BE MODIFIED	3CCMP	OCTAL ONLY FOR EACH	
R0235	ONES FOR BITS TO BE MODIFIED			
R0236	1 TO SET OR 0 TO RESET SELECTED BITS			
R0237	08 ALARM DATA	3CCMP	OCTAL ONLY FOR EACH	
R0238	09 ALARM CODES	3CCMP	OCTAL ONLY FOR EACH	
R0239	10 CHANNEL TO BE SPECIFIED	1CCMP	OCTAL ONLY	
R0240	11 TIC OF CST	3CCMP	00000. HRS	DEC ONLY
R0242			00000. MIN	MUST LOAD 3 COMPS
R0244			000.00 SEC	
R0245	12 OPTION CODE	2CCMP	OCTAL ONLY FOR EACH	
R0246	(USED BY EXTENDED VERBS ONLY)			
R0247	13 TIC OF CDF	3CCMP	00000. HRS	DEC ONLY
R0249			00000. MIN	MUST LOAD 3 COMPS
R0251			000.00 SEC	
R0252	14 CHECKLIST	3CCMP	XXXXX. FOR EACH	
R0253	(USED BY EXTENDED VERBS ONLY)			
R0254	(NOUN 25 IS PASTED AFTER DISPLAY)			
R0255	15 INCREMENT MACHINE ADDRESS	1CCMP	OCTAL ONLY	
R0256	16 TIME OF EVENT	3CCMP	00000. HRS	DEC ONLY
R0258	(USED BY EXTENDED VERBS ONLY)		00000. MIN	MUST LOAD 3 COMPS
R0260			000.00 SEC	
R0261	17 SPARE			
R0262	18 ALTIC MANUEVER BALL ANGLES	3CCMP	XXX.XX DEG FOR EACH	
R0263	19 SPARE			
R0264	20 ICDU ANGLES	3CCMP	XXX.XX DEG FOR EACH	
R0265	21 PIPAS	3CCMP	XXXXX. PULSES FOR EACH	
R0267	22 NEW ICDU ANGLES	3CCMP	XXX.XX DEG FOR EACH	
R0268	23 SPARE			
R0269	24 DELTA TIME FOR AGC CLOCK	3CCMP	00000. HRS	DEC ONLY
R0271			00000. MIN	MUST LOAD 3 COMPS
R0273			000.00 SEC	

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R0274	25	CHECKLIST	3CCMP	XXXXX. FOR EACH	
R0275		(USED WITH PLEASE PERFORM ONLY)			
R0276	26	PRIORITY/DELAY, ADRES, BECON	3CCMP	OCTAL ONLY FOR EACH	
R0277	27	SELF TEST ON/OFF SWITCH	1CCMP	XXXXX.	
R0278	28	SPARE			
R0279	29	SPARE			
R0280	30	SPARE			
R0281	31	SPARE			
R0282	32	TIME FROM PERIGEE	3CCMP	00XXX. HRS	DEC ONLY
R0284				000XX. MIN	MUST LOAD 3 COMPS
R0286				0XX.XX SEC	
R0287	33	TIME OF IGNITION	3CCMP	00XXX. HRS	DEC ONLY
R0289				000XX. MIN	MUST LOAD 3 COMPS
R0291				0XX.XX SEC	
R0292	34	TIME OF EVENT	3CCMP	00XXX. HRS	DEC ONLY
R0294				000XX. MIN	MUST LOAD 3 COMPS
R0296				0XX.XX SEC	
R0297	35	TIME FROM EVENT	3CCMP	00XXX. HRS	DEC ONLY
R0299				000XX. MIN	MUST LOAD 3 COMPS
R0301				0XX.XX SEC	
R0302	36	TIME OF AGC CLOCK	3CCMP	00XXX. HRS	DEC ONLY
R0304				000XX. MIN	MUST LOAD 3 COMPS
R0306				0XX.XX SEC	
R0307	37	TIME OF TPI	3CCMP	00XXX. HRS	DEC ONLY
R0309				000XX. MIN	MUST LOAD 3 COMPS
R0311				0XX.XX SEC	
R0312	38	TIME OF STATE BEING INTEGRATED	3CCMP	00XXX. HRS	DEC ONLY
R0314				000XX. MIN	MUST LOAD 3 COMPS
R0316				0XX.XX SEC	
R0317	39	SPARE			

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PD319	MIXED NOUNS	COMPONENTS	SCALE AND DECIMAL POINT	RESTRICTIONS
R0320	41 TIME FROM IGNITION/CUTOFF	3CCMP	XXBXX MIN/SEC	NO LOAD, DEC ONLY
R0322	VS,		XXXX.X FT/SEC	
R0323	FFILTA V (ACCUMLATED)		XXXX.X FT/SEC	
R0324	41 TARGET AZIMUTH,	2CCMP	XXX.XX DEG	(FOR SYSTEM TEST)
R0326	ELEVATION		XX.XXX DEG	
R0327	42 APOGEE,	3CCMP	XXXX.X NAUT MI	DEC ONLY
R0329	PERIGEE,		XXXX.X NAUT MI	
R0330	DELTA V (EQUIPED)		XXXX.X FT/SEC	
R0331	43 LATITUDE,	3CCMP	XXX.XX DEG	DEC ONLY
R0333	LONGITUDE,		XXX.XX DEG	
R0334	ALTITUDE		XXXX.X NAUT MI	
R0335	44 APOGEE,	3CCMP	XXXX.X NAUT MI	NO LOAD, DEC ONLY
R0337	PERIGEE,		XXXX.X NAUT MI	
R0338	TFE		XXBXX MIN/SEC	
R0339	45 MARKS,	3CCMP	XXXXX.	NO LOAD, DEC ONLY
R0341	TFI OF NEXT BLRN		XXBXX MIN/SEC	
R0342	MCA		XXX.XX DEG	
R0343	46 AUTOPILOT CONFIGURATION	1CCMP	CCTAL ONLY	
R0344	47 LEM WEIGHT,	2CCMP	XXXXX. LBS	DEC ONLY
R0346	CSM WEIGHT		XXXXX. LBS	
R0347	48 GIMBAL PITCH TRIM,	2CCMP	XXX.XX DEG	DEC ONLY
R0349	GIMBAL ROLL TRIM		XXX.XX DEG	
R0350	49 DELTA R,	3CCMP	XXXX.X NAUT MI	DEC ONLY
R0352	DELTA V,		XXXX.X FT/SEC	
R03521	RADAR DATA SOURCE CODE		XXXXX.	
R0353	50 SPARE			
R0354	51 S-BAND ANTENNA ANGLES PITCH	2CCMP	XXX.XX DEG	DEC ONLY
R0356	YAW		XXX.XX DEG	
R0357	52 CENTRAL ANGLE OF ACTIVE VEHICLE	1CCMP	XXX.XX DEG	
R0358	53 SPARE			
R0359	54 RANGE,	3CCMP	XXX.XX NAUT MI	DEC ONLY
R0361	RANGE RATE,		XXXX.X FT/SEC	
R0362	TFEFA		XXX.XX DEG	
R0363	55 NO. OF APSIDAL CROSSINGS	3CCMP	XXXXX.	DEC ONLY
R0365	ELEVATION ANGLE		XXX.XX DEG	
R0366	CENTRAL ANGLE OF PASSIVE VEHICLE		XXX.XX DEG	
R0367	56 RR LOS AZIMUTH	2CCMP	XXX.XX DEG	
R0368	ELEVATION		XXX.XX DEG	
R0369	57 SPARE			
R0371	58 PERIGEE ALT (POST TPI)	3CCMP	XXXX.X NAUT MI	DEC ONLY
R0373	DELTA V TPI		XXXX.X FT/SEC	
R0374	DELTA V TPF		XXXX.X FT/SEC	
R0375	59 DELTA VELOCITY LOS	3CCMP	XXXX.X FT/SEC FOR EA.	DEC ONLY
R0377	60 HORIZONTAL VELOCITY	3CCMP	XXXX.X FT/SEC	DEC ONLY
R0379	ALTITUDE RATE		XXXX.X FT/SEC	
R0380	COMPUTED ALTITUDE		XXXXX. FEET	
R0381	61 TIME TO GO IN BRAKING PHASE	3CCMP	XXEXX MIN/SEC	NO LOAD, DEC ONLY
R0383	TIME FROM IGNITION		XXBXX MIN/SEC	

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R0384		CROSS RANGE DISTANCE		XXXX.X NAUT MI	
R0385	62	ABSOLUTE VALUE OF VELOCITY	3CCMP	XXXX.X FT/SEC	NO LOAD, DEC ONLY
R0387		TIME FROM IGNITION		XXBXX MIN/SEC	
R0388		DELTA V (ACCUMULATED)		XXXX.X FT/SEC	
R0389	63	ABSOLUTE VALUE OF VELOCITY	3CCMP	XXXX.X FT/SEC	DEC ONLY
R0391		ALTITUDE RATE		XXXX.X FT/SEC	
R0392		COMPLETED ALTITUDE		XXXXX. FEET	
R0393	64	TIME LEFT FOR REDESIGNATION- LPD ANGLE	3CCMP	XXBXX	NO LOAD, DEC ONLY
R0395		ALTITUDE RATE		XXXXX. FT/SEC	
R0396		COMPUTED ALTITUDE		XXXXX. FEET	
R0397	65	SAMPLED AGC TIME	3CCMP	00XXX. HRS	DEC ONLY
R0399		(FETCHED IN INTERRUPT)		000XX. MIN	MUST LOAD 3 CCMPs
R0401				0XX.XX SEC	
R0402	66	LR RANGE	2CCMP	XXXXX. FEET	NO LOAD, DEC ONLY
R0404		POSITION		+0000X	
R0405	67	LRVX	3CCMP	XXXXX. FT/SEC	
R0406		LRVY		XXXXX. FT/SEC	
R0407		LRVZ		XXXXX. FT/SEC	
R0408	68	SLANT RANGE TO LANDING SITE	3CCMP	XXXX.X NAUT MI	NO LOAD, DEC ONLY
R0410		TIME TO GO IN BRAKING PHASE		XXBXX MIN/SEC	
R0411		LR ALTITUDE - COMPLETED ALTITUDE		XXXXX. FEET	
R0412	69	LANDING SITE CORRECTION, Z-COMPONENT	3CCMP	XXXXX. FEET	DEC ONLY
R04121		LANDING SITE CORRECTION, Y-COMPONENT		XXXXX. FEET	
R04122		LANDING SITE CORRECTION, X-COMPONENT		XXXXX. FEET	
R0413	70	ACT DETENT CODE/STAR CODE	3CCMP	00000 ONLY FOR EACH	
R0414	71	ACT DETENT CODE/STAR CODE	3CCMP	00000 ONLY FOR EACH	
R0415	72	RR 360 - TRUNION ANGLE	2CCMP	XXX.XX DEG	
R0416		SHAFT ANGLE		XXX.XX DEG	
R0417	73	NEW RP 360 - TRUNION ANGLE	2CCMP	XXX.XX DEG	
R0418		SHAFT ANGLE		XXX.XX DEG	
R0419	74	TIME FROM IGNITION	3CCMP	XXBXX MIN/SEC	NO LOAD, DEC ONLY
R0421		YAW AFTER VEHICLE RISE		XXX.XX DEG	
R0422		PITCH AFTER VEHICLE RISE		XXX.XX DEG	
R0423	75	DELTA ALTITUDE COH	3CCMP	XXXXX. NAUT MI	NO LOAD, DEC ONLY
R0425		DELTA TIME (COH-CST OR TPI-COH)		XXBXX MIN/SEC	
R0426		DELTA TIME (TPI-COH OR TPI-NCMTFI)		XXBXX MIN/SEC	
R0427	76	DESIRED HORIZONTAL VELOCITY	3CCMP	XXXXX. FT/SEC	DEC ONLY
R0429		DESIRED RADIAL VELOCITY		XXXXX. FT/SEC	
R04291		CROSS-RANGE DISTANCE		XXXXX. NAUT MI	
R0430	77	TIME TO ENGINE CUTOFF	2CCMP	XXBXX MIN/SEC	NO LOAD, DEC ONLY
R0432		VELOCITY NORMAL TO CSN PLANE		XXXXX. FT/SEC	
R0433	78	RR RANGE	3CCMP	XXX.XX NAUT MI	NO LOAD, DEC ONLY
R0434		RANGE RATE		XXXXX. FT/SEC	
R04341		TIME FROM IGNITION		XXBXX MIN/SEC	
R0435	79	CURSOP ANGLE	3CCMP	XXX.XX DEG	DEC ONLY
R0437		SPIRAL ANGLE		XXX.XX DEG	
R0438		POSITION CODE		XXXXX.	
R0439	80	DATA INDICATOR,	2CCMP	XXXXX.	
R0440		OMEGA		XXX.XX DEG	
R0441	81	DELTA V (IV)	3CCMP	XXXXX. FT/SEC FOR EACH	DEC ONLY

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R0443	E2	DELTA V (LV)	3CCMP	XXXX.X FT/SEC FOR EACH	DEC ONLY
R0445	R3	DELTA V (BODY)	3CCMP	XXXX.X FT/SEC FOR EACH	DEC ONLY
R0447	R4	DELTA V (OTHER VEHICLE)	3CCMP	XXXX.X FT/SEC FOR EACH	DEC ONLY
R0449	R5	VG (BODY)	3CCMP	XXXX.X FT/SEC FOR EACH	DEC ONLY
R0451	R6	VG (LV)	3CCMP	XXXX.X FT/SEC FOR EACH	DEC ONLY
R0453	E7	BACKLIP OPTICS LOS AZIMUTH	2CCMP	XXX.XX DEG	
R0454		ELEVATION		XXX.XX DEG	
R0455	88	HALF UNIT SUN OR PLANET VECTOR	3CCMP	.XXXXX FOR EACH	DEC ONLY
R0457	89	LANDMARK LATITUDE	3CCMP	XX.XXX DEG	DEC ONLY
R0459		LONGITUDE/2		XX.XXX DEG	
R0460		ALTITUDE		XXX.XX NALT MI	
R0461	90	Y	3CCMP	XXX.XX NM	DEC ONLY
R0463		Y DOT		XXXX.X FPS	
R0464		PSI		XXX.XX DEG	
R0465	91	ALTITUDE	3CCMP	XXXXXB. NALT MI	
R04651		VELOCITY		XXXXX. FT/SEC	
R04652		FLIGHT PATH ANGLE		XXX.XX DEG	
R0466	92	SPARE			
R0467	93	DELTA GYRO ANGLES	3CCMP	XX.XXX DEG FOR EACH	
R0468	94	SPARE			
R0469	95	SPARE			
R0470	96	SPARE			
R0471	97	SYSTEM TEST INPUTS	3CCMP	XXXXX. FOR EACH	
R0472	98	SYSTEM TEST RESULTS AND INPUTS	3CCMP	XXXXX.	
R0473				.XXXXX	
R0474				XXXXX.	
R0475	99	RMS IN POSITION	3CCMP	XXXXX.FT	DEC ONLY
R0477		RMS IN VELOCITY		XXXX.X FT/SEC	
R04771		RMS IN RIAS		XX.XXX RADIAN	

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R0478 REGISTERS AND SCALING FOR NORMAL NOUNS

R0479 NOUN REGISTER SCALE TYPE

R0480 00 NOT IN USE

R0481 01 SPECIFY ADDRESS B

R0482 02 SPECIFY ADDRESS C

R0483 03 SPECIFY ADDRESS D

R0484 04 DSPTFM1 F

R0485 05 DSPTFM1 F

R0486 06 OPTICN1 A

R0487 07 XREG A

R0488 08 AIMCABP A

R0489 09 FAILREG A

R0490 10 SPECIFY CHANNEL A

R0491 11 TCST K

R0492 12 OPTICMX A

R0493 13 TCDF K

R0494 14 DSPTFMX C

R0495 15 INCREMENT ADDRESS A

R0496 16 DSPTFMX C

R0497 17 SPARE

R0498 18 FCAIX D

R0499 19 SPARE

R0500 20 CDUX D

R0501 21 PTPAX C

R0502 22 THETA D

R0503 23 SPARE

R0504 24 DSPTFM2 +1 K

R0505 25 DSPTFM1 C

R0506 26 DSPTFM1 A

R0507 27 SMODE C

R0508 28 SPARE

R0509 29 SPARE

R0510 30 SPARE

R0511 31 SPARE

R0512 32 -TFR K

R0513 33 TIG K

R0514 34 DSPTFM1 K

R0515 35 TTCGC K

R0516 36 TIME2 K

R0517 37 TTPI K

R0518 38 TET K

R0519 39 SPARE

L ASSEMBLY AND OPERATION INFORMATION

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R0521 REGISTERS AND SCALING FOR MIXED NCUNS

R0521	NCUN	CCMP	REGISTER	SCALE TYPE
-------	------	------	----------	------------

R0522	40	1	TTGCG	L
-------	----	---	-------	---

R0523		2	VCDISP	S
-------	--	---	--------	---

R0524		3	DVICTAL	S
-------	--	---	---------	---

R0525	41	1	DSPTM1	D
-------	----	---	--------	---

R0526		2	DSPTM1 +1	E
-------	--	---	-----------	---

R0527	42	1	HAPC	G
-------	----	---	------	---

R0528		2	HFPF	G
-------	--	---	------	---

R0529		3	VCDISP	S
-------	--	---	--------	---

R0530	43	1	LAT	H
-------	----	---	-----	---

R0531		2	LONG	H
-------	--	---	------	---

R0532		3	ALT	G
-------	--	---	-----	---

R0533	44	1	HAPCX	G
-------	----	---	-------	---

R0534		2	HFFRX	Q
-------	--	---	-------	---

R0535		3	TFF	L
-------	--	---	-----	---

R0536	45	1	TRKMKONT	C
-------	----	---	----------	---

R0537		2	TTGCG	L
-------	--	---	-------	---

R0538		3	+MGA	H
-------	--	---	------	---

R0539	46	1	MAPDTRI	A
-------	----	---	---------	---

R0540	47	1	LEMMASS	KK
-------	----	---	---------	----

R0541		2	CSMASS	KK
-------	--	---	--------	----

R0542	48	1	PITTIME	NN
-------	----	---	---------	----

R0543		2	PCILTIME	NN
-------	--	---	----------	----

R0544	49	1	R22DISP	G
-------	----	---	---------	---

R0545		2	R22DISP +2	S
-------	--	---	------------	---

R05451		3	WHCHREAD	C
--------	--	---	----------	---

R0546	51	SPARE		
-------	----	-------	--	--

R0547	51	1	ALPHASB	H
-------	----	---	---------	---

R0548		2	BFTASB	H
-------	--	---	--------	---

R0549	52	1	ACTCENT	F
-------	----	---	---------	---

R0550	53	SPARE		
-------	----	-------	--	--

R0551	54	1	RANGE	JJ
-------	----	---	-------	----

R0552		2	RRATE	S
-------	--	---	-------	---

R0553		3	PTHETA	H
-------	--	---	--------	---

R0554	55	1	NN	C
-------	----	---	----	---

R0555		2	FLEV	F
-------	--	---	------	---

R0556		3	CENTANG	H
-------	--	---	---------	---

R0557	56	1	RR-AZ	F
-------	----	---	-------	---

R0558		2	RR-FLEV	H
-------	--	---	---------	---

R0559	57	SPARE		
-------	----	-------	--	--

R0560	58	1	PSTTPI	Q
-------	----	---	--------	---

R0561		2	DELVTPI	S
-------	--	---	---------	---

R0562		3	DELVTPI	S
-------	--	---	---------	---

R0563	59	1	PVCS	S
-------	----	---	------	---

R0564		2	PVCS +2	S
-------	--	---	---------	---

R0565		3	PVCS +4	S
-------	--	---	---------	---

R0566	60	1	VHCP12	S
-------	----	---	--------	---

L ASSEMBLY AND OPERATION INFORMATION

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R0567		2	HCTDISP	S
R0568		2	HCALC1	RR
R0569	61	1	TTEDISP	L
R0570		2	TTCCG	L
R0571		3	OUTCFPLN	CC
R0572	62	1	ABVEL	S
R0573		2	TTCCG	L
R0574		3	DVTCTAI	S
R0575	63	1	ABVEL	S
R0576		2	HCTDISP	S
R0577		3	HCALC1	RR
R0578	64	1	FLANNYDSP	PP
R0579		2	HCTDISP	S
R0580		3	HCALC	RR
R0581	65	1	SAMPTIME	K
R0582		2	SAMPTIME	K
R0583		3	SAMPTIME	K
R0584	66	1	RSTACK +6	W
R0585		2	CHANNEL 33	TT
R0586	67	1	RSTACK	X
R0587		2	RSTACK +2	Y
R0588		3	RSTACK +4	Z
R0589	68	1	RANGEDSP	CC
R0590		2	TTEDISP	L
R0591		3	DELTAH	RR
R0592	69	1	DLANEZ	RR
R05921		2	DLANCY	RR
R05922		3	DLANDX	RR
R0593	70	1	ACTCODE	A
R0594		2	ACTCODE +1	A
R0595		3	ACTCODE +2	A
R0596	71	1	ACTCODE	A
R0597		2	ACTCODE +1	A
R0598		3	ACTCODE +2	A
R0599	72	1	CDUT	Ww
R0600		2	CFUS	C
R0601	73	1	TANG	Ww
R0602		2	TANG +1	D
R0603	74	1	TTCCG	L
R0604		2	YAW	H
R0605		3	PITCH	F
R0606	75	1	DIFFALT	G
R0607		2	TITOT2	L
R0608		3	T2T0T3	L
R0609	76	1	ZECTD	S
R0610		2	RDCTD	S
R06101		3	XRANGE	G
R0611	77	1	TTCCG	L
R0612		2	YFCT	S
R0613	78	1	DARRANGE	U

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EC

R0614		2	CNFRDCT	V
R06141		3	TTCITIG	L
R0615	79	1	CURSOR	D
R0616		2	SPIRAL	D
R0617		3	PCSCODE	C
R0618	80	1	DATACODD	C
R0619		2	CMFGAD	F
R0620	81	1	DFLVLVC	S
R0621		2	DFLVLVC +2	S
R0622		2	DFLVLVC +4	S
R0623	82	1	DFLVLVC	S
R0624		2	DFLVLVC +2	S
R0625		3	DFLVLVC +4	S
R0626	83	1	DELVIMU	S
R0627		2	DELVIMU +2	S
R0628		3	DELVIMU +4	S
R0629	84	1	DELVCV	S
R0630		2	DELVCV +2	S
R0631		2	DELVCV +4	S
R0632	85	1	VGBODY	S
R0633		2	VGBODY +2	S
R0634		3	VGBODY +4	S
R0635	86	1	DFLVLVC	S
R0636		2	DFLVLVC +2	S
R0637		3	DFLVLVC +4	S
R0638	87	1	AZ	C
R0639		2	FL	D
R0640	88	1	STARAD	B
R0641		2	STARAD +2	B
R0642		3	STARAD +4	B
R0643	89	1	LANDLAT	G
R0644		2	LANDLONG	C
R0645		2	LANDALT	JJ
R0646	90	1	RANGE	JJ
R0647		2	RRATE	S
R0648		3	RTFETA	F
R0649	91	1	P21ALT	G (MEMORY/100 TC DISPLAY TENS K.M.)
R06491		2	P21VEL	P
R06492		3	P21GAM	F
R0650	92		SPARE	
R0651	93	1	PGC	C
R0652		2	CCC +2	C
R0653		3	CCC +4	C
R0654	94		SPARE	
R0655	95		SPARE	
R0656	96		SPARE	
R0657	97	1	DSPTFM1	C
R0658		2	DSPTFM1 +1	C
R0659		3	DSPTFM1 +2	C
R0660	98	1	DSPTFM2	C

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R0661	2	DSPTM2 +1	E
R0662	3	DSPTM2 +2	C
R0663 99	1	WWPOS	XX
R0664	2	WWVEL	YY
R06641	2	WWBTAS	AAA

L ASSEMBLY AND OPERATION INFORMATION

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R0665 NCUN SCALES AND FORMATS

R0666 -SCALE TYPE- PRECISION

R0667	UNITS	DECIMAL FORMAT	-- AGC FORMAT
R0668	-----	-----	-----

R0669	-A-		
R0670	OCTAL	XXXXX	SP OCTAL

R0671	-B-		-14
R0672	FRACTIONAL	.XXXXX	SP BIT 1 = 2 UNITS
R0673		(MAX .99996)	

R0674	-C-		
R0675	WHOLE	XXXXX.	SP BIT 1 = 1 UNIT
R0676		(MAX 16383.)	

R0677	-D-		15
R0678	CCL DEGREES	XXX.XX DEGREES	SP BIT 1 = 360/2 DEGREES
R0679		(MAX 359.99)	(USES 15 BITS FOR MAGNITUDE AND 2-S COMP.)
R0680			

R0681	-E-		14
R0682	ELEVATION DEGREES	XX.XXX DEGREES	SP BIT 1 = 90/2 DEGREES
R0683		(MAX 89.999)	

R0684	-F-		14
R0685	DEGREES (180)	XXX.XX DEGREES	SP BIT 1 = 180/2 DEGREES
R0686		(MAX 179.99)	

R0687	-G-		
R0688	CP DEGREES(90)	XX.XXX DEGREES	DP BIT 1 OF LOW REGISTER =
R0689			28
R0690			360/2 DEGREES

R0691	-H-		
R0692	CP DEGREES (360)	XXX.XX DEGREES	DP BIT 1 OF LOW REGISTER =
R0693			28
R0694		(MAX 359.99)	360/2 DEGREES

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R0695 -K-
 R0696 TIME (HR, MIN, SEC) XXXX. HR DP BIT 1 OF LOW REGISTER =
 R0697 XXXX. MIN -2
 R0698 FXX.XX SEC 10 SEC
 R0699 (DECIMAL ONLY).
 R0700 MAX MIN COMP=59
 R0701 MAX SEC COMP=59.99
 R0702 MAX CAPACITY=745 HRS
 R0703 33 MINS
 R0704 14.55 SECS.
 R0705 WHEN LOADING, ALL 3
 R0706 COMPONENTS MUST BE
 R0707 SUPPLIED.)

R0708 -L-
 R0709 TIME (MIN/SEC) XXXXX MIN/SEC DP BIT 1 OF LOW REGISTER =
 R0710 (B IS A BLANK -2
 R0711 POSITION, DECIMAL 10 SEC
 R0712 ONLY, DISPLAY OR
 R0713 MONITOR ONLY. CANNOT
 R0714 BE LOADED.
 R0715 MAX MIN COMP=59
 R0716 MAX SEC COMP=59
 R0717 VALUES GREATER THAN
 R0718 59 MIN 59 SEC
 R0719 ARE DISPLAYED AS
 R0720 59 MIN 59 SEC.)

R0721 -M- -2
 R0722 TIME (SEC) XXX.XX SEC SP BIT 1 = 10 SEC
 R0723 (MAX 163.83)

R0724 -N-
 R0725 TIME (SEC) DP XXX.XX SEC DP BIT 1 OF LOW REGISTER =
 R0726 -2
 R0727 10 SEC

R0728 -O-
 R0729 VELOCITY 2 XXXXX. FEET/SEC DP BIT 1 OF HIGH REGISTER =
 R0730 (MAX 41964.) -7
 R0731 2 METERS/CENTI-SEC

R0732 -C-
 R0733 POSITION 4 XXXX.X NAUTICAL MILES DP BIT 1 OF LOW REGISTER =
 R0734 2 METERS

R0735 -S-
 R0736 VELOCITY 3 XXXX.X FT/SEC DP BIT 1 OF HIGH REGISTER =
 R0737 -7
 R0738 2 METERS/CENTI-SEC

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EC

R0739 -T- -2
 R0740 G XXX.XX G SP BIT 1 = 10 G
 R0741 (MAX 163.83)

R0742 -L-
 R0743 RENDEZVOUS XXX.XX NAUT MI SP USES 15 BITS FOR UNSIGNED
 R07433 RADAR RANGE (DECIMAL ONLY. MAGNITUDE.
 R07436 DISPLAY OR MONITOR BIT 1 = 9.38 FEET
 R07439 ONLY. CANNOT BE
 R0744 LOADED.)

R0745 -V-
 R0746 RENDEZVOUS XXXXX. FEET/SEC SP USES 15 BITS FOR UNSIGNED
 R07461 RADAR RANGE RATE (DECIMAL ONLY. MAGNITUDE.
 R07462 DISPLAY OR MONITOR BIT 1 = -.6278 FEET/SEC
 R07463 ONLY. CANNOT BE
 R07464 LOADED.
 R07465 BIAS OF 17000 COUNTS
 R07466 SUBTRACTED BEFORE
 R0747 DISPLAY.)

R0748 -W-
 R0749 LANDING RADAR XXXXX. FEET DP LOW ORDER BIT OF LOW ORDER
 R0750 ALTITUDE WORD = 1.079 FEET

R0751 -X-
 R0752 LANDING RADAR XXXXX. FEET/SEC DP LOW ORDER BIT OF LOW ORDER
 R0753 VELX WORD = -.6440 FEET/SEC

R0754 -Y-
 R0755 LANDING RADAR XXXXX. FEET/SEC DP LOW ORDER BIT OF LOW ORDER
 R0756 VELY WORD = 1.212 FEET/SEC

R0757 -Z-
 R0758 LANDING RADAR XXXXX. FEET/SEC DP LOW ORDER BIT OF LOW ORDER
 R0759 VELZ WORD = .8668 FEET/SEC

R0760 -AA-
 R0761 INITIAL/FINAL XXXXX. FEET DP LOW ORDER BIT OF LOW ORDER
 R0762 ALTITUDE WORD = 2.345 FEET

R0763 -BB-
 R0764 ALTITUDE RATE XXXXX. FEET/SEC SP LOW ORDER BIT = .5
 R0765 (MAX 18191.) FEET/SEC

R0766 -CC-
 R0767 FORWARD/LATERAL XXXXX. FEET/SEC SP LOW ORDER BIT = .5571
 R0768 VELOCITY (MAX 19126.) FEET/SEC

R0769 -CC-

L ASSEMBLY AND OPERATION INFORMATION

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R0770	ROTATIONAL HAND	XXXXX. DEG/SEC	SP FRACTIONAL PART OF PI RAD
R0771	CONTROLLER ANGULAR	(MAX 100044.)	4 SEC
R0772	RATES		

R0773	-EF-		
R0774	OPTICAL TRACKER	XXX.XX DEG.	DP LOW ORDER BIT OF LOW ORDER
R0775	AZIMUTH ANGLE		15
R0776			WORD = 360/2 DEGREES

R0777	-JJ-		
R0778	POSITIONS	XXX.XX NAUT MI	DP BIT 1 OF LOW REGISTER =
R0779			2 METERS

R0780	-KK-		16
R0781	WIGHT2	XXXXX. LES	SP FRACTIONAL PART OF 2 KG

R0782	-NN-		
R0783	TRIM DEGREES 2	XXX.XX DEG	SP BIT 1=.01SEC(TIME)
R0784		(MAX 132.76)	

R0785	-PP-		
R0786	2 INTEGERS	+XXEYY	DP BIT 1 OF HIGH REGISTER =
R0787		(R IS A PLANK	1 UNIT OF XX
R0788		POSITION. DECIMAL	BIT 1 OF LOW REGISTER =
R0789		ONLY, DISPLAY OR	1 UNIT OF YY
R0790		MONITOR ONLY. CANNOT	(EACH REGISTER MUST
R0791		BE LOADED.)	CONTAIN A POSITIVE INTEGER
R0792		(MAX 99899)	LESS THAN 100)

R0793	-QQ-		
R0794	POSITION7	XXXX.X NAUT MI	DP BIT 1 OF LOW REGISTER =
R0795		(MAX 9058.9)	-4
R0796			2 METERS

R0797	-RR-		
R0798	COMPUTED ALTITUDE	XXXXX. FEET	DP BIT 1 OF LOW REGISTER =
R0799			-4
R0800			2 METERS

R0801	-SS-		
R0802	DP DEGREES	XXXX.X DEGREES	DP BIT 1 OF HIGH REGISTER =
R0803			1 DEGREE

R0804	-TT-		
R0805	LANDING RADAR	+0000X	CHANNEL 33,BIT 6=ACT POSIT. 1
R0806	POSITION	(DECIMAL ONLY.	CHANNEL 33,BIT 7=ACT POSIT. 2
R0807		DISPLAY OR MONITOR	X = 1 FOR LR POSITION 1
R0808		ONLY. CANNOT BE	X = 2 FOR LR POSITION 2
R0809		LOADED.)	

R0810 -WW-

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L ASSEMBLY AND OPERATION INFORMATION

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EC

R0811 360-CTU DEGREES XXX.XX DEGREES SP BIT 1 = 360 - (360/2)
R0812 (MAX 359.99) DEGREES
R0813 (USES 15 BITS FOR MAGNI-
R0814 TUDF AND 2-S CCMP.)

R0815 -XX-
R0816 POSITION 9 XXXXX. FEET DP BIT 1 OF LOW REGISTER =
R0817 -9
R0818 2 METERS

R0819 -YY-
R0820 VELOCITY 4 XXXX.X FEET/SEC DP FRACTIONAL PART OF
R08201 (MAX 328.0) METERS/CENTI-SEC

R0821 -AAA-
R08211 RADIANS XX.XXX RADIANS DP BIT 1 OF HIGH REGISTER =
R08212 (MAX 31.999) -9
R08213 2 RADIANS

R0822 THAT-S ALL ON THE AQUAS.

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PC023 ALARM CODES FOR LUMINARY

R0824 #9 #18 #60 COLUMN

R0825 CODE * TYPE SET BY

R0827	00107	MORE THAN 5 MARK PAIRS	ACTMARK
R0828	00111	MARK MISSING	ACTMARK
R0829	00112	MARK OR MARK REJECT NOT BEING ACCEPTED	ACTMARK
R0830	00113	NO INBITS	ACTMARK
R0831	00114	MARK MADE BUT NOT DESIRED	ACTMARK
R0832	00115	NO MARKS IN LAST PAIR TO REJECT	ACTMARK
R0837	00206	ZERO ENCODE NOT ALLOWED WITH COARSE ALIGN	IMU MODE SWITCHING
R0834	00206	+ GIMBAL LOCK.	
R0835	00207	ISS TURNON REQUEST NOT PRESENT FOR 90 SEC	T4RLET
R0836	00210	IMU NOT OPERATING	IML MODE SWITCH, IML-2, R02, P51, P57
R0838	00211	COARSE ALIGN ERROR	IMU MODE SWITCH
R0839	00212	PIPA FAIL BUT PIPA IS NOT BEING USED	IML MODE SWITCH, T4RLET
R0840	00213	IMU NOT OPERATING WITH TURN-ON REQUEST	T4RUPT
R0841	00214	PROGRAM USING IMU WHEN TURNED OFF	T4RUPT
R0842	00217	EAC RETURN FROM IMUSTALL	P51, P52, P57
R0843	00220	IMU NOT ALIGNED - NO REFSMMAT	R02, R47
R0844	00401	DESIRED GIMBAL ANGLE YIELDS GIMBAL LOCK	INF ALIGN, IMU-2,
R0845			FINDCDLW
R0846	00402	FINDCDLW NOT CONTROLLING ATTITUDE	FINCCDLW
R0847	00404	TWO STARS NOT AVAILABLE IN ANY DETENT	R59, LUNAR SURFACE
R0848	00405	TWO STARS NOT AVAILABLE	P52
R0849	00421	W-MATRIX OVERFLOW	INTERV
R0850	00501	P RADAR ANTENNA OUT OF LIMITS	R23
R0851	00502	BAD RADAR GIMBAL ANGLE INPUT	V4IN72
R0852	00503	P RADAR ANTENNA DESIGNATE FAIL	P21, NCM-F IN V4IN72
R0853	00510	RADAR AUTO DISCRETE NOT PRESENT	R25
R0854	00511	LR NOT IN POSITION 2 OR REPOSITIONING	SERVICER
R0855	00514	P RR GOES OUT OF AUTO MODE WHILE IN USE	P20
R0856	00515	RR CDU FAIL DISCRETE PRESENT	R25
R0857	00520	RADAR PLPT NOT EXPECTED AT THIS TIME	RADAR READ
R0858	00521	COULD NOT READ RADAR	R20
R0859	00522	LANDING RADAR POSITION CHANGE	RADAR READ
R0860	00523	P LR ANTENNA DIDN'T ACHIEVE POSITION 2	SERVICER, V60 (NCM-F IN V60)
R0862	00525	P DELTA THETA GREATER THAN 3 DEGREES	P22
R0863	00526	P RANGE GREATER THAN 400 NAUT. MILES	P20, P22
R0864	00527	P LOS NOT IN MODE II COVERAGE WHILE ON	R21, R24
R0865		LUNAR SURFACE	
R0866		OR VEHICLE MANEUVER REQUIRED	R24 (20)
R08665	00530	P LOS NOT IN MODE 2 COVERAGE	R21
R08666		ON LUNAR SURFACE AFTER 600 SECS.	
R0867	00600	IMAGINARY ROOTS ON FIRST ITERATION	P32, P72
R0868	00601	PERIGEE ALTITUDE CSI LT PMIN1	P32, P72,
R0869	00602	PERIGEE ALTITUDE CDH LT PMIN2	P32, P72,
R0870	00603	CSI TO CDH TIME LT TMIN12	P32, P72, P33, P73

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R0871	00604	CDH TO TPI TIME LT TMIN23	P32, P72,
R0872		OR COMPUTED CDH TIME GREATER THAN INPLT TPI TIME	
R0873	00605	NUMBER OF ITERATIONS EXCEEDS LCOP MAXIMUM	P32, P72
R0874	00616	DV EXCEEDS MAXIMUM	P32, P72,
R0875	00611	NO TIG FOR GIVEN ELEV ANGLE	P34, P74
R0876	00701	ILLEGAL OPTION CODE SELECTED	P57
R0877	00777	PIPA FAIL CAUSED THE ISS WARNING	T4RLPT
R0878	01102	AGC SELF TEST ERROR	SELF CHECK
R0881	01105	DOWNLINK TOO FAST	T4RUPT
R0882	01106	UPLINK TOO FAST	T4RLPT
R0883	01107	PHASE TABLE FAILURE. ASSUME	RESTART
R0884		ERASABLE MEMORY IS SUSPECT.	RESTART
R0895	01301	ARCSIN-ARCCOS ARGUMENT TOO LARGE	INTERPRETER
R0897	01406	BAD RETURN FROM ROOTFSRS	DESCENT GUIDANCE EOS.
R0898	01407	VG INCREASING (DELTA-V ACCUMULATED	S40.8
R0899		.GT. 90 DEGREES AWAY FROM DESIRED THRUST	S40.8
R08995		VECTOR.)	S40.8
R0900	01410	UNINTENTIONAL OVERFLOW IN GUIDANCE	DESCENT GUIDANCE EOS.
R0901	01412	DESCENT IGNALG NOT CONVERGING	P63
R0905	01520	V37 REQUEST NOT PERMITTED AT THIS TIME	V37
R0906	01600	OVERFLOW IN DRIFT TEST	IML 4
R0907	01601	BAD IML TORQUE	OPT PRE ALIGN CALIB
R0908	01601		IML 4 (LFM)
R0909	01703	IGNITION TIME SLIPPED	MITCAVE
R0910	01706	INCORRECT PROGRAM REQUESTED FOR VEHICLE	
R0911		CONFIGURATION	P40, P42
R0913	02001	JET FAILURES HAVE DISABLED Y-Z TRANS.	DAP
R0914	02002	JET FAILURES HAVE DISABLED X TRANSLATION	DAP
R0915	02003	JET FAILURES HAVE DISABLED P-ROTATION	DAP
R0916	02004	JET FAILURES HAVE DISABLED U-V ROTATION	DAP
R0917	03777	ICDU FAIL CAUSED THE ISS WARNING	T4RUPT
R0918	04777	ICDU, PIPA FAILS CAUSED THE ISS WARNING	T4RUPT
R0919	07777	IML FAIL CAUSED THE ISS WARNING	T4RUPT
R0920	10777	IML, PIPA FAILS CAUSED THE ISS WARNING	T4RLPT
R0921	13777	IML, ICPU FAILS CAUSED THE ISS WARNING	T4RLPT
R0922	14777	IML, ICPU, PIPA FAILS CAUSED ISS WARNING	T4RLPT

R0923 THE FOLLOWING CODES INDICATE THE MORE SERIOUS PCOD00 ABORTS THAT RESULT
 R0924 IN THE PROGRAM GOING TO FCC.

R0925	20105	AOTMARK SYSTEM IN USE	ACTMARK
R0926	20430	ACCELERATION OVERFLOW IN INTEGRATION	ORBITAL INTEGRATION
R0927	20607	NO SOLN FROM TIME-THETA OR TIME-RADIUS	TIMETHET, TIMERAC
R0928	21103	UNUSED CCS BRANCH EXECUTED	ABORT
R0929	21204	WAITLIST, VAPDELAY, FIXDELAY, OR LONGCALL	WAITLIST ROUTINES
R0930		CALLED WITH ZERO OR NEGATIVE DELTA-TIME	
R0933	21302	SORT CALLED WITH NEGATIVE ARGUMENT	INTERPRETER
R0934	21406	BAD RETURN FROM ROOTFSRS	IGNITION ALGORITHM
R0935	21501	KEYBOARD AND DISPLAY ALARM DURING	FINBALL
R0936		INTERNAL USE (NVSUP).ABORT	

L ASSEMBLY AND OPERATION INFORMATION

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R0938 THE FOLLOWING CODES INDICATE A BAILOUT ABORT THAT RESULTS IN A SOFTWARE
R0939 RESTART

R0940	31104	DELAY RCLTIME ELSY	EXEC
R0941	31201	EXECUTIVE OVERFLOW-NO VAC AREAS	EXEC
R0942	31202	EXECUTIVE OVERFLOW-NO CORE SETS	EXEC
R0943	31203	WAITLIST OVERFLOW-TOO MANY TASKS	WAITLIST
R09434	31206	SECOND JOB ATTEMPTS TO GO TO SLEEP VIA	PINBALL
R09436		KEYBOARD AND DISPLAY PROGRAM	
R0944	31207	NO VAC AREAS FOR MARKS	ACTMARK
R0945	31210	TWO PROGRAMS USING DEVICE AT SAME TIME	MODE SWITCHING
R0946	31211	ILLEGAL INTERRUPT OF EXTENDED VERR	ACTMARK
R09464	31502	TWO PPIO DISPLAYS WAITING	DSP INTRECE
R0947	32000	DAP STILL IN PROGRESS AT NEXT TIME5 RUPT	DAP

L ASSEMBLY AND OPERATION INFORMATION

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R0948 CHECKLIST CODES FOR LUMINARY

R0949 *9 *17 *26 *9 COLUMN

R0951 R1CODE ACTION TO BE EFFECTED PROGRAM

R0953 00013 KEY IN NORMAL CR GYRO TORQUE COARSE ALIGN P52

R0955 00014 PROCEED TO IMU FINE ALIGN ROUTINE R51,P63,P57

R0957 00014 ENTER TO LANDING SITE DETERMINATION (N89DISP) P57CPTICN2

R0960 00015 PERFORM CELESTIAL BODY ACQUISITION R51,P51

R0962 00062 SWITCH AGC POWER DOWN P06

R0964 00201 SWITCH RR MODE TO AUTOMATIC P20,P22,R04

R0966 00213 SWITCH GUID CONTROL TO GNC, MODE TO AUTO... P12,P42,P71

R0968 ALSO THR CONT TO AUTO P40,P63,P70

R0970 00215 PERFORM MANUAL ACQUISITION OF RR R23

R0972 00500 SWITCH LR ANTENNA TO POSITION 1 P63

R0974

R0975 SWITCH DENOTES CHANGE POSITION OF A CONSOLE SWITCH

R0976 PERFORM DENOTES START OR END OF A TASK

R0977 KEY IN DENOTES KEY IN OF DATA THRU THE DSKY

L ASSEMBLY AND OPERATION INFORMATION

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PC978 OPTION CODES FOR LUMINARY

R0979 THE SPECIFIED OPTION CODES WILL BE FLASHED IN COMPONENT R1 IN
 R0980 CONJUNCTION WITH V04N06 OR V14N12 (FOR EXTENDED VERBS) TO REQUEST THE
 R0981 ASTRONAUT TO LOAD INTO COMPONENT R2 THE OPTION HE DESIRES.

R0982 *9 *17 *52 *11 *25 COLUMN

R0984 OPTION

R0985 CODE PURPOSE INFLT FOR COMPONENT 2 PROGRAM(S) APPLICABILITY

R0987	00001	SPECIFY INU ORIENTATION	1=PREF 2=NCM 3=REFSMAT	P52	ALL
R0989			4=LAND SITE		
R0990	00002	SPECIFY VEHICLE	1=THIS 2=OTHER	P21,R30	ALL
R0992	00003	SPECIFY TRACKING ATTITUDE	1=PREFERRED 2=OTHER	R63	ALL
R0994	00004	SPECIFY PADAR	1=RR 2=LR	R04	SUNDANCE + LUMINARY
R0996	00005	SPECIFY SOP PHASE	1=FIRST 2=SECOND	F38	CLOSSELS + LUMINARY
R0998	00006	SPECIFY RR COARSE ALIGN OPTION	1=LOCKON 2=CONTINUOUS DESIG.	V41N72	SUNDANCE + LUMINARY
R1000	00010	SPECIFY ALIGNMENT MODE	0=ANY TIME 1=REFSMAT +G	P57	LUMINARY
R1002			2=TWO BODIES 3=ONE BODY + G		
R1003	00012	SPECIFY CSM ORBIT OPTION	1=NO ORBIT CHANGE 2=CHANGE	P22	LUMINARY
R1005			ORBIT TO PASS OVER LM		

L TAGS FOR RELATIVE SETLOC AND PLANK BANK CARDS

USFR'S PAGE NO. 1

EC

0001 REF 1 COUNT BANKSLM
 0002 MODULE 1 CONTAINS BANKS 0 THROUGH 5

0003		4000		BLCK	02
0004		4000	RADARFF	EQUALS	
0005		4000	FFTAG1	EQUALS	
0006		4000	FFTAG2	EQUALS	
0007		4000	FFTAG3	EQUALS	
0008		4000	FFTAG4	EQUALS	
0009		4000	FFTAG7	EQUALS	
0010		4000	FFTAG8	EQUALS	
0011		4000	FFTAG9	EQUALS	
0012		4000	FFTAG10	EQUALS	
0013		4000	FFTAG11	EQUALS	
0014		4000	FFTAG12	EQUALS	
0015		4000	FFTAG13	EQUALS	
0016	10 WORDS LEFT	5765	05765 0	BANKSUM	02
0016		5766	05766 0		

0017		6000		BLCK	03
0018		6000	FFTAG5	EQUALS	
0019		6000	FFTAG6	EQUALS	
0020	14 WORDS LEFT	7761	07761 0	BANKSUM	03
0020		7762	07762 0		

0021		00,2000		BANK	00
0022		00,2000	CLAYJCR	EQUALS	
0023	2 WORDS LEFT	00,2775	03775 1	BANKSUM	00
0023		00,2776	03776 1		

0024		01,2000		BANK	01
0025		01,2000	RFSTART	EQUALS	
0026		01,2000	LCADDAPI	EQUALS	
0027	0 WORDS LEFT	01,2000	NO NEED	BANKSUM	01

0028		04,2000		BANK	04
0029		04,2000	R02	EQUALS	
0030		04,2000	VSRB37	EQUALS	
0031		04,2000	PINBALL4	EQUALS	
0032		04,2000	CCNICS1	EQUALS	
0033		04,2000	KEYRLPT	EQUALS	
0034		04,2000	P36LM	EQUALS	
0035		04,2000	UPDATE2	EQUALS	
0036		04,2000	E/PROG	EQUALS	
00365		04,2000	ACTMARK2	EQUALS	
0037	21 WORDS LEFT	04,2752	03752 1	BANKSUM	04
0037		04,2753	03753 0		

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS

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0038		05,2000		BANK 05
0039		05,2000	FRANDRES	EQUALS
0040		05,2000	CCWNTLM	EQUALS
0041		05,2000	APCRST1	EQUALS
0042		05,2000	EPHEM1	EQUALS
00425		05,2000	ASENT3	EQUALS
00426		05,2000	ORBITAL3	EQUALS
0043	3 WORDS LEFT	05,3774	03774 0	BNKSUM 05
0043		05,3775	03775 1	

00044 MODULE 2 CONTAINS BANKS 6 THROUGH 13

0045		06,2000		BANK 06
0046		06,2000	IMLCCMP	EQUALS
0047		06,2000	T4PUP	EQUALS
0048		06,2000	RCSMENT	EQUALS
00485		06,2000	MIDCG1M	EQUALS
00486		06,2000	EARTHLOC	EQUALS
0049	5 WORDS LEFT	06,3772	03772 0	BNKSUM 06
0049		06,3773	03773 1	

0050		07,2000		BANK 07
0051		07,2000	ACTMARK1	EQUALS
0052		07,2000	MCCESW	EQUALS
00525		07,2000	ASENT2	EQUALS
0053	11 WORDS LEFT	07,3764	03764 1	BNKSUM 07
0053		07,3765	03765 0	

0054		10,2000		BANK 10
0055		10,2000	RTBCQCES	EQUALS
0056		10,2000	DISPLAYS	EQUALS
0057		10,2000	PHASETAB	EQUALS
0058		10,2000	FLESHLOC	EQUALS
00585		10,2000	SLEPTNL	EQUALS
0059	1 WORDS LEFT	10,3776	03776 1	BNKSUM 10

0060		11,2000		BANK 11
0061		11,2000	ORBITAL	EQUALS
0062		11,2000	F20PS*11	EQUALS
0063		11,2000	INTVEL	EQUALS
0065	3 WORDS LEFT	11,3774	03774 0	BNKSUM 11
0065		11,3775	03775 1	

0066		12,2000		BANK 12
0067		12,2000	CONICS	EQUALS

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS

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00675	12,2000	CRBITAL1	EQUALS	
00676	12,2000	INTPRET2	EQUALS	
0068	4 WORDS LEFT	12,3773	03773 1	BNKSUM 12
0068		12,3774	03774 0	

0069	13,2000	BANK	13	
0070	13,2000	LATLONG	EQUALS	
0071	13,2000	INTINIT	EQUALS	
0072	13,2000	LEMGEOM	EQUALS	
0073	13,2000	P76LCC	EQUALS	
0074	13,2000	ORBITAL2	EQUALS	
00745	13,2000	AFTFLCS	EQUALS	
0075	13 WORDS LEFT	13,3762	03762 1	BNKSUM 13
0075		13,3763	03763 0	

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS

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P0076 MODULE 3 CONTAINS BANKS 14 THROUGH 21

0077		14,2000		BANK 14
0078		14,2100	P50S1	EQUALS
0079		14,2000	STARTAB	EQUALS
00795		14,2000	ASENT4	EQUALS
0080	2 WORDS LEFT	14,3775	03775 1	BNKSUM 14
0080		14,3776	03776 1	

0081		15,2000		BANK 15
0082		15,2000	P50S	EQUALS
0083		15,2000	EPHEM	EQUALS
0084	15 WORDS LEFT	15,3760	03760 0	BNKSUM 15
0084		15,3761	03761 1	

0085		16,2000		BANK 16
0086		16,2000	DAPS1	EQUALS
0087	1 WORDS LEFT	16,3776	03776 1	BNKSUM 16

0088		17,2000		BANK 17
0089		17,2000	DAPS2	EQUALS
00895		17,2000	C13BANK	EQUALS
0090	1 WORDS LEFT	17,2000	NO NEED	BNKSUM 17

0091		20,2000		BANK 20
0092		20,2000	DAPS3	EQUALS
0093		20,2000	LCACCAP	EQUALS
0094	0 WORDS LEFT	20,2000	NO NEED	BNKSUM 20

0095		21,2000		BANK 21
0096		21,2000	DAPS4	EQUALS
0098		21,2000	P10	EQUALS
0099		21,2000	R11	EQUALS
0100	6 WORDS LEFT	21,3771	03771 0	BNKSUM 21
0100		21,3772	03772 0	

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS

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P0101 MODULE 4 CONTAINS BANKS 22 THROUGH 27

0102	22,2000	BANK 22
0103	22,2000	KALCMCN1 EQUALS
0104	22,2000	KALCMCN2 EQUALS
0105	22,2000	R30LEC EQUALS
0106	22,2000	RANCEZ EQUALS
01065	22,2000	SFRV2 EQUALS
01066	22,2000	LANDCNST EQUALS
0107	22,3773	03773 1
0107	22,3774	03774 0

4 WORDS LEFT

BNKSUM 22

0108	23,2000	BANK 23
0109	23,2000	POWFLITE EQUALS
0110	23,2000	POWFLIT1 EQUALS
0111	23,2000	INFLIGHT EQUALS
0112	23,2000	AOPERI EQUALS
0113	23,2000	R61 EQUALS
0114	23,2000	R62 EQUALS
0115	23,2000	INTPRET1 EQUALS
0116	23,2000	MEASTNC EQUALS
0117	23,2000	MEASINC1 EQUALS
0118	23,2000	EXTVBI EQUALS
01185	23,2000	P12A EQUALS
01186	23,2000	NORMLIZ EQUALS
01187	23,2000	ASENT7 EQUALS
01188	23,2000	RCCTPAP EQUALS
0119	23,3771	03771 0
0119	23,3772	03772 0

6 WORDS LEFT

BNKSUM 23

0120	24,2000	BANK 24
0121	24,2000	PLANTIN EQUALS
0122	24,2000	P20S EQUALS
0123	24,3776	03776 1

1 WORDS LEFT

BNKSUM 24

0124	25,2000	BANK 25
0125	25,2000	P20S1 EQUALS
0126	25,2000	P20S2 EQUALS
0127	25,2000	RACARUPT EQUALS
0128	25,2000	RRLEACIN EQUALS
0129	25,2000	R29S1 EQUALS
01295	25,2000	PLANTIN2 EQUALS
0130	25,3737	03737 1
0130	25,3740	03740 1

32 WORDS LEFT

BNKSUM 25

0131	26,2000	BANK 26
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L TACS FOR RELATIVE SETLOC AND BLANK BANK CARDS

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0132		26,2775	P20S3	EQUALS
0133		26,2776	BAWLINGS	EQUALS
0134		26,2777	MANUVER	EQUALS
0135		26,2778	MANUVER1	EQUALS
01355		26,2779	PLANTIN1	EQUALS
01356		26,2780	PLANTIN2	EQUALS
0136	2 WORDS LEFT	26,3775	03775 1	BNKSUM 26
0136		26,3776	03776 1	

0137		27,2775		BANK 27
0138		27,2776	TCF-FF	EQUALS
0139		27,2777	TCF-FF1	EQUALS
0140		27,2778	P47S1	EQUALS
0141		27,2779	VFCPT	EQUALS
0142		27,2780	ASENT1	EQUALS
01425		27,2781	SERV3	EQUALS
0143	5 WORDS LEFT	27,3772	03772 0	BNKSUM 27
0143		27,3773	03773 1	

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS

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P0144 MODULE 5 CONTAINS BANKS 30 THROUGH 35

0145	30,2000		BANK 30
0146	30,2000	LOWSUPER	EQUALS
0147	30,2000	P12	EQUALS
0148	30,2000	ASENT	EQUALS
0149	30,2000	FCDUW	EQUALS
01495	30,2000	FLCGSLB	EQUALS
01496	30,2000	VB67A	EQUALS
01497	30,2000	ASENT5	EQUALS
0150	30,3762	03762 1	BANKSLM 30
0150	30,3763	03763 0	

13 WORDS LEFT

0151	31,2000		BANK 31
0152	31,2000	FTHRCT	EQUALS
0153	31,2000	F20PS#31	EQUALS
0154	31,2000	VF67	EQUALS
0155	31,3741	03741 0	BANKSLM 31
0155	31,3742	03742 0	

20 WORDS LEFT

0156	32,2000		BANK 32
0157	32,2000	P20S4	EQUALS
0158	32,2000	F20PS#32	EQUALS
0159	32,2000	ABCRIS	EQUALS
0160	32,2000	LPS22	EQUALS
0161	32,2000	P66LEC	EQUALS
0163	32,2000	R47	EQUALS
01635	32,2000	SERV	EQUALS
0164	32,3764	03764 1	BANKSLM 32
0164	32,3765	03765 0	

11 WORDS LEFT

0165	33,2000		BANK 33
0166	33,2000	SEPVICES	EQUALS
0167	33,2000	R29/SERV	EQUALS
01675	33,2000	ASENT6	EQUALS
0168	33,3762	03762 1	BANKSLM 33
0168	33,3763	03763 0	

13 WORDS LEFT

0169	34,2000		BANK 34
0170	34,2000	ASENT8	EQUALS
0171	34,2000	P30S1	EQUALS
0172	34,2000	CSI/CCH1	EQUALS
0173	34,2000	ASCFILT	EQUALS
01735	34,2000	P12STUFF	EQUALS
01736	34,2000	SERV4	EQUALS
01737	34,2000	F20PS#34	EQUALS

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CAPDS

LSEB'S PAGE NO. 8 EC

0174	87 WORDS LEFT	34,3650	03650 1	BNKSUM 34
0174		34,3651	03651 0	

0175		35,2000		BANK 35
0176		35,2000	CSI/CDH	EQUALS
0177		35,2000	P30S	EQUALS
0178		35,2000	P40S3	EQUALS
0179		35,2000	P40S2	EQUALS
0180	33 WORDS LEFT	35,3736	03736 0	BNKSUM 35
0180		35,3737	03737 1	

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS

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P0181 MODULE 6 CONTAINS BANKS 36 THROUGH 43

0182		36,2000		BANK 36
0183		36,2000	P40S	EQUALS
0184	6 WORDS LEFT	36,3771	03771 0	BNKSUM 36
0184		36,3772	03772 0	

0185		37,2000		BANK 37
0186		37,2000	P05P06	EQUALS
0187		37,2000	IMU2	EQUALS
0188		37,2000	IML4	EQUALS
0189		37,2000	R31	EQUALS
0190		37,2000	IMCSUPER	EQUALS
0191		37,2000	SERV1	EQUALS
0192	6 WORDS LEFT	37,3771	03771 0	BNKSUM 37
0192		37,3772	03772 0	

0193		40,2000		BANK 40
0194		40,2000	PINBALL1	EQUALS
0195		40,2000	SELESLPR	EQUALS
0196		40,2000	PINSUPER	EQUALS
01965		40,2000	R31LCC	EQUALS
0197	17 WORDS LEFT	40,3756	03756 0	BNKSUM 40
0197		40,3757	03757 1	

0198		41,2000		BANK 41
0199		41,2000	PINBALL2	EQUALS
0200	28 WORDS LEFT	41,2743	03743 1	BNKSUM 41
0200		41,2744	03744 0	

0201		42,2000		BANK 42
0202		42,2000	SBAND	EQUALS
0203		42,2000	PINBALL3	EQUALS
0204	7 WORDS LEFT	42,3770	03770 1	BNKSUM 42
0204		42,3771	03771 0	

0205		43,2000		BANK 43
0206		43,2000	EXTVERBS	EQUALS
0207		43,2000	SELFCEC	EQUALS
0208	5 WORDS LEFT	43,3772	03772 0	BNKSUM 43
0208		43,3773	03773 1	

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS

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0209	REF	I		23,2523	HI6ZEROS EQUALS ZPROVECS	ZERC VECTOR ALWAYS IN HIGH MEMORY
0210	REF	I		12,2016	LC6ZEROS EQUALS ZPROVEC	ZERC VECTOR ALWAYS IN LOW MEMORY
0211	REF	I		23,2521	HIDPHALF EQUALS UNITX	
0212	REF	I		12,2014	LCDPHALF EQUALS XUNIT	
0213	REF	I		23,2512	HIDP1/4 EQUALS DP1/4TH	
0214	REF	I		04,3020	LCDP1/4 EQUALS D1/4	2DEC .25
0215	REF	2	LAST	37	23,2521	
0216	REF	I		23,2517	HIUNITX EQUALS UNITX	
0217	REF	I		23,2515	HIUNITY EQUALS UNITY	
0218	REF	2	LAST	37	12,2014	
0219	REF	I		12,2002	LCUNITX EQUALS XUNIT	2DEC .5
0220	REF	I		12,2000	LCUNITY EQUALS YUNIT	2DEC 0
0221	REF	I		12,2000	LCUNITZ EQUALS ZUNIT	2DEC C

R0221

0222	REF	I		22,3541	CELRSPL EQUALS SPLRET	CCL PGM, ALSO CALLED BY R30 IN LUMINARY
R0223	ROPR-SPECIFIC				ASSIGNS OBVIATING NEED TO CHECK COMPUTED FLAG IN	DETERMINING INTEGRATION AREA ENTRIES.
0225	REF	I		13,2735	ATOPTHIS EQUALS ATOPLEM	
0226	REF	I		13,2662	ATOPCTH EQUALS ATOPCSM	
0227	REF	I		13,3044	QTHPREC EQUALS CSMPREC	
0228	REF	I		0174	MOONTHIS EQUALS LMCONF LG	
0229	REF	I		0173	MCCNCTH EQUALS CMCONF LG	
0230	REF	I		13,2750	MCVATHIS EQUALS MCVEALEM	
0231	REF	I		12,2017	RMM = LODPMAX	
0232	REF	I		12,2021	RME = LCDPMAX1	
0233	REF	I		13,3060	THISPREC EQUALS LEMPREC	
0234	REF	2	LAST	37	23,2515	
0235	REF	I		23,2515	N81N82 EQUALS THISAXIS	FOR R31
0236	REF	I		5011	EPASIC EQUALS BITS2-10	DOWNLINK ERASABLE CUMF ID
0237	REF	I		4752	DELAYNUM EQUALS TWO	

L CONTROLLED CONSTANTS

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P0001 DPS AND APS ENGINE PARAMETERS

0002 REF 1 36,2000 SETLCC P405
 0003 36,2000 BANK
 0004 REF 1 CCUNT* \$1/P40

R0005 *** THE ORDER OF THE FOLLOWING SIX CONSTANTS MUST NOT BE CHANGED ***

0006 36,2000 01356 0 FOPS 2DEC 4.3670 B-7 9817.5 LBS FORCE IN NEWTONS
 0006 36,2001 37167 0
 0007 36,2002 00457 1 MDOTDPS 2DEC 0.1480 B-3 32.62 LBS/SEC IN KGS/CS.
 0007 36,2003 03250 0
 0008 36,2004 77777 0 DIDECCAY 2DEC -38
 0008 36,2005 77731 1
 0009 36,2006 00307 0 FAPS 2DEC 1.5569 B-7 3500 LBS FORCE IN NEWTONS
 0009 36,2007 11040 0
 0010 36,2008 00151 1 MDOTAPS 2DEC 0.05135 B-3 11.32 LBS/SEC IN KGS/CS
 0010 36,2011 05214 0
 0011 36,2012 77777 0 AIDECCAY 2DEC -1
 0011 36,2013 77765 0

R0012 ****

00122 36,2014 00004 0 100PCTTO 2DEC 38 B-17 DPS TAILOFF TIME FROM 100 PERCENT THRUST
 00122 36,2015 30000 1

R00124 ****

0013 36,2016 00026 1 FRCS4 2DEC 0.17752 B-7 400 LBS FORCE IN NEWTONS
 0013 36,2017 30605 1
 0014 36,2020 00013 0 FRCS2 2DEC 0.08896 B-7 200 LBS FORCE IN NEWTONS
 0014 36,2021 14303 1
 0015 REF 1 27,2000 SETLCC P4051
 0016 27,2000 BANK
 0017 REF 1 CCUNT* \$1/P40

R0018 *** APS IMPULSE DATA FOR P42 ****

0019 27,2000 00001 1 K1VAL 2DEC 124.55 B-23 2800 LB-SEC
 0019 27,2001 07622 0
 0020 27,2002 00000 1 K2VAL 2DEC 31.138 B-24 700 LB-SEC
 0020 27,2003 00762 1
 0021 27,2004 00030 1 K3VAL 2DEC 1.5569 B-10 FAPS (3500 LBS THRUST)
 0021 27,2005 35104 1

R0022 ****

0023 27,2006 00016 0 S40.136 2DEC .4671 B-9 .4671 M NEWTONS (CPS)
 0023 27,2007 36237 1
 0024 27,2010 35711 0 S40.136 2DEC .4671 B+1 S40.136 SHIFTED LEFT 10.
 0024 27,2011 35662 1
 0025 REF 1 27,2000 SETLCC ASENT1

1 CONTROLLED CONSTANTS

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0026		27,2012			BANK			
0027	REF	1			COUNT# 44/P70			
0028		27,2012	03631 0	(1/DV)A	2DEC	15.20 B-7	2 SECONDS WORTH OF INITIAL ASCENT	
0028		27,2013	23146 0					
A0029							STAGE ACCELERATION -- INVERTED (M/CS)	
A0030							1) PREDICATED ON A LIFTOFF MASS OF	
A0031							4869.9 KG (SNA-8-D-C27 7/11/68)	
A0032							2) PREDICATED ON A CONTRIBUTION TO VEHICLE ACCELERATION FROM RCS THRUSTERS	
A0033							EQUIV. TO 1 JET ON CONTINUOUSLY.	
A0034							CPS ENGINE THRUST IN NEWTONS / 100 CS.	
0035		27,2014	33226 1	K(1/DV)	2DEC	436.70 B-9		
0035		27,2015	14632 0					
0036		27,2016	05306 1	(AT)A	2DEC	3.2883 E-4 E9	INITIAL ASC. STG. ACCELERATION ** M/CS.	
0036		27,2017	15503 0					
A0037							ASSUMPTIONS SAME AS FOR (1/DV)A.	
0038		27,2020	26337 1	(TRUP)A	2DEC	91902 B-17	ESTIMATED BURN-UP TIME OF THE ASCENT STG	
0038		27,2021	30000 1					
A0039							ASSUMPTIONS SAME AS FOR (1/DV)A WITH THE	
A0040							ADDITIONAL ASSUMPTION THAT NET MASS-FLW	
A0041							RATE = 5.299 KG/SEC = 5.135 (APS) +	
A0042							.164 (1 RCS JET).	
0043	REF	1	30,2000		SETLCC ASSENT			
0044			30,2000		BANK			
0045	REF	1			COUNT# 44/ASENT			
0046		30,2000	02445 0	AT/RCS	2DEC	.0000785 B+10	4 JETS IN A DRY LEM	
0046		30,2001	00274 0					
0047	REF	1	33,2000		SETLCC SERVICES			
0048			33,2000		BANK			
0049	REF	1			COUNT# 44/SERV			

R0050 *** THE ORDER OF THE FOLLOWING TWO CONSTANTS MUST NOT BE CHANGED *****

0051		33,2000	41545 0	APSVFX	DEC	-3030 E-2 B-5	9942 FT/SEC IN M/CS.	
0052		33,2001	42341 1	DPSVFX	DEC*	-2.95588868E+ 1B-05*	VE (EFS) +2.95588868E+ 3	

R0053 *****

0054	REF	1	31,2000		SETLCC F2DPS*31			
0055			31,2000		BANK			
0056	REF	1			COUNT# 44/F2CPS			
0057		31,2000	00222 0	TRIMACCL	2DEC*	+3.50132708E- 5B+08*	A (T) +3.50132708E- 1	
0057		31,2001	33316 0					

L CONTROLLED CONSTANTS

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P0058 THRUSTING AND THRUST DETECTION PARAMETERS

0059 REF 2 LAST 2E 36,2000 SETLOC P40S
 0060 36,2022 BANK
 0061 REF 2 LAST 38 TO 38: 18 18% COUNT# \$\$/P40

0062 36,2022 00030 1 THRESH1 DEC 24

0063 36,2023 00014 1 THRESH3 DEC 12

0064 REF 1 4737 F1RTHROT = BIT13

0065 REF 1 6000 SETLOC F1TAG5
 0066 6000 BANK

0067 REF 1 COUNT# \$\$/P40

0068 6000 00464 1 THRESH2 DEC 308

0069 REF 1 31,2000 SETLOC F1THROT

0070 31,2002 BANK
 0071 REF 1 COUNT# \$\$/THROT

0072 31,2002 07401 0 FMAXDEC DEC + 3841 FSAT +4.81454413E+ 4

0073 31,2003 06613 0 FMAXPCS DEC + 3467 FMAX +4.34546769E+ 4

0074 31,2004 00024 1 THROTLAG DEC + 20 TAL (TH) +1.99999999E- 1

00745 31,2005 00307 0 SCALEFAC 2DEC* +7.97959872E+ 2E-16* BITPERF +7.97959872E- 2

00745 31,2006 17524 0

0075 REF 1 32,2000 SETLOC F20PS*32

0076 32,2000 BANK

0077 REF 1 COUNT# \$\$/F20PS

0078 32,2000 00044 1 DPSTHRSF DEC 36 (THRESH1 + THRESH3 FOR P63)

L CONTROLLED CONSTANTS

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P0082 LM HARDWARE-RELATED PARAMETERS

0083 REF 1 25,2000 SETLCC RADARLPT
 0084 25,2000 BANK
 0085 REF 1 CCUNT* \$\$/RRUPT

0086 25,2000 47777 0 LVELBIAS DEC -12288 LANDING RADAR BIAS FOR 153.6 KC.

0087 25,2001 00001 0 RCONTEIAS 2DEC 17000 BIAS CCUNT FOR RR RANGE RATE.
 0087 25,2002 01150 1

0088 REF 1 32,2000 SETLCC LRS22
 0089 32,2001 BANK
 0090 REF 1 CCUNT* \$\$/LRS22

0091 32,2001 70123 0 RDOTCONV 2DEC -.0019135344 B7 CONVERTS RR RDOT READING TO M/CS AT 2(7)
 0091 32,2002 40702 0
 0092 32,2003 13337 1 RANGCONV 2DEC 2.859024 E-3 CONVERTS RR RANGE READING TO M. AT 2(-29)
 0092 32,2004 10776 0
 0098 REF 2 LAST 39 33,2000 SETLCC SERVICES
 0099 33,2002 BANK
 0100 REF 2 LAST 39 TC 39: 2 2* CCUNT* \$\$/SERV

0101 33,2002 61000 0 HBEAMANT 2DEC -.4687018041 RANGE BEAM IN LR ANTENNA COORDINATES.
 0101 33,2003 71210 1
 0102 33,2004 00000 1 2DEC 0
 0102 33,2005 00000 1
 0103 33,2006 72333 1 2DEC -.1741224271
 0103 33,2007 45546 1

0104 33,2010 65363 1 HSCAL 2DEC -.3288792 SCALES 1.079 FT/BIT TO 2(22)M.
 0104 33,2011 64451 0

R0105 ***** THE SEQUENCE OF THE FOLLOWING CONSTANTS MUST BE PRESERVED *****

0106 33,2012 21241 0 VZSCAL 2DEC +.5410829105 SCALES .8668 FT/SEC/BIT TO 2(18) M/CS.
 0106 33,2013 03216 1
 0107 33,2014 30152 0 VYSCAL 2DEC +.7565672446 SCALES 1.212 FT/SEC/BIT TO 2(18) M/CS.
 0107 33,2015 23111 0
 0108 33,2016 63105 0 VXSCAL 2DEC -.4020043770 SCALES -.644 FT/SEC/BIT TO 2(18) M/CS.
 0108 33,2017 61723 1

P0109 *****

0110 33,2020 01507 1 KPIP DEC .0512 SCALES DELV TO UNITS OF 2(5) M/CS.
 0111 33,2021 00321 1 KPIP1 2DEC .0128 SCALES DELV TO UNITS OF 2(7) M/CS.
 0111 33,2022 26706 1
 0112 33,2023 00150 0 KPIP2 2DEC .0064 SCALES DELV TO UNITS OF 2(8) M/CS.
 0112 33,2024 33343 0

L CONTROLLED CONSTANTS

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0113		33,2025	02630 0	ALTCCNV	2DEC	1.399078846 E-4	CCNVETS M*2(-24) TO BIT UNITS *2(-28).
0113		33,2026	25010 1				
0114		33,2027	24402 1	APCCNV1	2DEC	656.167979 E-10	CCNV. ALTRATE COMP. TO BIT UNITS<
0114		33,2030	26003 0				
0115	REF	1	21,2000			SETLCC R10	
0116			21,2000			BANK	
0117	REF	1				CCUNT* \$\$/P10	
0118		21,2000	24402 1	APCCNV	CCT	24402	656.16797988-10 CCNV ALTRATE TO BIT UNIT
0119		21,2001	01551 1	ARTQA	DEC	.1366098 B-1	.25/2.345 B-1 4X/SEC CYCLE RATE.
0120		21,2002	21357 0	ARTQA2	DEC	.0021322 B8	(.5)/(2.345)(100)
0121		21,2003	22316 0	VELCCNV	CCT	22316	588.014 E-10 CONV VEL. TO BIT UNITS.
0122		21,2004	01507 1	KPIP1(5)	DEC	.0512	SCALES DELV TO M/CS*2(-5).
0123		21,2005	00547 1	MAXVBITS	CCT	00547	MAX. DISPLAYED VELOCITY 199.9989 FT/SEC.
0124	REF	1	20,2000			SETLCC DAPS3	
0125			20,2000			BANK	
0126	REF	1				CCUNT* \$\$/DAPAD	
0127		20,2000	01150 1	TORKJET1	DEC	.03757	550 / .2 SCALED AT (+16) 64 / 180

L CONTROLLED CONSTANTS

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P0128 PARAMETERS RELATING TO MASS, INERTIA, AND VEHICLE DIMENSIONS

0129 REF 1 05,2000 SETLOC FRANDRES
 0130 05,2000 BANK
 0131 REF 1 COUNT* \$\$/START

0132 05,2000 02357 1 FULLAPS DEC 5050 B-16 NOMINAL FULL ASCENT MASS -- 2(16) KG.

0133 REF 1 01,2000 SETLOC LCADDAPI
 0134 01,2000 BANK
 0135 REF 1 COUNT* \$\$/R03

0136 01,2000 76466 1 MINLMD DEC -2850 B-16 MIN. DESCENT STAGE MASS -- 2(16) KG.

0137 01,2001 76731 0 MINMINLM DEC -2200 B-16 MIN ASCENT STAGE MASS -- 2(16) KG.

0138 REF 1 4741 MINCSM = 81711 MIN CSM MASS (CK FOR 1/ACCS) = 9050 LBS

0139 REF 2 LAST 42 20,2000 SETLOC DAPS3
 0140 20,2001 BANK
 0141 REF 2 LAST 42 TC 43: 1 1* COUNT* \$\$/DAPAC

0142 20,2001 01046 1 LCASCENT DEC 2200 B-16 MIN ASCENT LEM MASS -- 2(16) KG.

0143 20,2002 07361 1 HIDESENT DEC 15300 B-16 MAX DESCENT LEM MASS -- 2(16) KG.

0144 20,2003 00666 1 LCDESCNT DEC 1750 B-16 MIN DESCENT STAGE (ALCNE) -- 2(16) KG.

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P0145 PHYSICAL CONSTANTS (TIME - INVARIANT)

0146	REF	1	37,2000		SETLCC IMI2	
0147			37,2000		BANK	
0148	REF	1			COUNT#	\$/PC7
0149			37,2000	07623 1	CMEG/MS	2DEC .24339048
0149			37,2001	26552 1		
0150	REF	1	22,2000		SETLCC R3DLOC	
0151			22,2000		BANK	
0152	REF	1			COUNT#	\$/P30

P0153 *** THE ORDER OF THE FOLLOWING TWO CONSTANTS MUST BE PRESERVED *****

0154			22,2000	27523 1	1/PTMLM	2DEC* .45162595 E-4 B14*
0154			22,2001	07571 0		
0155			22,2002	25014 1	1/RTMLE	2DEC* .50087529 E-5 B17*
0155			22,2003	06702 1		

R0156 *****

0157	REF	2	LAST	38	27,2000	SETLCC P4DS1
0158					27,2022	BANK
0159	REF	1				COUNT# \$\$/S40.9

0160					27,2022	55340 0	EARTHML	2DEC* -3.986032 E10 B-36*	M(31)/CS(2)
0160					27,2023	61711 0			
0165	REF	2	LAST	38	27,2000		SETLCC ASENT1		
0166					27,2024		BANK		
0167	REF	1					COUNT#	\$/P12	

0168					27,2024	00072 1	MLM(-37)	2DEC* 4.9027780 E8 E-37*	
0168					27,2025	16206 1			
0169					27,2026	00344 1	MCCNRATE	2DEC* .26616594890062991 E-7 B+19*	RAD/CS.
0169					27,2027	24331 0			
0170	REF	3	LAST	41	33,2000		SETLCC SERVICES		
0171					33,2031		BANK		
0172	REF	3	LAST	41 TO 42:	23	25*	COUNT#	\$/SERV	

R0173 *** THE ORDER OF THE FOLLOWING TWO CONSTANTS MUST BE PRESERVED *****

0174					33,2031	61377 0	-MLDT	2DEC* -7.9720645 F+12 B-44*	
0174					33,2032	55754 1			
0175					33,2033	77644 1	-MLDT1	2DEC* -9.8055560 F+10 B-44*	
0175					33,2034	65556 1			

P0176 *****

0177					33,2035	64453 1	-MLDTMLA	2DEC* -9.8055560 F+10 B-38*	
0177					33,2036	55670 0			
0178					33,2037	00002 0	RFSQ	2DEC* 40.6809913 F12 B-58*	
0178					33,2040	11777 0			

L CONTROLLED CONSTANTS

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0179					33,2041	01023 1	20J	2DEC	3.24692010 E-2		
0179					33,2042	37155 1					
0180					33,2043	00065 1	2J	2DEC	3.24692010 E-2		
0180					33,2044	06244 1					
0181	PEF	1			14,2000			SETLCC	P50S1		
0182					14,2000			BANK			
0183	REF	1						CCUNT*	\$\$/LOSAM		
0184					14,2000	26723 0	RSUBEM	2DEC	384402000 E-25		
0184					14,2001	00450 0					
0185					14,2002	00065 1	RSUBM	2DEC	1738090 E-25		
0185					14,2003	01265 1					
0186					14,2004	00302 0	RSUPF	2DEC	6378166 E-29		
0186					14,2005	24533 1					
0187					14,2006	00052 0	RDE	2DEC	.00257125		
0187					14,2007	04047 0					
0188	PEF	1			04,2000			SETLCC	CCNICS1		
0189					04,2000			BANK			
0190	REF	1						CCUNT*	\$\$/LT-LG		
0191					04,2000	00302 0	ERAD	2DEC	6373238 E-25	PAC RADIUS	
0191					04,2001	17755 0					
0192					04,2002	00065 1	504RM	2DEC	1738090 E-25	METERS E-29 (EQUATORIAL MEAN RADIUS)	
0192					04,2003	01265 1					
0193	REF	2	LAST	45	04,2000			SETLCC	CCNICS1		
0194					04,2004			BANK			
0195	PEF	1						CCUNT*	\$\$/CONIC		

RD196 *** THE ORDER OF THE FOLLOWING CONSTANTS MUST BE PRESERVED *****

0197	04,2004	22437	1	MUTABLE	2DEC*	3.986032 E10 B-36*	MUE
0198	04,2005	16367	1				
0198	04,2006	15625	1		2DEC*	.25087606 E-10 B+34*	1/MUE
0198	04,2007	21042	1				
0199	04,2010	30276	1		2DEC*	1.99650495 E5 B-18*	SQRT(MUE)
0199	04,2011	04773	0				
0200	04,2012	25004	1		2DEC*	.50087529 E-5 B+17*	1/SQRT(MUE)
0200	04,2013	06702	1				
0201	04,2014	16471	1		2DEC*	4.902778 E8 B-30*	MLM
0201	04,2015	01352	1				
0202	04,2016	21412	0		2DEC*	.203956 E-8 E+28*	1/MUM
0202	04,2017	20500	0				
0203	04,2020	25477	1		2DEC*	2.21422176 E4 B-15*	SQRT(MUM)
0203	04,2021	03267	0				
0204	04,2022	27533	1		2DEC*	.45162595 E-4 B+14*	1/SQRT(MLM)
0204	04,2023	07571	0				

R0205 *****

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0206	REF	1	13,2000		SETLCC INTINIT
0207			13,2000		BANK
0208	REF	1			COUNT* \$\$/INTIN
0209			13,2000	07112 1	CMFGMCCN 2DEC* 2.66169947 E-8 B+23*
0209			13,2001	06620 0	
0210	REF	1	13,2000		SETLCC CFBITAL2
0211			13,2002		BANK
0212	REF	1			COUNT* \$\$/OPBIT

R0213 *** THE ORDER OF THE FOLLOWING CONSTANTS MUST NOT BE CHANGED *****

0214			13,2012	27446 1	2DEC* 1.32715445 E16 B-54*	S
0214			13,2003	14620 0		
0215			13,2014	16471 1	MLM 2DEC* 4.9027790 E8 B-30*	M
0215			13,2005	01352 1		
0216			13,2016	22437 1	MUEARTH 2DEC* 3.986032 E10 B-36*	
0216			13,2007	16067 1		
0217			13,2010	00000 1	2DEC 0	
0217			13,2011	00000 1		
0218			13,2012	02302 1	J4REQ/J3 2DEC* .4991607391 E7 B-26*	
0218			13,2013	24735 0		
0219			13,2014	77651 0	2DEC -176236.02 E-25	
0219			13,2015	76237 0		
0220			13,2016	77776 1	2J3RE/J2 2DEC* -.1355426363 E5 B-27*	
0220			13,2017	53032 0		
0221			13,2020	10407 0	2DEC* .2067492316 E18 B-60*	
0221			13,2021	05344 1		
0222			13,2022	13710 0	J2REQSQ 2DEC* 1.75501139 E21 B-72*	
0222			13,2023	35320 0		
0223			13,2024	12160 0	2J2R2PL 2DEC* 9.20479048 E16 B-58*	
0223			13,2025	12124 0		

R0224 *****

0225	REF	1	27,2000		SETLCC TCF-FF1
0226			27,2000		BANK
0227	REF	1			COUNT* \$\$/TFF
0228			27,2000	24775 1	1/RTMU 2DEC* .5005750271 E-5 B17* MODIFIED EARTH MU
0228			27,2001	30424 0	
0229	REF	1	42,2000		SETLCC SBAND
0230			42,2000		BANK
0231	REF	1			COUNT* \$\$/R05
0232			42,2000	26723 0	REMDIST 2DEC 384402000 B-29 MEAN DISTANCE BETWEEN EARTH AND MCCN.
0232			42,2001	00450 0	

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P0233 PHYSICAL CONSTANTS (TIME - VARIANT)

SETLCC STARTAB

BANK

COUNT# \$\$/STARS

0236 REF 1

0237	14,2010	15262 0	2DEC	+0.8342971408 E-1	STAR 37	X
0237	14,2011	21773 1				
0238	14,2012	74130 0	2DEC	-0.2392481515 E-1	STAR 37	Y
0238	14,2013	42420 1				
0239	14,2014	70733 0	2DEC	-0.4966976975 E-1	STAR 37	Z
0239	14,2015	41533 1				
0240	14,2016	15014 0	2DEC	+0.8139832631 E-1	STAR 36	X
0240	14,2017	04650 0				
0241	14,2020	67067 1	2DEC	-0.5557243189 E-1	STAR 36	Y
0241	14,2021	60151 0				
0242	14,2022	02551 1	2DEC	+0.1691204557 E-1	STAR 36	Z
0242	14,2023	15123 0				
0243	14,2024	07210 0	2DEC	+0.4541066270 E-1	STAR 35	X
0243	14,2025	01664 1				
0244	14,2026	67276 0	2DEC	-0.5392368197 E-1	STAR 35	Y
0244	14,2027	62232 0				
0245	14,2030	13262 0	2DEC	+0.7092312789 E-1	STAR 35	Z
0245	14,2031	00563 1				
0246	14,2032	05076 0	2DEC	+0.3201817378 E-1	STAR 34	X
0246	14,2033	25561 0				
0247	14,2034	70716 0	2DEC	-0.4436021946 E-1	STAR 34	Y
0247	14,2035	40260 1				
0248	14,2036	62466 1	2DEC	-0.8370786986 E-1	STAR 34	Z
0248	14,2037	64656 0				
0249	14,2040	10652 1	2DEC	+0.5520184464 E-1	STAR 33	X
0249	14,2041	04246 0				
0250	14,2042	63235 0	2DEC	-0.7933187400 E-1	STAR 33	Y
0250	14,2043	44200 0				
0251	14,2044	73710 0	2DEC	-0.2567508745 E-1	STAR 33	Z
0251	14,2045	66231 0				
0252	14,2046	07204 0	2DEC	+0.4537196908 E-1	STAR 32	X
0252	14,2047	33712 0				
0253	14,2050	61747 1	2DEC	-0.8779508801 E-1	STAR 32	Y
0253	14,2051	72343 0				
0254	14,2052	32343 1	2DEC	+0.1527766153 E-1	STAR 32	Z
0254	14,2053	21262 0				
0255	14,2054	03237 1	2DEC	+0.2069525789 E-1	STAR 31	X
0255	14,2055	13301 1				
0256	14,2056	62000 0	2DEC	-0.8719885748 E-1	STAR 31	Y
0256	14,2057	65332 0				
0257	14,2060	70715 0	2DEC	-0.4436288486 E-1	STAR 31	Z
0257	14,2061	71267 1				
0258	14,2062	01745 0	2DEC	+0.1217293692 E-1	STAR 30	X
0258	14,2063	06477 0				
0259	14,2064	63531 0	2DEC	-0.7702732847 E-1	STAR 30	Y
0259	14,2065	75365 0				

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0260	14,2066	12010 0	2DEC	+.6259880410 B-1	STAR 30	Z
0261	14,2067	03005 1				
0261	14,2070	76146 0	2DEC	-.1124304773 B-1	STAR 29	X
0261	14,2071	77014 1				
0262	14,2072	60371 1	2DEC	-.9694934200 B-1	STAR 29	Y
0262	14,2073	75073 1				
0263	14,2074	03370 0	2DEC	+.2178116072 B-1	STAR 29	Z
0263	14,2075	12002 1				
0264	14,2076	76125 0	2DEC	-.1146237858 B-1	STAR 28	X
0264	14,2077	40037 1				
0265	14,2100	72436 0	2DEC	-.3399692557 B-1	STAR 28	Y
0265	14,2101	77062 0				
0266	14,2102	61041 0	2DEC	-.9334250333 B-1	STAR 28	Z
0266	14,2103	54164 0				
0267	14,2104	72277 0	2DEC	-.3516499609 B-1	STAR 27	X
0267	14,2105	51044 0				
0268	14,2106	62641 0	2DEC	-.6240752703 B-1	STAR 27	Y
0268	14,2107	45471 1				
0269	14,2110	70711 1	2DEC	-.4441196390 B-1	STAR 27	Z
0269	14,2111	70546 1				
0270	14,2112	67364 1	2DEC	-.5326876930 B-1	STAR 26	X
0270	14,2113	47073 0				
0271	14,2114	64425 0	2DEC	-.7160644554 B-1	STAR 26	Y
0271	14,2115	77777 0				
0272	14,2116	07157 0	2DEC	+.4511047742 B-1	STAR 26	Z
0272	14,2117	16322 0				
0273	14,2120	62327 1	2DEC	-.7861763936 B-1	STAR 25	X
0273	14,2121	64446 0				
0274	14,2122	67515 1	2DEC	-.5217996305 B-1	STAR 25	Y
0274	14,2123	55266 0				
0275	14,2124	05230 0	2DEC	+.3311371675 B-1	STAR 25	Z
0275	14,2125	25476 0				
0276	14,2126	64754 0	2DEC	-.6898393233 B-1	STAR 24	X
0276	14,2127	72604 0				
0277	14,2130	71235 0	2DEC	-.4182330640 B-1	STAR 24	Y
0277	14,2131	72553 1				
0278	14,2132	66427 0	2DEC	-.5909338474 B-1	STAR 24	Z
0278	14,2133	42171 0				
0279	14,2134	66546 0	2DEC	-.5812035376 B-1	STAR 23	X
0279	14,2135	72765 1				
0280	14,2136	73260 1	2DEC	-.2909171294 B-1	STAR 23	Y
0280	14,2137	71643 0				
0281	14,2140	14121 0	2DEC	+.7599800468 B-1	STAR 23	Z
0281	14,2141	30153 0				
0282	14,2142	61247 1	2DEC	-.9170097662 B-1	STAR 22	X
0282	14,2143	73310 1				
0283	14,2144	72313 0	2DEC	-.3502146628 B-1	STAR 22	Y
0283	14,2145	41247 0				
0284	14,2146	74744 0	2DEC	-.1908999176 B-1	STAR 22	Z
0284	14,2147	44566 1				

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0285	14,2150	70606 0	2DEC	-.4523440203 B-1	STAR 21	X
0285	14,2151	54564 1				
0286	14,2152	77153 0	2DEC	-.8493710140 B-1	STAR 21	Y
0286	14,2153	61536 0				
0287	14,2154	61601 1	2DEC	-.8904759346 B-1	STAR 21	Z
0287	14,2155	47046 0				
0288	14,2156	60604 0	2DEC	-.9525211695 B-1	STAR 20	X
0288	14,2157	76224 1				
0289	14,2160	77021 0	2DEC	-.0593434796 B-1	STAR 20	Y
0289	14,2161	73354 1				
0290	14,2162	73161 0	2DEC	-.2986331746 B-1	STAR 20	Z
0290	14,2163	63065 1				
0291	14,2164	60421 1	2DEC	-.9656605484 B-1	STAR 19	X
0291	14,2165	51702 0				
0292	14,2166	00656 1	2DEC	+.0525933156 B-1	STAR 19	Y
0292	14,2167	23012 0				
0293	14,2170	04044 0	2DEC	+.2544280809 B-1	STAR 19	Z
0293	14,2171	15627 0				
0294	14,2172	62164 0	2DEC	-.8608205219 B-1	STAR 18	X
0294	14,2173	45040 1				
0295	14,2174	07325 1	2DEC	+.4636213989 B-1	STAR 18	Y
0295	14,2175	37443 0				
0296	14,2176	03267 1	2DEC	+.2098647835 B-1	STAR 18	Z
0296	14,2177	06626 0				
0297	14,2200	63471 0	2DEC	-.7742591356 B-1	STAR 17	X
0297	14,2201	50471 0				
0298	14,2202	11660 1	2DEC	+.6152504197 B-1	STAR 17	Y
0298	14,2203	04151 0				
0299	14,2204	75501 1	2DEC	-.1482892839 B-1	STAR 17	Z
0299	14,2205	46664 1				
0300	14,2206	70430 1	2DEC	-.4657947941 B-1	STAR 16	X
0300	14,2207	46540 1				
0301	14,2210	07507 1	2DEC	+.4774785033 B-1	STAR 16	Y
0301	14,2211	20100 1				
0302	14,2212	13727 1	2DEC	+.7450164351 B-1	STAR 16	Z
0302	14,2213	05455 0				
0303	14,2214	72160 0	2DEC	-.3612508532 B-1	STAR 15	X
0303	14,2215	64202 0				
0304	14,2216	11144 0	2DEC	+.5747270840 B-1	STAR 15	Y
0304	14,2217	05203 0				
0305	14,2220	64200 1	2DEC	-.7342932655 B-1	STAR 15	Z
0305	14,2221	65331 0				
0306	14,2222	71222 1	2DEC	-.4118589524 B-1	STAR 14	X
0306	14,2223	41512 1				
0307	14,2224	16402 0	2DEC	+.9065485360 B-1	STAR 14	Y
0307	14,2225	16205 1				
0308	14,2226	01365 0	2DEC	+.0924226975 B-1	STAR 14	Z
0308	14,2227	04034 1				
0309	14,2230	75054 1	2DEC	-.1820751783 B-1	STAR 13	X
0309	14,2231	56052 0				

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0310	14,2232	17737 1	2DEC	+.9404899869 B-1	STAR 13	Y
0310	14,2233	17635 1				
0311	14,2234	72321 0	2DEC	-.2869271926 B-1	STAR 13	Z
0311	14,2235	57623 0				
0312	14,2236	77010 0	2DEC	-.0614937230 B-1	STAR 12	X
0312	14,2237	47623 0				
0313	14,2240	11515 0	2DEC	+.6031563286 B-1	STAR 12	Y
0313	14,2241	01640 1				
0314	14,2242	63215 1	2DEC	-.7952489957 B-1	STAR 12	Z
0314	14,2243	52176 0				
0315	14,2244	02143 0	2DEC	+.1371725575 B-1	STAR 11	X
0315	14,2245	26755 1				
0316	14,2246	12715 1	2DEC	+.6813721061 B-1	STAR 11	Y
0316	14,2247	31471 0				
0317	14,2250	13431 0	2DEC	+.7189685267 B-1	STAR 11	Z
0317	14,2251	31222 1				
0318	14,2252	03157 1	2DEC	+.2011399589 B-1	STAR 10	X
0318	14,2253	27524 0				
0319	14,2254	17452 1	2DEC	+.9690337941 B-1	STAR 10	Y
0319	14,2255	12312 1				
0320	14,2256	75552 1	2DEC	-.1432348512 B-1	STAR 10	Z
0320	14,2257	63657 0				
0321	14,2260	05471 0	2DEC	+.3507315038 B-1	STAR 9	X
0321	14,2261	06122 0				
0322	14,2262	16220 0	2DEC	+.8926333307 B-1	STAR 9	Y
0322	14,2263	16362 1				
0323	14,2264	04417 1	2DEC	+.2831839492 B-1	STAR 9	Z
0323	14,2265	32762 0				
0324	14,2266	06443 1	2DEC	+.4105636020 B-1	STAR 8	X
0324	14,2267	12622 1				
0325	14,2270	07766 1	2DEC	+.4988110001 B-1	STAR 8	Y
0325	14,2271	10227 0				
0326	14,2272	14154 1	2DEC	+.7632988371 B-1	STAR 8	Z
0326	14,2273	36154 1				
0327	14,2274	13200 1	2DEC	+.7032235469 B-1	STAR 7	X
0327	14,2275	31653 0				
0328	14,2276	13244 1	2DEC	+.7075846047 B-1	STAR 7	Y
0328	14,2277	21136 1				
0329	14,2300	01067 1	2DEC	+.0692868685 B-1	STAR 7	Z
0329	14,2301	23176 1				
0330	14,2302	10563 0	2DEC	+.5450107404 B-1	STAR 6	X
0330	14,2303	27227 0				
0331	14,2304	17402 0	2DEC	+.5314955466 B-1	STAR 6	Y
0331	14,2305	00275 1				
0332	14,2306	65477 0	2DEC	-.6484410356 B-1	STAR 6	Z
0332	14,2307	77044 1				
0333	14,2310	00153 0	2DEC	+.0130968840 B-1	STAR 5	X
0333	14,2311	11212 0				
0334	14,2312	00077 1	2DEC	+.0076062795 B-1	STAR 5	Y
0334	14,2313	36275 1				

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0335	14,2314	17777 0	2DEC	+.9998837600 B-1	STAR 5	Z
0335	14,2315	01417 1				
0336	14,2316	07674 0	2DEC	+.4917678276 B-1	STAR 4	X
0336	14,2317	21771 0				
0337	14,2320	03416 1	2DEC	+.2204887125 B-1	STAR 4	Y
0337	14,2321	07626 1				
0338	14,2322	62413 0	2DEC	-.8423473935 B-1	STAR 4	Z
0338	14,2323	57536 0				
0339	14,2324	07511 1	2DEC	+.4775639450 B-1	STAR 3	X
0339	14,2325	06414 0				
0340	14,2326	01673 1	2DEC	+.1166004340 B-1	STAR 3	Y
0340	14,2327	06065 1				
0341	14,2330	15735 1	2DEC	+.8708254803 B-1	STAR 3	Z
0341	14,2331	31531 1				
0342	14,2332	16745 0	2DEC	+.9342640400 B-1	STAR 2	X
0342	14,2333	17555 1				
0343	14,2334	02615 1	2DEC	+.1735073142 B-1	STAR 2	Y
0343	14,2335	13716 0				
0344	14,2336	73010 1	2DEC	-.3115219339 B-1	STAR 2	Z
0344	14,2337	40311 0				
0345	14,2340	15776 0	2DEC	+.8748658918 B-1	STAR 1	X
0345	14,2341	34660 0				
0346	14,2342	00325 0	2DEC	+.0260879174 B-1	STAR 1	Y
0346	14,2343	26625 1				
0347	14,2344	07572 0	2DEC	+.4826621670 B-1	STAR 1	Z
0347	14,2345	05115 0				
0348	14,2346	15472 1	CATALOG	DEC 6970		

R0349 *****

0350	REF	1	05,2000	SFTLCC EPHEM1
0351			05,2001	BANK
0352	REF	1		COUNT# 11/EPHEM

0353	05,2001	20000 0	KCNMAT	2DEC	1.0 B-1	*****
0353	05,2002	00000 1				
0354	05,2003	00000 1		2DEC	0	*
0354	05,2004	00000 1				
0355	05,2005	00000 1		2DEC	0	*
0355	05,2006	00000 1				
0356	05,2007	00000 1		2DEC	0	*
0356	05,2008	00000 1				
0357	05,2011	16533 0		2DEC	.91745 B-1	K1 CCS(CEL) *
0357	05,2012	30007 0				
0358	05,2013	77333 1		2DEC	-.03571 B-1	K2 SIN(CEL)SIN(IM) *
0358	05,2014	56654 0				
0359	05,2015	00000 1		2DEC	0	*
0359	05,2016	00000 1				
0360	05,2017	06273 1		2DEC	.39784 B-1	K3 SIN(CEL) *
0361	05,2020	03275 1				

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0361	05,2021	01242 1		2DEC	.082354 B-1	K4 COS(CBL)SIN(IM)	*
0361	05,2022	24467 1					
0362	05,2023	00220 0	CSTODAY	2DEC	8640000 B-33		* NOTE *
0362	05,2024	17260 0					
0363	05,2025	00002 0	RCP-13	CCT	00002		* TABLES CONTAIN *
0364	05,2026	00000 1		CCT	00000		* CONSTANTS FOR *
0365	05,2027	22572 1	RATESP	2DEC	.03660098 B+4	LCMR	* 1969 - 1970 *
0365	05,2030	27214 0					
0366	05,2031	01315 1		2DEC	.00273779 B+4	LCNR	
0366	05,2032	26177 1					
0367	05,2033	77731 1		2DEC	-.00014719 B+4	LCNR	
0367	05,2034	55217 0					
0368	05,2035	32055 0		2DEC	.815282336	LCMC	
0368	05,2036	22576 0					
0369	05,2037	10624 0		2DEC	.274674910	LCSD	
0369	05,2040	10605 0					
0370	05,2041	37436 1		2DEC	.986209499	LOND	
0370	05,2042	01635 0					
0371	05,2043	01065 0	VAL67	2DEC*	.01726666666 B+1*	AMCE	
0371	05,2044	31323 1					
0372	05,2045	20770 0		2DEC	.530784445	AMRC	
0372	05,2046	12725 0					
0373	05,2047	02245 0		2DEC	.036291712 B+1	1/27	
0373	05,2050	06475 1					
0374	05,2051	00162 1		2DEC	.003505277 B+1	BMCD	
0374	05,2052	33431 1					
0375	05,2053	22566 1		2DEC	.585365625	BARG	
0375	05,2054	24130 0					
0376	05,2055	02000 0		2DEC	.03125 B+1	1/32	
0376	05,2056	00000 1					
0377	05,2057	00256 0		2DEC	.005325277 B+1	CMOD	
0377	05,2060	17752 1					
0378	05,2061	77512 1		2DEC	-.01106341036	CARG	
0378	05,2062	67453 1					
0379	05,2063	00131 1		2DEC	.002737925 B+1	1/365	
0379	05,2064	26731 1					

0381	REF 1	26,2000		SETLCC PLANTIN2			
0382		26,2000		EANK			
0383	REF 1			CCUNT* \$\$/LURCT			
0384		26,2000	17775 1	COSI	2DEC*	9.996417320 E-1 B-1*	COS (5521.5 SEC.)
0384		26,2001	02052 1				
0385		26,2002	00323 1	SINI	2DEC*	2.676579050 E-2 E-1*	SIN (5521.5 SEC.)
0385		26,2003	10374 0				
0386		26,2004	77665 1	ACDFCT	2DEC*	-1.703706190 E-11 B28*	REV/CSEC
0386		26,2005	42175 1				
0387		26,2006	22211 0	FCOT	2DEC*	4.253263473 E-9 B27*	REV/CSEC
0387		26,2007	00626 1				

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0388	26,2010	77777 0	EECT	2DEC*	-1.145529388 E-16 B28*	REV/C SEC
0388	26,2011	77767 1				
0389	26,2012	37436 1	NODIO	2DEC*	9.862094363 E-1*	REV
0389	26,2013	01614 0				
0390	26,2014	32417 1	FSLBC	2DEC*	8.290901511 E-1*	REV
0390	26,2015	32011 0				
0391	26,2016	02052 1	BSUBC	2DEC	6.512013939 E-2	REVS
0391	26,2017	35552 0				
0392	26,2020	37116 0	WEARTH	2DEC*	1.160576171 E-7 B23*	REV/C SEC
0392	26,2021	32631 1				

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A000001
R000002

*** CHANNEL DESCRIPTIONS WORDS ARE ALLOCATED IN ERASABLE ASSIGNMENTS ***

R000005 CHANNEL 1 IDENTICAL TO COMPUTER REGISTER L (0001)
A0001R0002 CHANNEL 2 IDENTICAL TO COMPUTER REGISTER Q (0002)
A0003R0004 CHANNEL 3 HISCALAR; INPUT CHANNEL; MOST SIGNIFICANT 14 BITS FROM 33 STAGE BINARY COUNTER. SCALE
R0006 FACTOR IS 823 IN CSEC, SO MAX VALUE ABOUT 23.3 HOURS AND LEAST SIGNIFICANT BIT 5.12 SECS.
A0008R0009 CHANNEL 4 LISCALAR; INPUT CHANNEL; NEXT MOST SIGNIFICANT 14 BITS FROM THE 33 STAGE BINARY COUNTER
R0011 ASSOCIATED WITH CHANNEL 3. SCALE FACTOR IS 89 IN CSEC. SO MAX VAL IS 5.12 SEC AND LEAST
R0013 SIGNIFICANT BIT IS 1/3200 SEC. SCALE FACTOR OF D.P. WORD WITH CHANNEL 3 IS 823 CSEC.
A0015R0016 CHANNEL 5 PYJETS; OUTPUT CHANNEL; PITCH RCS JET CONTROL. (REACTION CONTROL SYSTEM) USES BITS 1-8.
A0018R0019 CHANNEL 6 POLJETS; OUTPUT CHANNEL; ROLL RCS JET CONTROL. (REACTION CONTROL SYSTEM) USES BIT 1-8.
A0021R0022 CHANNEL 7 SUPERBANK; OUTPUT CHANNEL; NOT RESET BY RESTART; FIXED EXTENSION BITS USED TO SELECT THE
R0024 APPROPRIATE FIXED MEMORY BANK IF FBANK IS 30 OCTAL OR MORE. USES BITS 5-7.
A0026R0027 CHANNEL 10 CLTC; OUTPUT CHANNEL; REGISTER USED TO TRANSMIT LATCHING-RELAY DRIVING INFORMATION FOR
R0029 THE DISPLAY SYSTEM. BITS 15-12 ARE SET TO THE ROW NUMBER (1-14 OCTAL) OF THE RELAY TO BE
R0031 CHANGED AND BITS 11-1 CONTAIN THE REQUIRED SETTINGS FOR THE RELAYS IN THE ROW.
A0033R0034 CHANNEL 11 OSALMOUT; OUTPUT CHANNEL; REGISTER WHOSE BITS ARE USED FOR ENGINE ON-OFF CONTROL AND TO
R0036 DRIVE INDIVIDUAL INDICATORS OF THE DISPLAY SYSTEM. BITS 1-7 ARE A RELAYS.A0038
R0039 BIT 1 ISS WARNING
A0040

R0041 BIT 2 LIGHT COMPUTER ACTIVITY LAMP

A0042
R0043 BIT 3 LIGHT LPLINK ACTIVITY LAMP
A0044R0045 BIT 4 LIGHT TEMP CAUTION LAMP
A0046R0047 BIT 5 LIGHT KEYBOARD RELEASE LAMP
A0048R0049 BIT 6 FLASH VERB AND AGLN LAMPS
A0050

R0051 BIT 7 LIGHT OPERATOR ERROR LAMP

L INPUT/OUTPUT CHANNEL BIT DESCRIPTIONS

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A0052 R0053 A0054	BIT 8	SPARE
R0055 A0056 R0057	BIT 9	TEST CONNECTOR CUTBIT
A0058 R0059 A0060	BIT 10	CAUTION RESET
R0061 A0062 R0063	BIT 11	SPARE
A0064 R0065 A0066	BIT 12	SPARE
R0067 A0068	BIT 13	ENGINE ON
R0069 A0071 R0072	BIT 14	ENGINE OFF
A0073 R0074 A0075	BIT 15	SPARE
R0076 A0077 R0078	CHANNEL 12	CHAN12: OUTPUT CHANNEL; BITS USED TO DRIVE NAVIGATION AND SPACECRAFT HARDWARE
A0079 R0080 A0081	BIT 1	ZERO RP CDU; CDU'S GIVE RADAR INFORMATION FOR LM
R0082 A0083 R0084	BIT 2	ENABLE CDU RADAR ERROR COUNTERS
A0085 R0086 A0087	BIT 3	NOT USED
R0088 A0089 R0090	BIT 4	COARSE ALIGN ENABLE OF IMU
A0091 R0092 A0093	BIT 5	ZERO IMU CDU'S
R0094 A0095 R0096	BIT 6	ENABLE IMU ERROR COUNTER, CDU ERROR COUNTER.
A0097 R0098 A0099	BIT 7	SPARE
R0100 A0101	BIT 8	DISPLAY INERTIAL DATA
	BIT 9	-PITCH GIMBAL TRIM (BELL MOTION) DESCENT ENGINE
	BIT 10	+PITCH GIMBAL TRIM (BELL MOTION) DESCENT ENGINE
	BIT 11	-ROLL GIMBAL TRIM (BELL MOTION) DESCENT ENGINE
	BIT 12	+ROLL GIMBAL TRIM (BELL MOTION) DESCENT ENGINE
	BIT 13	LF POSITION 2 COMMAND
	BIT 14	ENABLE RENDEZVOUS RADAR LOCK-ON;ALTC ANGLE TRACK'G
	BIT 15	ISS TURN ON DELAY COMPLETE

1 INPUT/OUTPUT CHANNEL BIT DESCRIPTIONS

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CHANNEL 13 CHAN13; OUTPUT CHANNEL

R0102			
A0103			
R0104	BIT 1	RADAR C	PROPER SETTING OF THE A,B,C MATRIX
R0105	BIT 2	RADAR B	SELECTS CERTAIN RADAR
R0106	BIT 3	RADAR A	PARAMETERS TO BE READ.
A0107			
R0108	BIT 4	RADAR ACTIVITY	
A0109			
R0110	BIT 5	NOT USED (CONNECTS AN ALTERNATE INPUT TO UPLINK)	
A0111			
R0112	BIT 6	SPARE	
A0113			
R0114	BIT 7	DOWNLINK TELEMETRY WORD ORDER CDDF BIT	
A0115			
R0116	BIT 8	RHC COUNTER ENABLE (READ HAND CONTROLLER ANGLES)	
A0117			
R0118	BIT 9	START RHC READ INTO COUNTERS IF BIT 8 SET	
A0119			
R0120	BIT 10	TEST ALARMS, TEST CSKY LIGHTS	
A0121			
R0122	BIT 11	ENABLE STANDBY	
A0123			
R0124	BIT 12	RESET TRAP 31-A	ALWAYS APPEAR TO BE SET TO 0
A0125			
R0126	BIT 13	RESET TRAP 31-B	ALWAYS APPEAR TO BE SET TO 0
A0127			
R0128	BIT 14	RESET TRAP 32	ALWAYS APPEAR TO BE SET TO 0
A0129			
R0130	BIT 15	ENABLE T6 RUPT	
A0131			

CHANNEL 14 CHAN14; OUTPUT CHANNEL; USED TO CONTROL COMPUTER COUNTER CELLS (CDU,GYRO,SPACECRAFT FUNC.

R0132			
A0134			
R0135	BIT 1	OUTLINK ACTIVITY (NOT USED)	
A0136			
R0137	BIT 2	ALTITUDE RATE OR ALTITUDE SELECTOR	
A0138			
R0139	BIT 3	ALTITUDE METER ACTIVITY	
A0140			
R0141	BIT 4	THRUST DRIVE ACTIVITY FOR DESCENT ENGINE	
A0142			
R0143	BIT 5	SPARE	
A0144			
R0145	BIT 6	GYRO ENABLE POWER FOR PULSES	
A0146			
R0147	BIT 7	GYRO SELECT B	PAIR OF BITS IDENTIFIES AXIS OF -
R0148	BIT 8	GYRO SELECT A	GYRO SYSTEM TO BE TORQUED.
A0149			
R0150	BIT 9	GYRO TORQUING COMMAND IN NEGATIVE DIRECTION	
A0151			

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R0152 BIT 10 GYRO ACTIVITY

A0153

R0154 BIT 11 DRIVE CDU S

A0155

R0156 BIT 12 DRIVE CDU T

A0157

R0158 BIT 13 DRIVE CDU Z

A0159

R0160 BIT 14 DRIVE CDU Y

A0161

R0162 BIT 15 DRIVE CDU X

A0163

R0164 CHANNEL 15 MKKEYIN; INPUT CHANNEL; KEY CODE INPUT FROM KEYBOARD OF DSKY, SENSED BY PROGRAM WHEN
 R0166 PROGRAM INTERRUPT #5 IS RECEIVED. USES BITS 5-1
 A0167

R0168 CHANNEL 16 NAVKEYIN; INPUT CHANNEL; OPTICS MARK INFORMATION AND NAVIGATION PANEL DSKY (CM) OR THRUST
 R0170 CONTROL (LM) SENSED BY PROGRAM WHEN PROGRAM INTERRUPT #6 IS RECEIVED. USES BITS 3-7 ONLY.
 A0172

R0172 BIT 1 NOT ASSIGNED

A0174

R0175 BIT 2 NOT ASSIGNED

A0176

R0177 BIT 3 OPTICS X-AXIS MARK SIGNAL FOR ALIGN OPTICAL TELESCOPE

A0178

R0179 BIT 4 OPTICS Y-AXIS MARK SIGNAL FOR ACT

A0180

R0181 BIT 5 OPTICS MARK REJECT SIGNAL

A0182

R0183 BIT 6 DESCENT+ ; CREW DESIRED SLOWING RATE OF DESCENT

A0184

R0185 BIT 7 DESCENT- ; CREW DESIRED SPEEDING UP RATE OF DESCENT

A0186

R0187 NOTE: ALL BITS IN CHANNELS 30-33 ARE INVERTED AS SENSED BY THE PROGRAM, SO THAT A VALUE OF ZERO MEANS
 R0189 THAT THE INDICATED SIGNAL IS PRESENT.
 A0190

R0191 CHANNEL 30 INPUT CHANNEL

A0192

R0193 BIT 1 ABORT WITH DESCENT STAGE

A0194

R0195 BIT 2 UNUSED

A0196

R0197 BIT 3 ENGINE ARMED SIGNAL

A0198

R0199 BIT 4 ABORT WITH ASCENT ENGINE STAGE

A0200

R0201 BIT 5 AUTO THROTTLE; COMPUTER CONTROL OF DESCENT ENGINE

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A0202 R0203 A0204	BIT 6	DISPLAY INERTIAL DATA
R0205 A0206 R0207	BIT 7	RF CDU FAIL
A0208 R0209 A0210	BIT 8	SPARE
R0211 A0212 R0213	BIT 9	IML OPERATE WITH NO MALFUNCTION
A0214 R0215 A0216	BIT 10	LM COMPUTER (NOT ACS) HAS CONTROL OF LM
R0217 A0218 R0219	BIT 11	IMU GAGE COMMAND TO DRIVE IMU GIMBAL ANGLES TO 0.
A0220 R0221 A0222	BIT 12	IMU CDU FAIL (MALFUNCTION OF IML CDU,S)
R0223 A0224 R0225	BIT 13	IML FAIL (MALFUNCTION OF IML STABILIZATION ICCPS)
A0226 R0227 A0228	BIT 14	ISS TURN ON REQUESTED
R0229 A0230 R0231	BIT 15	TEMPERATURE OF STABLE MEMBER WITHIN DESIGN LIMITS
A0232 R0233 A0234	CHANNEL 31	INPUT CHANNEL; BITS ASSOCIATED WITH THE ATTITUDE CONTROLLER, TRANSLATIONAL CONTROLLER, AND SPACECRAFT ATTITUDE CONTROL; USED BY RCS CAP
R0235 A0236 R0237	BIT 1	ROTATION (BY RHC) COMMANDED IN POSITIVE PITCH DIRECTION; MUST BE IN MINIMUM IMPULSE MODE. ALSO POSITIVE ELEVATION CHANGE FOR LANDING POINT DESIGNATOR
A0238 R0239 A0240	BIT 2	AS BIT 1 EXCEPT NEGATIVE PITCH AND ELEVATION
R0241 A0242 R0243	BIT 3	ROTATION (BY RHC) COMMANDED IN POSITIVE YAW DIRECTION; MUST BE IN MINIMUM IMPULSE MODE.
A0244 R0245 A0246	BIT 4	AS BIT 3 EXCEPT NEGATIVE YAW
R0247 A0248 R0249	BIT 5	ROTATION (BY RHC) COMMANDED IN POSITIVE ROLL DIRECTION; MUST BE IN MINIMUM IMPULSE MODE. ALSO POSITIVE AZIMUTH CHANGE FOR LANDING POINT DESIGNATOR
A0250 R0251 A0252	BIT 6	AS BIT 5 EXCEPT NEGATIVE ROLL AND AZIMUTH
R0253 A0254 R0255	BIT 7	TRANSLATION IN +X DIRECTION COMMANDED BY THC
A0256 R0257 A0258	BIT 8	TRANSLATION IN -X DIRECTION COMMANDED BY THC
R0259 A0260 R0261	BIT 9	TRANSLATION IN +Y DIRECTION COMMANDED BY THC
A0262 R0263 A0264	BIT 10	TRANSLATION IN -Y DIRECTION COMMANDED BY THC
R0265 A0266 R0267	BIT 11	TRANSLATION IN +Z DIRECTION COMMANDED BY THC
A0268 R0269 A0270	BIT 12	TRANSLATION IN -Z DIRECTION COMMANDED BY THC

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A0257
R0258 BIT 13 ATTITUDE HOLD MODE ON SCS MODE CONTROL SWITCH
A0259

R0260 BIT 14 ALTIC STABILIZATION OF ATTITUDE ON SCS MODE SWITCH
A0261

R0262 BIT 15 ATTITUDE CONTROL OUT OF DETENT (RFC NOT IN NEUTRAL)
A0263

R0264 CHANNEL 32 INPUT CHANNEL.
A0265

R0266 BIT 1 THRUSTERS 2 & 4 DISABLED BY CREW
A0267

R0268 BIT 2 THRUSTERS 5 & 8 DISABLED BY CREW
A0269

R0270 BIT 3 THRUSTERS 1 & 3 DISABLED BY CREW
A0271

R0272 BIT 4 THRUSTERS 6 & 7 DISABLED BY CREW
A0273

R0274 BIT 5 THRUSTERS 14 & 16 DISABLED BY CREW
A0275

R0276 BIT 6 THRUSTERS 13 & 15 DISABLED BY CREW
A0277

R0278 BIT 7 THRUSTERS 9 & 12 DISABLED BY CREW
A0279

R0280 BIT 8 THRUSTERS 10 & 11 DISABLED BY CREW
A0281

R0282 BIT 9 DESCENT ENGINE GIMBALS DISABLED BY CREW
A0283

A0284 BIT 10 APPARENT DESCENT ENGINE GIMBAL FAILURE
R0285

A0286 R0287 BIT 14 INDICATES PROCEED KEY IS DEPRESSED
A0288

R0289 CHANNEL 33 CHAN33: INPUT CHANNEL; FOR HARDWARE STATUS AND COMMAND INFORMATION. BITS 15-11 ARE FLIP-
R0291 FLOP BITS RESET BY A CHANNEL "WRITE" COMMAND THAT ARE RESET BY A RESTART & BY T40LPT LCCP.
A0293

R0294 BIT 1 SPARE
A0295

R0296 BIT 2 RP AUTO-POWER ON
A0297

R0298 BIT 3 RP RANGE LOW SCALE
A0299

R0300 BIT 4 RP DATA GOOD
A0301

R0302 BIT 5 LR RANGE DATA GOOD
A0303

R0304 BIT 6 LF POS1
A0305

R0306 BIT 7 LF POS2
A0307

L INPLT/CLPUT CHANNEL BIT DESCRIPTIONS

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R0308 A0309 R0310	BIT 8	LR VFL DATA GOOD
A0311 R0312 A0313	BIT 9	LR RANGE LOW SCALE
R0314 A0315 R0316	BIT 10	BLOCK UPLINK INPUT
A0317 R0318 A0319	BIT 11	UPLINK TOO FAST
R0320 A0322 R0323 A0324	BIT 12	DOWNLINK TOO FAST
R0325 R0328 A0330	BIT 13	PIPA FAIL
	BIT 14	WARNING OF REPEATED ALARMS: RESTART, COUNTER FAIL, VOLTAGE FAIL, AND SCALAR DOUBLE.
	BIT 15	LCC OSCILLATOR STOPPED
	CHANNEL 34	DMT M1; CLPUT CHANNEL; DOWNLINK 1 FIRST OF TWO WORDS SERIALIZATION.
	CHANNEL 35	DMT M2; CLPUT CHANNEL; DOWNLINK 2 SECOND OF TWO WORDS SERIALIZATION.

L FLAGWORD ASSIGNMENTS

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A0001

P0002 FLAGWORDS 0-11 ARE DOWNLINKED AND CAN BE SET AND CLEARED BY UP-FLAG AND DOWN-FLAG INSTRUCTIONS IN THE
 R0004 INTERPRETER. THESE WERE PREVIOUSLY LISTED UNDER "INTERPRETIVE SWITCH BIT ASSIGNMENTS" IN
 R0006 THE ERASABLE LCG SECTION. FLAGWORDS 12 & 13 WERE PREVIOUSLY RACMODES AND CAPBCOLS AND
 P0008 ARE STILL DOWNLINKED UNDER THOSE NAMES.

A0009

R0010 ALPHABETICAL LIST OF FLAGWORDS

R00105	9	25	41	61	COLUMN NO.
R0011	FLAGWORD	DEC. NUMBER	BIT AND FLAG	BIT NAME	
R0012	ACCSCKFLG	207	BIT 3 FLAG 12	ACCSCKAY	
R0013	ACC4-2FL	109	BIT 11 FLAG 13	ACC4OR2X	
R0014	ACMODEFLG	032	BIT 13 FLAG 2	ACMODEIT	
R0015	ALTSCALE	186	BIT 9 FLAG 12	ALTSCBIT	
R0016	ANTENFLG	183	BIT 12 FLAG 12	ANTENBIT	
R0017	AORPSFLG	065	BIT 5 FLAG 5	ACRBSYST	
R0018	ACPRTEFLG	200	BIT 10 FLAG 13	ACRBTRAN	
R0019	APSESW	130	BIT 5 FLAG 8	APSESEBIT	
R0020	APSEFLAG	152	BIT 13 FLAG 10	APSEFLBIT	
R0021	ASTNFLAG	108	BIT 12 FLAG 7	ASTNBIT	
R0022	ATTFLAG	104	BIT 1 FLAG 6	ATTFLBIT	
R0023	AUTOCODE	193	BIT 2 FLAG 12	ALTCMBIT	
R0024	ALTRIFLG	209	BIT 1 FLAG 13	AUTRATE1	
R0025	ALTP2FLG	208	BIT 2 FLAG 13	ALTRATE2	
R0026	ALXFLAG	103	BIT 2 FLAG 6	ALXFLBIT	
R0027	AVEGFLAG	115	BIT 5 FLAG 7	AVEGFBIT	
R0028	AVEMIDSW	146	BIT 1 FLAG 9	AVENCPBIT	
R0029	AVFLAG	040	BIT 5 FLAG 2	AVFLBIT	
R0030	CALCMAN2	043	BIT 2 FLAG 2	CALC2BIT	
R0031	CALCMAN3	042	BIT 3 FLAG 2	CALC3BIT	
R0032	CDESEFLAG	180	BIT 15 FLAG 12	CDESEBIT	
R0033	CMCONFLG	123	BIT 12 FLAG 8	CMCCMBIT	
R0034	CCCAFLAG	131	BIT 4 FLAG 8	CCGAERBIT	
R0037	CSMDKFLG	197	BIT 13 FLAG 13	CSMDOCKD	
R0038	CULTFLAG	052	BIT 7 FLAG 3	CULTBIT	
R0040	DAPPCCLS		FLAGWORD 13		
R0041	DBSLFLC	206	BIT 4 FLAG 13	DBSELECT	
R00411	DBSL2FLC	205	BIT 5 FLAG 13	DBSLFCT2	
R0042	DESIGFLG	185	BIT 10 FLAG 12	DESIGBIT	
R0043	DICFLAG	016	BIT 14 FLAG	DICFLBIT	
R0044	DIMJFLAG	056	BIT 1 FLAG 3	DIMCBIT	
R0045	DMENFLG	081	BIT 9 FLAG 5	DMENFEIT	
R0046	DRIFTDFL	202	BIT 8 FLAG 13	DRIFTBIT	

L FLAGWORD ASSIGNMENTS

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R0047	CPITFLG	030	BIT 15 FLAG 2	CPFTBIT
R0048	DSKYFLAG	075	BIT 15 FLAG 5	DSKYFBIT
R0049	D6CR9FLG	058	BIT 2 FLAG 3	D6CR9BIT
R0050	ENGONFLG	083	BIT 7 FLAG 5	ENGONBIT
R0051	ERADFLAG	017	BIT 13 FLAG 1	ERADFBIT
R0052	ETPIFLAG	038	BIT 7 FLAG 2	ETPIBIT
R0054	FINALFLG	039	BIT 6 FLAG 2	FINALBIT
R0056	FLAGWORD1	(000-014)	(STATE +0)	
R0057	FLAGWORD1	(015-029)	(STATE +1)	
R0058	FLAGWORD2	(030-044)	(STATE +2)	
R0059	FLAGWORD3	(045-059)	(STATE +3)	
R0060	FLAGWORD4	(060-074)	(STATE +4)	
R0061	FLAGWORD5	(075-089)	(STATE +5)	
R0062	FLAGWORD6	(090-104)	(STATE +6)	
R0063	FLAGWORD7	(105-119)	(STATE +7)	
R0064	FLAGWORD8	(120-134)	(STATE +8)	
R0065	FLAGWORD9	(135-149)	(STATE +9)	
R0066	FLAP	142	BIT 8 FLAG 9	FLAPBIT
R0067	FLCWORD10	(150-164)	(STATE +10)	
R0068	FLCWORD11	(165-179)	(STATE +11)	
R0069	FLCWORD12	(180-194)	(STATE +12)	
R0070	FLCWORD13	(195-209)	(STATE +13)	
R0071	FLPC	138	BIT 12 FLAG 9	FLPCBIT
R0072	FLPI	129	BIT 11 FLAG 9	FLPIBIT
R0073	FLRCS	149	BIT 10 FLAG 9	FLRCSBIT
R0074	FLUNDISP	125	BIT 10 FLAG 8	FLUNDBIT
R0075	FLVR	136	BIT 14 FLAG 9	FLVRBIT
R0077	FREEFLAG	012	BIT 3 FLAG 0	FREEFBIT
R00775	FSPASFLG	005	BIT 17 FLAG 0	FSPASBIT
R0078	GLCKFAIL	046	BIT 14 FLAG 3	GLCKFBIT
R0079	GMPDRVSW	055	BIT 10 FLAG 6	GMPDRBIT
R0080	GUFSSW	028	BIT 2 FLAG 1	GUFSSBIT
R0081	HFLSHFLG	175	BIT 1 FLAG 11	HFLSHBIT
R0082	IDLEFLAG	113	BIT 7 FLAG 7	IDLEFBIT
R0083	IGNFLAG	107	BIT 13 FLAG 7	IGNFLBIT
R0084	IMPLLSW	036	BIT 9 FLAG 2	IMPLLBIT
R0085	IMLSE	007	BIT 8 FLAG 0	IMLSEBIT
R0086	INFINFLG	128	BIT 7 FLAG 8	INFINBIT
R0087	INITALGN	133	BIT 2 FLAG 8	INITABIT
R0088	INFLFLAG	151	BIT 14 FLAG 10	INFLFBIT
R0089	INTYPEFLG	056	BIT 4 FLAG 3	INTYPEBIT
R0090	ITSWICH	105	BIT 15 FLAG 7	ITSWBIT
R0091	JSWITCH	001	BIT 14 FLAG 0	JSWCHBIT
R0092	LETAORT	141	BIT 9 FLAG 9	LETAEBIT
R0093	LMCCNFLAG	124	BIT 11 FLAG 8	LMCCNBIT
R0094	LOKONSW	010	BIT 5 FLAG 1	LOKONBIT
R0095	LOSCMFLG	033	BIT 12 FLAG 2	LOSCMBIT
R00955	LPCS2FLG	174	BIT 6 FLAG 11	LPCS2BIT
R0096	LRALTEFLG	150	BIT 5 FLAG 12	LRALTEBIT
R0097	LRFPASS	165	BIT 15 FLAG 11	LRFPBIT

L FLAGWORD ASSIGNMENTS

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R0098	LRINH	172	BIT 8	FLAG 11	LRINHEIT
R0099	LRPDSFLG	189	BIT 6	FLAG 12	LRPDSBIT
R0100	LRVELFLG	187	BIT 8	FLAG 12	LRVELBIT
R0101	LLNAFLAG	048	BIT 12	FLAG 3	LLNARBIT
R0102	MANUFLAG	196	BIT 14	FLAG 7	MANUFBIT
R0103	MGLVFLAG	088	BIT 2	FLAG 5	MGLVFBIT
R0104	MICAVFLG	148	BIT 2	FLAG 9	MICAVEIT
R0105	MIDFLAG	002	BIT 13	FLAG 0	MIDFLBIT
R0106	MIDIFLAG	147	BIT 3	FLAG 9	MIDIBIT
R0107	MKCVFLAG	072	BIT 3	FLAG 4	MKCVBIT
R0108	MCCNFLAG	003	BIT 12	FLAG 0	MCCNBIT
R0109	MRKIDFLG	060	BIT 15	FLAG 4	MRKIDBIT
R0110	MRKNVFLG	066	BIT 9	FLAG 4	MRKNVBIT
R0111	MRLPTFLG	070	BIT 5	FLAG 4	MRLPTBIT
R0112	MUNFLAG	097	BIT 8	FLAG 6	MUNFLBIT
R0113	MWAITFLG	064	BIT 11	FLAG 4	MWAITBIT
R0114	NEEDLFLG	011	BIT 4	FLAG 0	NEEDLBIT
R01141	NEED2FLG	000	BIT 15	FLAG 0	NEED2BIT
R0115	NEWIFLG	122	BIT 13	FLAG 8	NEWIBIT
R0116	NJFTSFLG	015	BIT 15	FLAG	NJFTSBIT
R0117	NCCOFLAG	044	BIT 1	FLAG 2	NCCOBIT
R0118	NCLPREAD	170	BIT 10	FLAG 11	NCLRRBIT
R0119	NORMSW	110	BIT 10	FLAG 7	NCRMSBIT
R0120	NCRMCN	086	BIT 4	FLAG 5	NCRPMBIT
R0121	NCR29FLG	049	BIT 11	FLAG 3	NCR29BIT
R0122	NCTHRCTL	078	BIT 12	FLAG 5	NCTHRBIT
R0123	NCUPFLAG	024	BIT 6	FLAG 1	NCUPFBIT
R01235	NC511FLG	177	BIT 3	FLAG 11	NC511BIT
R0124	ARMNVFLC	067	BIT 8	FLAG 4	ARMNVBIT
R0125	ARMIDFLG	062	BIT 13	FLAG 4	ARMIDBIT
R0126	NRLPTFLG	071	BIT 4	FLAG 4	NRLPTBIT
R0127	NTARGFLG	102	BIT 3	FLAG 6	NTARGBIT
R0128	NWAITFLG	065	BIT 10	FLAG 4	NWAITBIT
R0129	CLDFSFLG	014	BIT 1	FLAG 0	CLDFSBIT
R0132	CRBWFLAG	054	BIT 6	FLAG 3	CRBWFBIT
R0133	CRDRSW	129	BIT 6	FLAG 8	CRDRBIT
R0134	CURRCFLG	198	BIT 12	FLAG 13	CURRCBIT
R0135	PCSPFLAG	063	BIT 12	FLAG 4	PCSPFBIT
R0136	PFRATEFLC	041	BIT 4	FLAG 2	PFRATEBIT
R0137	PINBRFLG	069	BIT 6	FLAG 4	PINBRBIT
R01375	PCHFLAG	045	BIT 15	FLAG 3	PCHFBIT
R0139	PRECIFLG	052	BIT 8	FLAG 3	PRECIBIT
R0140	PRICFLG	061	BIT 14	FLAG 1	PRICBIT
R0141	PRCNVFLG	068	BIT 7	FLAG 4	PRCNVEIT
R0142	PSTHICAT	169	BIT 11	FLAG 11	PSTHIBIT
R0143	PULSEFLG	195	BIT 15	FLAG 13	PULSES
R01432	P2IFLAG	004	BIT 11	FLAG 0	P2IFLBIT
R0144	P25FLAG	006	BIT 9	FLAG 0	P25FLBIT
R0145	P7071FLG	137	BIT 13	FLAG 9	P7071BIT
R0146	QUITFLAG	145	BIT 5	FLAG 5	QUITBIT

L FLAGWORD ASSIGNMENTS

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R0147	RACVDFLS		FLGWRD12	
R0148	RASFLAG		FLGWRD10	
R0149	RCCLFAIL	188	BIT 7 FLAG 12	RCCDFBIT
R0150	RCCDFLG	182	BIT 13 FLAG 12	RCCDFBIT
R0152	READPFLG	051	BIT 9 FLAG 3	RFADRBIT
R0154	READVFL	175	BIT 5 FLAG 11	READVBIT
R0155	REDFLAG	099	BIT 6 FLAG 6	REDFEBIT
R0156	REFSMFLG	047	BIT 13 FLAG 3	REFSMBIT
R0157	REINTEFLG	158	BIT 7 FLAG 10	REINTEBIT
R0158	RENDCEFLG	181	BIT 14 FLAG 12	RENDCEBIT
R0159	RENDWFLG	089	BIT 1 FLAG 5	RENDWBIT
R0160	REFOSMON	184	BIT 11 FLAG 12	REFOSEBIT
R0161	RHCSCFLG	203	BIT 7 FLAG 13	RHCSCALE
R0162	RNDVZFLG	008	BIT 7 FLAG 0	RNDVZBIT
R0163	RNGEDATA	176	BIT 4 FLAG 11	RNGEDBIT
R0164	RNGSCFLG	180	BIT 10 FLAG 5	RNGSCBIT
R01642	RDCFLAG	018	BIT 12 FLAG 1	RDCFLBIT
R01644	RDTFLAG	144	BIT 6 FLAG 9	RDTFLBIT
R0165	RPQFLAG	120	BIT 15 FLAG 8	RPQFLBIT
R0166	PRCATAFI	151	BIT 4 FLAG 12	PRCATARIT
R0167	RRRBSW	009	BIT 6 FLAG 0	RRRBRIT
R0168	RRRSFLAG	192	BIT 3 FLAG 12	RRRSBIT
R0169	RVSF	111	BIT 9 FLAG 7	RVSFBIT
R0170	R04FLAG	051	BIT 9 FLAG 3	RC4FLBIT
R0172	R10FLAG	013	BIT 2 FLAG 0	R10FLBIT
R0173	R61FLAG	020	BIT 10 FLAG 1	R61FLBIT
R0174	R77FLAG	079	BIT 11 FLAG 5	R77FLBIT
R0176	SLCPFSW	027	BIT 3 FLAG 1	SLCPFEBIT
R0177	SNUFFFR	077	BIT 13 FLAG 5	SNUFFRBIT
R0178	SCLNSW	087	BIT 3 FLAG 5	SCLNSBIT
R0179	SRCHOPTN	021	BIT 14 FLAG 2	SRCHCEBIT
R0180	STATEFLG	055	BIT 5 FLAG 3	STATEBIT
R0181	STEFRSW	024	BIT 11 FLAG 2	STEFRBIT
R0182	SURFFLAG	127	BIT 8 FLAG 8	SURFFRBIT
R0183	SWANDISF	109	BIT 11 FLAG 7	SWANDRBIT
R0184	S32.1F1	090	BIT 15 FLAG 6	S32BIT1
R0185	S32.1F2	092	BIT 14 FLAG 6	S32BIT2
R0186	S32.1F3A	092	BIT 13 FLAG 6	S32BIT3A
R0187	S32.1F3B	093	BIT 12 FLAG 6	S32BIT3B
R0188	TFFSW	119	BIT 1 FLAG 7	TFFSWBIT
R0189	TRACKFLG	025	BIT 5 FLAG 1	TRACKRBIT
R0190	TURNCFNL	194	BIT 1 FLAG 12	TURNCRBIT
R0191	ULLAGFLG	204	BIT 6 FLAG 13	ULLAGER
R0192	UPCATFLG	023	BIT 7 FLAG 1	UPCATRBIT
R0193	UPLCKFL	116	BIT 4 FLAG 7	UPLCKRBIT
R0194	USEQRFGL	196	BIT 14 FLAG 13	USEQRJTS
R0195	VFLUPFLG	022	BIT 8 FLAG 1	VFLUPRBIT
R0196	VFLDATA	173	BIT 7 FLAG 11	VFLDARBIT
R0197	VERIFLAG	117	BIT 3 FLAG 7	VERIFRBIT
R0198	VFLAG	090	BIT 10 FLAG 3	VFLAGRBIT

EQUIVALENT FLAG NAME: R04FLAG

EQUIVALENT FLAG NAME: READRFLG

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R0199	VFLSHFLG	178	BIT 2	FLAG 11	VFLSHBIT
R0200	VINTFLAC	057	PIT 3	FLAG 3	VINTFRIT
R0201	VXINH	168	BIT 12	FLAG 11	VXINHBIT
R0202	V37FLAC	114	PIT 6	FLAG 7	V37FLBIT
R0203	V67FLAC	112	BIT 8	FLAG 7	V67FLBIT
R0204	V82EMFLG	118	PIT 2	FLAG 7	V82EMBIT
R0205	XDELVFLG	037	BIT 8	FLAG 2	XDELVBIT
R0206	XDSPFLAC	074	BIT 1	FLAG 4	XDSPBIT
R0207	XCRFLG	171	BIT 9	FLAG 11	XCRFLBIT
R0208	XCVINFLG	201	BIT 9	FLAG 13	XCVINHIB
R0209	ZCCMFLAC	082	PIT 8	FLAG 5	ZCCMBIT
R0210	3AXISFLG	084	PIT 6	FLAG 5	3AXISEIT
R0211	360SW	134	PIT 1	FLAG 8	360SWBIT
A0212					

R0213 ASSIGNMENT AND DESCRIPTION OF FLAGWORDS

A0214	REF	1	0074	FLAGWRDC =	STATE +0	(000-014)	
A0215						(SET)	(RESET)
A0216					BIT 15 FLAG 0	(S)	
A0217			0000	NEED2FLG =	0000	DISPLAY CAP RATES	CHECK BIT 4 OF THIS
A0218	REF	1	4735	NEED2BIT =	BIT15	ON F041 NEEDLES.	WORD FOR DISPLAY
A0219							MODES (1 OR 2).
A0220			0001	JSWITCH =	0010	INTEGRATION OF W	INTEGRATION OF STATE
A0221							
A0222	REF	1	4736	JSWCHBIT =	BIT14	MATRIX	VECTOR
A0223							
A0224			0002	MIDFLAC =	0020	INTEGRATION WITH	INTEGRATION WITHOUT
A0225							
A0226						SECONDARY BODY AND	SOLAR PERTURBATIONS
A0227	REF	2	LAST 40	MIDFLBIT =	BIT12		
A0228			4737				
A0229			0003	MCCNFLAG =	0030	MCCN IS SPHERE OF	EARTH IS SPHERE OF
A0230							
A0231	REF	1	4740	MCCNEIT =	BIT12	INFLUENCE	INFLUENCE
A0232							
A0233					BIT 11 FLAG 0		
A0234			0004	P21FLAC =	0040	USE BASE VECTORS	1ST PASS -- CALC-
A0235	REF	2	LAST 43	P21FLBIT =	BIT11	ALREADY CALCULATED	ULATE BASE VECTORS
A0236			4741				
A0237					BIT 10 FLAG 0		

L FLAGWORD ASSIGNMENTS

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A0239	0239	0005	FSPASFLG =	0050	FIRST PASS THROUGH	NCT FIRST PASS THRU
A0240	0240	4742	FSPASBIT =	BIT10	REPOSITION ROUTINE	REPOSITION ROUTINE
A0241	0241			BIT 9 FLAG 0	(S)	
A0242	0242	0006	P25FLAG =	0060	P25 OPERATING	P25 NCT OPERATING
A0243	0243	4743	P25FLBIT =	BIT9		
A0244	0244					
A0245	0245			BIT 8 FLAG 0	(S)	
A0246	0246	0017	IMUSE =	0070	IMC IN USE	IMC NCT IN USE
A0247	0247	4744	IMUSEBIT =	BIT8		
A0248	0248					
A0249	0249			BIT 7 FLAG 0	(S)	
A0250	0250	0010	RNDVZFLG =	0080	P20 RUNNING (RADAR	P20 NCT RUNNING
A0251	0251	4745	RNDVZBIT =	BIT7	IN USE)	
A0252	0252					
A0253	0253			BIT 6 FLAG 0	(S)	
A0254	0254	0011	RNBSA =	0090	RADAR TARGET IN	RADAR TARGET IN
A0255	0255	4746	RNBSBIT =	BIT6	NR COORDINATES	SV COORDINATES
A0256	0256					
A0257	0257			BIT 5 FLAG 0	(S)	
A0258	0258	0012	LCKONSW =	0100	RADAR LOCK-ON	RADAR LOCK-ON NCT
A0259	0259	4747	LCKONBIT =	BIT5	DESIRED	DESIRED
A0260	0260					
A0261	0261			BIT 4 FLAG 0	(S)	
A0262	0262	0013	NRFLFLG =	0110	TOTAL ALTITUDE	A/F FOLLOWING
A0263	0263	4750	NRFLBIT =	BIT4	ERROR DISPLAYED	ERROR DISPLAYED
A0264	0264					
A0265	0265			BIT 3 FLAG 0	(S)	
A0266	0266	0014	FRFFFLAG =	0120	(USED BY P51-53 TEMP IN MANY DIFFERENT	
A0267	0267				ROUTINES & BY LUNAR + SOLAR EPHEMERIDES)	
A0268	0268	4751	FRFFFBIT =	BIT3		
A0269	0269					
A0270	0270			BIT 2 FLAG 0	(S)	
A0271	0271	0015	R10FLAG =	0130	P10 OUTPUTS DATA TO BESIDES OUTPUT WHEN	
A0272	0272	4752	R10FLBIT =	BIT2	ALTITUDE & ALTITUDE SET, R10 ALSO OUTPUT	
A0273	0273				RATE METERS ONLY	TO FORWARD & LATERAL
A0274	0274					VELOCITY CROSSPOINTR
A0275	0275					
A0276	0276			BIT 1 FLAG 0	(L)	
A0277	0277	0016	OLDFEFLG =	0140	P29 GYFC CMD LOOP	P29 GYFC CMD LOOP
A0278	0278	4753	OLDFEBIT =	BIT1	REQUESTED	NCT REQUESTED

L FLAGWORD ASSIGNMENTS

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A0279

0280 REF 2 LAST 65 0075 FLAGWRC1 = STATE +1 (015-029)

A0281

(SET)

(RESET)

A0282

0283 0017 NJFTSFLG = BIT 15 FLAG 1 (S)
0284 REF 2 LAST 65 4735 NJFTSBIT = 015D TWO JET RCS BURN FOUR JET RCS BURN
PIT15

A0285

A0286

BIT 14 FLAG 1 (L)

0287 0020 DICFLAG = 016D INERTIAL DATA IS PERFECM DATA DISPLAY
0288 REF 2 LAST 65 4736 DICFLBIT = BIT14 AVAILABLE INITIALIZATION FUNCS
A0289

A0290

BIT 13 FLAG 1 (S)

0291 0021 ERADEFLAG = 017D COMPUTE REARTH USE CONSTANT REARTH
0292 REF 3 LAST 65 4737 ERADEBIT = BIT13 FISCHER ELLIPSCID PAC RADIUS
A0293

A0294

BIT12 FLAG 1

0295 0022 RCCFLAG = 018D IF IN P66, NORMAL IF IN P66, RE-INIT-
0296 REF 2 LAST 65 4740 RCCFLBIT = BIT12 OPERATION CONTINUES. IALIZATION IS PER-
RESTART CLEARS FLAG FORMED AND FLAG IS
A0297
A02975

A0298

BIT 11 FLAG 1

A0299

=

019D

A02995

=

BIT11

A0300

BIT 10 FLAG 1 (L)

0301 0024 P61FLAG = 020D RUN R61 LEM RUN R65 LEM
0302 REF 2 LAST 66 4742 R61FLBIT = BIT10
A0303

A0304

BIT 9 FLAG 1

A0305

=

021D

A0306

=

BIT9

A0307

A0308

BIT 8 FLAG 1 (S)

0309 0026 VEFUPFLG = 022D CSM STATE VECTOR LEM STATE VECTOR
0310 REF 2 LAST 66 4744 VEFUPBIT = BIT8 BEING UPDATED BEING UPDATED
A0311

A0312

BIT 7 FLAG 1 (S)

0313 0027 UPDATEFLG = 023D UPDATING BY MARKS UPDATING BY MARKS
0314 REF 2 LAST 66 4745 UPDATBIT = BIT7 ALLOWED NOT ALLOWED
A0315

L FLAGWORD ASSIGNMENTS

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A0316					0330	NCUPFLAG =	BIT 6 FLAG 1	(S)	
0317							0240		
A0318									
0319	REF	2	LAST	66	4746	NCUPFEIT =	BIT6		
A0320									
A0321									
0322					0331	TRACKFLG =	BIT 5 FLAG 1	(S)	
0323	REF	2	LAST	66	4747	TRACKBIT =	0250		
A0324							BIT5		
A0325									
A0326							BIT 4 FLAG 1		
A0327							0260		
A0328							BIT4		
A0329									
0330					0333	SLOPESW =	BIT 3 FLAG 1	(S)	
A0331							0270		
0332	REF	2	LAST	66	4751	SLOPEBIT =	BIT3		
A0333									
A0334									
0335					0334	GLESSW =	BIT 2 FLAG 1	(S)	
0336	REF	2	LAST	66	4752	GLESSEIT =	0280		
A0337							BIT2		
A0338									
A0339							BIT 1 FLAG 1		
A0340							0290		
0341	REF	3	LAST	67	0376	FLAGWRD2 =	STATE +2	(C30--C44)	
A0342									
A0343									
0344					0336	DRIFTFLG =	BIT 15 FLAG 2	(S)	
0345	REF	3	LAST	67	4735	DRFTBIT =	0300		
A0346							BIT15		
A0347									
0348					0337	SRCHOPTN =	BIT 14 FLAG 2	(S)	
0349	REF	3	LAST	67	4736	SRCHCBIT =	0310		
A0350							BIT14		
A0351									
0352					0340	ACMOEFLG =	BIT 12 FLAG 2	(S)	
0353	REF	4	LAST	67	4737	ACMOEBIT =	0320		
A0354							BIT13		

L FLAGWCPD ASSIGNMENTS

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A0355								BIT 12 FLAG 2	(S)		
0356				0041		LOSCMFLC =	033D			LINE OF SIGHT BEING	LINE OF SIGHT NOT
A0357										COMPUTED (R21)	BEING COMPUTED
0358	REF	3	LAST	67	4740	LOSCMBIT =	BIT12				
A0359										IN R29 (L): RR GYRO	IN R29 (L): RR GYRO
A0360										CME LCCP RUNNING	CME LCCP OFF
A0361								BIT 11 FLAG 2	(S)		
0362				0042		STEERSW =	034D			SUFFICIENT THRUST	INSUFFICIENT THRUST
0363	REF	3	LAST	65	4741	STEERBIT =	BIT11			IS PRESENT	IS PRESENT
A0364											
A0365								BIT 10 FLAG 2	(S)		
A0368											
A0369								BIT 9 FLAG 2	(S)		
0370				0044		IMPULSW =	036D			MINIMUM IMPULSE	STEERING BURN (NO
A0371										BURN (CUTOFF TIME	CUTOFF TIME YET
0372	REF	2	LAST	66	4743	IMPULBIT =	BIT9			SPECIFIED)	AVAILABLE)
A0373											
A0374								BIT 8 FLAG 2	(S)		
0375				0045		XDELVFLC =	037D			EXTERNAL DELTAV VG	LAMBERT (AIMPCINT)
0376	REF	3	LAST	67	4744	XDELVBIT =	BIT8			COMPUTATION	VG COMPUTATION
A0377											
A0378								BIT 7 FLAG 2	(S)		
0379				0046		ETPIFLAG =	038D			ELEVATION ANGLE	TPI TIME SUPPLIED
A0380										SUPPLIED FOR	FOR P34,74 TO COMPLY
0381	REF	3	LAST	67	4745	ETPIBIT =	BIT7			P34,74	ELEVATION
A0382											
A0387								BIT 6 FLAG 2	(S)		
0388				0047		FINALFLC =	039D			LAST PASS THROUGH	INTERIM PASS THROUGH
A0389										RENDEZVOUS PROGRAM	RENDEZVOUS PROGRAM
0390	REF	3	LAST	68	4746	FINALBIT =	BIT6			COMPUTATIONS	COMPUTATIONS
A0391											
A0392								BIT 5 FLAG 2	(S)		
0393				0050		AVFLAG =	040D			LEM IS ACTIVE	CSM IS ACTIVE
0394	REF	3	LAST	68	4747	AVFLBIT =	BIT5			VEHICLE	VEHICLE
A0395											
A0396								BIT 4 FLAG 2	(S)		
0397				0051		PERATEFLC =	041D			PREFERRED ATTITUDE	PREFERRED ATTITUDE
0398	REF	2	LAST	66	4750	PERATBIT =	BIT4			COMPUTED	NOT COMPUTED
A0399											
A0400								BIT 3 FLAG 2	(S)		
0401				0052		CALCMAN3 =	042D			NO FINAL ROLL	FINAL ROLL IS

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A0402	REF	2	LAST	6E	4751	CALC2BIT =	BIT3	NECESSARY
A0403								
A0404							BIT 2 FLAG 2	(S)
0405					0153	CALCMAN2 =	043C	PERFORM MANEUVER
0406	REF	3	LAST	68	4752	CALC2BIT =	BIT2	STARTING PROCEDURE
A0407								BY PASS STARTING
								PROCEDURE
A0408							BIT 1 FLAG 2	(S)
0409					0054	NODOFLAG =	044D	V37 NOT PERMITTED
0410	REF	2	LAST	6E	4753	NODOBIT =	BIT1	V37 PERMITTED
A0411								
0412	REF	4	LAST	68	0077	FLAGWRE3 =	STATE +3	(045-059)
A0413								(SET)
								(RESET)
A0414							BIT 15 FLAG 3	
0415					0055	POCFFLAG =	045D	INHIBIT BACKWARDS
0416	REF	4	LAST	6E	4735	POCFBIT =	BIT15	ALLOW BACKWARDS
A04165								INTEGRATION
								INTEGRATION
A0417							BIT 14 FLAG 3	(S)
0418					0056	GLCKEFAIL =	046D	GIMBAL LOCK HAS
0419	REF	4	LAST	68	4736	GLCKE8BIT =	BIT14	NOT IN GIMBAL LOCK
A0420								COCCUPRED
A0421							BIT 13 FLAG 3	*** PROTECTED FROM FRESH START ***
0422					0057	REFSMELC =	047D	REFSMAT GOOD
0423	REF	5	LAST	6E	4737	REFSM8BIT =	BIT13	REFSMAT NO GOOD
A0424								
A0425							BIT 12 FLAG 3	(S)
0426					0060	LUNAFLAG =	048D	LUNAR LAT-LONG
0427	REF	4	LAST	69	4740	LUNA8BIT =	BIT12	EARTH LAT-LONG
A0428								
A0429							BIT 11 FLAG 3	(L)
0430					0061	NR29FLC =	049D	R29 NOT ALLOWED
0431	REF	4	LAST	69	4741	NR298BIT =	BIT11	R29 ALLOWED (RR DES-IGNATE, POWERED FLT)
A0432								
A0433							BIT 10 FLAG 3	(S)
0434					0062	VFLAG =	050D	LESS THAN TWO STARS
0435	REF	3	LAST	67	4742	VFLAG8BIT =	BIT10	TWO STARS IN FIELD
A0436								IN FIELD OF VIEW
								OF VIEW
A0437							BIT 9 FLAG 3	(S)
0438					0063	R04FLAG =	051D	ALARM 521
A0439								SUPPRESSED
								ALARM 521 ALLOWED

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A0440	REF	3	LAST	69	4743	RD4FLBIT =	BIT9		
A0441									
A0442							BIT 9 FLAG 2	(L)	
0443	REF	1			4743	READRFLG =	RD4FLAG	READING PR DATA	NCT READING PR DATA
0444	REF	4	LAST	71	4743	READPBIT =	BIT9	PUPSUAUT TC R29	PURSUAUT TO R29
A0445									
A0446							BIT 8 FLAG 2	(S)	
0447					4764	PRECIFLG =	052D	NCRMAL INTEGRATION	ENGAGES 4-TIME STEP
A0448								IN POC	(PCC) LOGIC IN INTE-
0449	REF	4	LAST	69	4744	PRECIBIT =	BIT8		GRATION
A0450									
A0451							BIT 7 FLAG 2	(S)	
0452					4765	CULTFLAG =	053D	STAR OCCULTED	STAR NCT OCCULTED
0453	REF	4	LAST	69	4745	CULPBIT =	BIT7		
A0454									
A0455							BIT 6 FLAG 2	(S)	
0456					4766	ORBWFLAG =	054D	W MATRIX VALID FOR	W MATRIX INVALID FOR
0457	REF	4	LAST	69	4746	ORBWBIT =	BIT6	CREITAL NAVIGATION	ORBITAL NAVIGATION
A0458									
A0459							BIT 5 FLAG 2	(S)	
0460					4767	STATEFLG =	055D	PERMANENT STATE	PERMANENT STATE
0461	REF	4	LAST	69	4747	STATEBIT =	BIT5	VECTOR UPDATED	VECTOR NCT UPDATED
A0462									
A0463							BIT 4 FLAG 2	(S)	
0464					4770	INTYPFLG =	056D	CONIC INTEGRATION	ENCKE INTEGRATION
0465	REF	3	LAST	69	4750	INTYPBIT =	BIT4		
A0466									
A0467							BIT 3 FLAG 2	(S)	
0468					4771	VINTEFLAG =	057D	CSM STATE VECTOR	LEM STATE VECTOR
0469	REF	4	LAST	70	4751	VINTFBIT =	BIT3	BEING INTEGRATED	BEING INTEGRATED
A0470									
A0471							BIT 2 FLAG 2	(S)	
0472					4772	D6OR9FLG =	058D	DIMENSION OF W IS 9	DIMENSION OF W IS 6
0473	REF	4	LAST	70	4752	D6CR9BIT =	BIT2	FOR INTEGRATION	FOR INTEGRATION
A0474									
A0475							BIT 1 FLAG 2	(S)	
0476					4773	DIMOFLEG =	059D	W MATRIX IS TC BE	W MATRIX IS NCT TO
0477	REF	3	LAST	70	4753	DIMOBIT =	BIT1	USED	BE USED
A0478									
0479	REF	5	LAST	70	4700	FLAGWRD4 =	STATE +4	(060-074)	

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A0480					(SET)	(PESET)			
A0481					BIT 15 FLAG 4	(S)			
0482				0074	MRKICFLG =	0600	MARK DISPLAY IN	NO MARK DISPLAY IN	
0483	REF	5	LAST	70	4735	MRKICBIT =	BIT15	ENCICLE	ENCICLE
A0484									
A0485						BIT 14 FLAG 4	(S)		
0486				0075	PRIODFLG =	0610	PRIORITY DISPLAY IN	NC PRIORITY DISPLAY	
0487	REF	5	LAST	70	4736	PRIODBIT =	BIT14	ENCICLE	IN ENCICLE
A0488									
A0489						BIT 13 FLAG 4	(S)		
0490				0076	NRMICFLG =	0620	NORMAL DISPLAY IN	NC NORMAL DISPLAY	
0491	REF	6	LAST	70	4737	NRMIDBIT =	BIT13	ENCICLE	IN ENCICLE
A0492									
A0493						BIT 12 FLAG 4	(S)		
0494				0077	PDSPEFLG =	0630	P20 SETS SC AS TO	LEAVE AS NORMAL DISP	
A0495									
0496	REF	5	LAST	70	4740	PDSPEBIT =	BIT12	TURN A NORMAL DIS-	PLAY INTO A PRIORITY
A0497									DISPLAY IN R6C
A0498									
A0499						BIT 11 FLAG 4	(S)		
0500				0100	MWAITFLG =	0640	HIGHER PRIORITY	NC HIGHER PRIORITY	
A0501									
0502	REF	5	LAST	70	4741	MWAITBIT =	BIT11	DISPLAY OPERATING	DISPLAY OPERATING
A0503								WHEN MARK DISPLAY	WHEN MARK DISPLAY
								INITIATED	INITIATED
A0504						BIT 10 FLAG 4	(S)		
0505				0101	NWAITFLG =	0650	HIGHER PRIORITY	NC HIGHER PRIORITY	
A0506									
0507	REF	4	LAST	70	4742	NWAITBIT =	BIT10	DISPLAY OPERATING	DISPLAY OPERATING
A0508								WHEN NORMAL	WHEN NORMAL DISPLAY
								DISPLAY INITIATED	INITIATED
A0509						BIT 9 FLAG 4	(S)		
0510				0102	MRKNVFLG =	0660	ASTRONAUT USING	ASTRONAUT NOT USING	
A0511								KEYBOARD WHEN MARK	KEYEARD WHEN MARK
0512	REF	5	LAST	71	4743	MRKNVBIT =	BIT9	DISPLAY INITIATED	DISPLAY INITIATED
A0513									
A0514						BIT 8 FLAG 4	(S)		
0515				0103	ARMNVFLG =	0670	ASTRONAUT USING	ASTRONAUT NOT USING	
A0516								KEYBOARD WHEN	KEYEARD WHEN
0517	REF	5	LAST	71	4744	ARMNVBIT =	BIT8	NORMAL DISPLAY	NORMAL DISPLAY
A0518								INITIATED	INITIATED
A0519						BIT 7 FLAG 4	(S)		
0520				0104	PRCNVFLG =	0680	ASTRONAUT USING	ASTRONAUT NOT USING	

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A0560 0561 A0562 0563 A0564	REF 7 LAST 72	4737	SNLFFER = SNLFFEIT =	BIT 12 FLAG 5 0770 BIT12	(S,L) U,V JETS DISABLED DURING EPS BURNS (V65)	U,V JETS ENABLED DURING EPS BURNS (V75)
A0565 0566 0567 A0568	REF 6 LAST 72	4740	NCTHRCTL = NCTHRBIT =	BIT 12 FLAG 5 0780 BIT12	(S) INHIBIT FULL THRCTLF	PERMIT FULL THRCTLLE
A0569 0570 A0571 A0572 0573 A0574	REF 6 LAST 72	4741	R77FLAG = R77FLBIT =	BIT 11 FLAG 5 0790 BIT11	(S,L) R77 IS CN, SUPPRESS ALL RADAR ALARMS AND TRACKER FAILS	R77 IS NOT CN.
A0575 0576 A0577 0578 A0579	REF 5 LAST 72	4742	RNGSCFLG = RNGSCBIT =	BIT 10 FLAG 5 0800 BIT10	(S) SCALE CHANGE HAS OCCURRED DURING RR READING	NO SCALE CHANGE HAS OCCURRED DURING RR READING
A0580 0581 0582 A0583 A0584 0585 0586 A0587	REF 6 LAST 72	4743	DMENFLG = DMENFEIT =	BIT 9 FLAG 5 0810 BIT9	(S) DIMENSION OF W IS 9 FOR INCORPORATION	DIMENSION OF W IS 6 FOR INCORPORATION
A0588 0589 0590 A0591	REF 6 LAST 73	4745	ZOOMFLAG = ZOOMBIT =	BIT 8 FLAG 5 0820 BIT8	(S) THROTTLE-UP HAS OCCURRED IN P63.	THROTTLE-UP HAS NOT YET OCCURRED IN P63.
A0588 0589 0590 A0591	REF 6 LAST 73	4745	ENGONFLG = ENGONBIT =	BIT 7 FLAG 5 0830 BIT7	(S) ENGINE TURNED ON	ENGINE TURNED OFF
A0592 0593 A0594 0595 A0596	REF 6 LAST 73	4746	3AXISFLG = 3AXISEIT =	BIT 6 FLAG 5 0840 BIT6	(S) MANEUVER SPECIFIED BY THREE AXES	MANEUVER SPECIFIED BY ONE AXIS; R6C CALLS VECPCINT.
A0597 0598 0599 A05995	REF 6 LAST 73	4747	ACRBSFLG = ACRBSYST =	BIT 5 FLAG 5 0850 BIT5	PREFER PAXIS JET PAIRS 7,15 AND 8,16	PREFER PAXIS JET PAIRS 4,12 AND 3,11

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FC S4

A0600						BIT 4 FLAG 5	(S)	
0601				0126	NORRMEN =	086D	BYPASS RR GIMBAL	PERFORM
0602	REF	5	LAST	73	4750	NORRMBIT =	BIT4	RR GIMBAL MONITOR
A0603								
A0604						BIT 3 FLAG 5	(S)	
0605				0127	SCLNSW =	087D	LAMBERT COFS NOT	LAMBERT CONVERGES CR
A0606							CONVERGE, CR TIME-RADTIME-RADIUS ACN	
0607	REF	6	LAST	73	4751	SCLNSBIT =	BIT3	NEARLY CIRCULAR CIRCULAR
A0608								
A0609						BIT 2 FLAG 5	(S)	
0610				0130	MGLVFLAG =	088D	LOCAL VERTICAL	MIDDLE GIMBAL ANGLE
A0611							COORDINATES	COMPUTED
0612	REF	5	LAST	71	4752	MGLVFEIT =	BIT2	
A0613								
A0614						BIT 1 FLAG 5	(S)	
0615				0131	RENDFLE =	089D	W MATRIX VALID	W MATRIX INVALID
A0616							FOR RENDEZVUS	FOR RENDEZVUS
0617	REF	5	LAST	73	4753	RENDFEIT =	BIT1	NAVIGATION
A0618								
0619	REF	7	LAST	73	4102	FLAGWORD =	STATE +6	(090-104)
A0620							(SET)	(RESET)
A0621						BIT 15 FLAG 6	(S)	
0622				0132	S32.1F1 =	090D	DELTA V AT CSI TIME	DVT1 LESS THEN MAX
0623	REF	7	LAST	73	4735	S32BIT1 =	BIT15	ONE EXCEEDS MAX
A0624								
A0625						BIT 14 FLAG 6	(S)	
0626				0133	S32.1F2 =	091D	FIRST PASS OF	REITERATION OF
0627	REF	6	LAST	72	4736	S32BIT2 =	BIT14	NEWTON ITERATION
A0628								
A0629						BIT 13 FLAG 6	(S)	
0630				0134	S32.1F3A =	092D	BIT 13 AND BIT 12 FUNCTION AS AN ORDERED	
0631	REF	8	LAST	74	4737	S32BIT3A =	BIT13	PAIR (13,12) INDICATING THE POSSIBLE CO-
A0632							CURRANCE OF 2 NEWTON ITERATIONS FOR S32.1	
A0633							IN THE PROGRAM IN THE FOLLOWING ORDER:	
A0634						BIT 12 FLAG 6	(S)	
0635				0135	S32.1F3B =	093D	(0,1) (I.E. BIT 13 RESET, BIT 12 SET)	
0636	REF	7	LAST	74	4740	S32BIT3B =	BIT12	= FIRST NEWTON ITERATION BEING DONE
A0637							(0,0) = FIRST PASS OF SECOND NEWT. ITERAT.	
A0638							(1,1) = 50 FT/SEC STAGE OF SEC. NEWT. ITER	
A0639							(1,C) = REMAINDER OF SECOND NEWTON ITERAT.	
A0640						BIT 11 FLAG 6	(S)	

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A0643								
A0644						BIT 10 FLAG 6	(S)	
0645				1137	GMBDRVSW =	095D	TRIMMING OVER	TRIMMING NOT OVER
0646	REF	6	LAST	74	4742	GMBDRBIT =	BIT10	
A0647								
A0648						BIT 9 FLAG 6		
A0649					=	096D		
A0650					=	BIT9		
A0651								
A0654						BIT 8 FLAG 6	(S)	
0655				1141	MUNFLAG =	097D	SERVICER CALLS	SERVICER CALLS
0656	REF	7	LAST	74	4744	MUNFLBIT =	MUNRVG	CALCRVG
A0657								
A0658						BIT 7 FLAG 6	(L)	
0659				0142	=	098D		
0660	REF	7	LAST	74	4745	=	BIT7	
A0661								
A0662						BIT 6 FLAG 6	(L)	
0663				0143	REDFLAG =	099D	LANDING SITE	LANDING SITE
A0664							REDESIGNATION	REDESIGNATION NOT
0665	REF	7	LAST	74	4746	REDFLBIT =	BIT6	PERMITTED
A0666								PERMITTED
A0667						BIT 5 FLAG 6		
A0668					=	100D		
A0669								
A0670						BIT 4 FLAG 6		
A0671					=	101D		
A0672						BIT 3 FLAG 6	(S)	
0673				0146	NTARGFLG =	102D	ASTRONAUT CID	ASTRONAUT CID NOT
A0674							OVERWRITE DELTA	OVERWRITE DELTA
0675	REF	7	LAST	75	4751	NTARGBIT =	BIT3	PASS EVEN IF THE
A0676							VELOCITY AT TFI	VELOCITY
							CP TPM (P34,35)	
A0677						BIT 2 FLAG 6		
0678				0147	ALXFLAG =	103D	PROVICING ICLEFLAG	SERVICER WILL SKIP
0679	REF	6	LAST	75	4752	AUXFLBIT =	BIT2	DVMCN ON ITS NEXT
A0680							IS NOT SET, SERV-	PASS EVEN IF THE
A0681							ICER WILL EXERCISE	ICLEFLAG IS NOT SET.
A0682							DVMCN ON ITS NEXT	IT WILL THEN SET
A0683							PASS.	AUXFLAG.
A0684						BIT 1 FLAG 6	(L)	

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A0685					0150	ATTFLAG =	1040	LEM ATTITUDE EXISTS	NO LEM ATTITUDE
A0686								IN MCCN-FIXED	AVAILABLE IN MCCN-
0687	REF	6	LAST	75	4752	ATTFLEBIT =	BIT1	COORDINATES	FIXED COORDINATES
A0688									
0689	REF	8	LAST	75	0103	FLAGWORD =	STATE +7	(105-119)	
A0690								(SET)	(RESET)
A0691							BIT 15 FLAG 7	(S)	
0692					0151	ITSWICH =	1050	P34;TPI TIME TO BE	TPI HAS BEEN
0693	REF	8	LAST	75	4725	ITSWBIT =	BIT15	COMPUTED	COMPUTED
A0694									
A0695							BIT 14 FLAG 7	(S)	
0696					0152	MANUFLAG =	1060	ATTITUDE MANEUVER	NO ATTITUDE MANEUVER
A0697								GOING DURING RR	DURING RR SEARCH
0698	REF	7	LAST	75	4736	MANUEBIT =	BIT14	SEARCH	
A0699									
A0700							BIT 13 FLAG 7	(S)	
0701					0153	IGNFLAG =	1070	TIC HAS ARRIVED	TIC HAS NOT ARRIVED
0702	REF	9	LAST	75	4737	IGNFLBIT =	BIT13		
A0703									
A0704							BIT 12 FLAG 7	(S)	
0705					0154	ASTNFLAG =	1080	ASTRONAUT HAS	ASTRONAUT HAS NOT
0706	REF	8	LAST	75	4740	ASTNBIT =	BIT12	OKAYED IGNITION	OKAYED IGNITION
A0707									
A0708							BIT 11 FLAG 7	(L)	
0709					0155	SWANDISP =	1090	LANDING ANALOG	LANDING ANALOG
0710	REF	7	LAST	74	4741	SWANDBIT =	BIT11	DISPLAYS ENABLED	DISPLAYS SUPPRESSED
A0711									
A0712							BIT 10 FLAG 7	(S)	
0713					0156	NCRMSW =	1100	UNIT NORMAL INPUT	LAMBERT COMPUTES ITS
0714	REF	7	LAST	76	4742	NCRMSBIT =	BIT10	TO LAMBERT	OWN UNIT NORMAL
A0715									
A0716							BIT 9 FLAG 7	(S)	
0717					0157	RVSW =	1110	DO NOT COMPUTE	COMPUTE FINAL STATE
A0718								FINAL STATE VECTOR	VECTOR IN TIME-THETA
0719	REF	7	LAST	74	4743	RVSWEIT =	BIT9	IN TIME-THETA	
A0720									
A0721							BIT 8 FLAG 7	(S)	
0722					0160	V67FLAG =	1120	ASTRONAUT OVERWRITE	ASTRONAUT DOES NOT
A0723								W-MATRIX INITIAL	OVERWRITE W-MATRIX
0724	REF	8	LAST	76	4744	V67FLBIT =	BIT8	VALUES	INITIAL VALUES

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A0725

AC726

BIT 7 FLAG 7 (S)

0727

161

IDLEFLAG =

113D

NO CV MONITOR

CONNECT DV MONITOR

0728

REF

8

LAST

76

4745

IDLEFBIT =

BIT7

A0729

A0730

BIT 6 FLAG 7 (S)

0731

1162

V37FLAG =

114D

AVERAGEG (SERVICER) AVERAGEG (SERVICER)

0732

REF

8

LAST

76

4746

V37FLBIT =

BIT6

RUNNING

OFF

A0733

AC734

BIT 5 FLAG 7 (S)

0735

1163

AVEGFLAG =

115D

AVERAGEG (SERVICER) AVERAGEG (SERVICER)

0736

REF

7

LAST

74

4747

AVEGFBIT =

BIT5

DESIRED

NOT DESIRED

A0737

A0738

BIT 4 FLAG 7 (S)

0739

1164

UPLOCKFL =

116D

K-KBAR-K FAIL

NO K-KBAR-K FAIL

0740

REF

6

LAST

75

4750

UPLCCBIT =

BIT4

A0741

A0742

BIT 3 FLAG 7 (S)

0743

1165

VERIFLAG =

117D

CHANGED WHEN V33E OCCURS AT END OF P27

0744

REF

8

LAST

76

4751

VERIFBIT =

BIT3

A0745

A0746

BIT 2 FLAG 7 (L,C)

0747

1166

V82EMFLC =

118D

MOON VICINITY

EARTH VICINITY

0748

REF

7

LAST

76

4752

V82EMBIT =

BIT2

A0749

AC750

BIT 1 FLAG 7 (S)

0751

1167

TFFSW =

119D

CALCULATE TPEPIGEE CALCULATE TFF

0752

REF

7

LAST

77

4753

TFFSWBIT =

BIT1

A0753

0754

REF

9

LAST

77

1184

FLAGWRDE =

STATE +3C

(120-134)

A0755

(SET)

(RESET)

A0756

BIT 15 FLAG 8 (S)

0757

1170

RPQFLAG =

120D

RPG NOT COMPUTED RPG COMPUTED

A0758

0759

REF

9

LAST

77

4735

RPQFLBIT =

BIT15

RPQ = VECTOR BETWEEN SECONDARY BODY AND PRIMARY BODY

A0760

A0761

A0762

BIT 14 FLAG 8

A0763

=

121D

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A0764					=	BIT14	
A0765							
A0766						BIT 13 FLAG 8	(S)
0767				0172	NEWIFLG =	122D	FIRST PASS THROUGH SUCCEEDING ITERATION
0768	REF	10	LAST	77	NEWIBIT =	BIT13	INTEGRATION OF INTEGRATION
A0769				4737			
A0770						BIT 12 FLAG 8	*** PROTECTED FROM FRESH START ***
0771				0173	CMCONFLG =	123D	PERMANENT CSM STATE PERMANENT CSM STATE
0772	REF	9	LAST	77	CMCONBIT =	BIT12	IN LUNAR SPHERE IN EARTH SPHERE
A0773				4740			
A0774						BIT 11 FLAG 8	*** PROTECTED FROM FRESH START ***
0775				0174	LMOONFLG =	124D	PERMANENT LM STATE PERMANENT LM STATE
0776	REF	8	LAST	77	LMCONBIT =	BIT11	IN LUNAR SPHERE IN EARTH SPHERE
A0777				4741			
A0778						BIT 10 FLAG 8	(L)
0779				0175	FLUNDISF =	125D	CURRENT GUIDANCE CURRENT GUIDANCE
0780	REF	8	LAST	77	FLUNDBIT =	BIT10	CISPLAYS INHIBITED CISPLAYS PERMITTED
A0781				4742			
A0782						BIT 9 FLAG 8	(L)
A0783					=	126D	
A0784					=	BIT9	
A0785							
A0786						BIT 8 FLAG 8	*** PROTECTED FROM FRESH START ***
0787				0177	SUPFFLAG =	127D	LM ON LUNAR SURFACE LM NOT ON LUNAR
0788	REF	9	LAST	77	SUPFFBIT =	BIT8	SURFACE
A0789				4744			
A0790						BIT 7 FLAG 8	(S)
0791				0200	INFINFLG =	128D	NO CONIC SOLUTION CONIC SOLUTION
A0792							(CLOSURE THROUGH EXISTS
0793	REF	9	LAST	78	INFINBIT =	BIT7	INFINITY REQUIRED)
A0794				4745			
A0795						BIT 6 FLAG 8	(S)
0796				0201	CRDERSW =	129D	ITERATOR USES 2ND ITERATOR USES 1ST
0797	REF	9	LAST	78	CRCFREIT =	BIT6	ORDER MINIMUM MCDE ORDER STANDARD MCDE
A0798				4746			
A0799						BIT 5 FLAG 8	(S)
0800				0202	APSESW =	130D	PERICENTER-APOCENTER PERICENTER-APOCENTER
0801							RANGE IN TIME-RADIUS RANGE IN TIME-RADIUS
0802	REF	8	LAST	78	APSESBIT =	BIT5	
A0803				4747			

L FLAGWORD ASSIGNMENTS

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EO 54

A0804 0805 A0806 0807 A0808	REF 7 LAST 78	0203 4750	CCCAFLAG = CCCAFEIT =	BIT 4 FLAG 8 131D BIT4	(S) NO CONIC SOLUTION - CONIC SOLUTION TOO CLOSE TO RECTI- EXISTS (COGA CGES NOT LINEAR (CCGA CVRFLWS) CVERFLCW)
A0809 A0810			=	BIT 3 FLAG 8 132D	
A0811 0812 0813 A0814	REF 8 LAST 78	0205 4752	INITALGN = INITABIT =	BIT 2 FLAG 8 133D BIT2	(L) INITIAL PASS THRU SECOND PASS THRU P57 P57 (CHECK RESET-MILLARE)
A0815 0816 0817 A0818	REF 8 LAST 78	0206 4753	360SW = 360SWBIT =	BIT 1 FLAG 8 134D BIT1	(S) TRANSFER ANGLE NEAR TRANSFER ANGLE NOT 360 DEGREES NEAR 360 DEGREES
0819 A0820 A0821	REF 10 LAST 78	0105	FLAGWRD9 =	STATE +9D	(135 - 149) (SET) (RESET)
A0822 A0823 A08231			= =	BIT 15 FLAG 9 135D BIT15	
A0824 0825 0826 A0827	REF 8 LAST 77	0210 4736	FLVR = FLVRBIT =	BIT 14 FLAG 9 136D BIT14	(L) VERTICAL RISE NON-VERTICAL RISE (ASCENT GUIDANCE)
A0828 0829 08295 A0820	REF 11 LAST 79	0211 4737	P7071FLG = P7071BIT =	BIT 13 FLAG 9 137D BIT13	P70 OR P71 IS USING P12 IS USING THE ASCENT GUID. EGS. ASCENT GUID. EGS.
A0831 0832 0833 A0834	REF 10 LAST 79	0212 4740	FLPC = FLPCBIT =	BIT 12 FLAG 9 138D BIT12	(L) NO POSITION CONTROL POSITION CONTROL (ASCENT GUIDANCE)
A0835 0836 0837 A0838	REF 9 LAST 79	0213 4741	FLPT = FLPTBIT =	BIT 11 FLAG 9 139D BIT11	(L) PRE-IGNITION PHASE REGULAR GUIDANCE (ASCENT GUIDANCE)
A0839 0840		0214	FLPCS =	BIT 10 FLAG 9 140D	(L) RCS INJECTION MODE MAIN ENGINE MODE

L FLAGWORD ASSIGNMENTS

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0882 REF 1 0106 RASFLAG EQUALS FLAGWORD WAS ONLY AN INSTALL- FRASSTALL FLAG
A0883

0884 REF 11 LAST 80 0106 FLAGWORD = STATE +100 (150 - 164)

A0885 (SET) (RESET)

A0886 BIT 15 FLAG 10
A0887 = 1500
A0888

A0889 BIT 14 FLAG 10 (L,C)
0890 0227 INTEFLAG = 1510 INTEGRATION IN INTEGRATION NOT IN
0891 REF 9 LAST 80 4736 INTEFLBIT = BIT14 PROGRESS PROGRESS
A0892

A0893 BIT 13 FLAG 10 (S,L)
0894 0230 APSFLAG = 1520 ASCENT STAGE DESCENT STAGE
0895 REF 12 LAST 80 4737 APSFLBIT = BIT13 ***PROTECTED FROM FRESH START ***
A0896

A0897 BIT 12 FLAG 10
A0898 = 1530
A0899

A0900 BIT 11 FLAG 10
A0901 = 1540
A0902

A0903 BIT 10 FLAG 10
A0904 = 1550
A0905

A0906 BIT 9 FLAG 10
A0907 = 1560
A0908

A0909 BIT 8 FLAG 10
A0910 = 1570
A0911

A0912 BIT 7 FLAG 10 (L,C)
0913 0236 REINTEFLAG = 1580 INTEGRATION ROUTINE INTEGRATION ROUTINE
0914 REF 10 LAST 70 4745 REINTEBIT = BIT7 TO BE RESTARTED NOT TO BE RESTARTED
A0915

A0916 BIT 6 FLAG 10
A0917 = 1590
A0918

L FLAGWORD ASSIGNMENTS

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A0919
A0920
A0921

=

BIT 5 FLAG 10
160D

A0922
A0923
A0924

=

BIT 4 FLAG 10
161D

A0925
A0926
A0927

=

BIT 3 FLAG 10
162D

A0928
A0929
A0930

=

BIT 2 FLAG 10
163D

A0931
A0932
A0933

=

BIT 1 FLAG 10
164D

A0934

A0935 REF 12 LAST 82 0107 FLGWRD11 = STATE +11C (165 - 179)

A0936 (SET) (RESET)

A0937
0938
0939 REF 10 LAST 78 0245 4735 LRBPASS = BIT 15 FLAG 11 (L)(R12)
0939 REF 10 LAST 78 4735 LREYEIT = BIT 15 BYPASS ALL LANDING DC NOT BYPASS LR
RACAR UPDATES UPDATES

A0941
A0942
A0943
A0944

=

BIT 14 FLAG 11
166D
BIT 14

A0945
A0946
A0947
A0948

=

BIT 13 FLAG 11
167D
BIT 13

A0949
0950
A0951
0952 REF 11 LAST 80 4740 VXINF = BIT 12 FLAG 11 (L)(R12)
A0952 0952 REF 11 LAST 80 4740 VXINF-BIT = BIT 12 IF Z VELOCITY DATA UPDATE X AXIS
UNREASONABLE, VELOCITY
BYPASS X VELOCITY
UPDATE ON NEXT PASS

A0954
0955 0251 PSTHICAT = BIT 11 FLAG 11 (L)(R12)
169D PAST HIGATE PREHIGATE

L FLAGWORD ASSIGNMENTS

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0956 A0957	REF 10 LAST 80	4741	PSTHIBIT =	BIT11		
A0958 0959 A0960		4252	NCLRREAD =	BIT 10 FLAG 11 1710	(L)(R12) LANDING RADAR REPOSITIONING;	LR ACT REPOSITIONING
0961 A0962	REF 10 LAST 81	4742	NCLRREBIT =	BIT10	BYPASS UPDATE	
A0963 0964 A0965		4253	XCRFLG =	BIT 9 FLAG 11 1710	(L)(R12) BELOW LIMIT INHIBIT X AXIS	ABOVE LIMIT DO NOT INHIBIT
0966 A0967	REF 9 LAST 81	4743	XCRFLEIT =	BIT9	OVERRIDE	
A0968 0969 0970 A0971 A0972	REF 11 LAST 81	4744	LRINH = LRINHBIT =	BIT 8 FLAG 11 1720 BIT8	LANDING RADAR UP- DATES PERMITTED BY ASTRONAUT	LR UPDATES INHIBITED BY ASTRONAUT
A0973 0974 0975 A0976	REF 11 LAST 82	4745	VELDATA = VELDABIT =	BIT 7 FLAG 11 1730 BIT7	(L)(R12) LR VELOCITY MEASUREMENT MADE	LR VELOCITY MEASURE NOT MADE
A0977 0978 0979 A0980	REF 11 LAST 81	4746	LPDS2FLG = LPDS2BIT =	BIT 6 FLAG 11 1740 BIT6	(L)(R12) USE LR POSITION 2 TRANSFORMATION	USE LR POSITION 1 TRANSFORMATION
A0981 0982 0983 A0984	REF 10 LAST 91	4747	READVEL = READVBIT =	BIT 5 FLAG 11 1750 BIT5	(L)(R12) CK TO READ LR VELOCITY DATA	DO NOT READ LR VELOCITY DATA
A0985 0986 0987 A0988	REF 8 LAST 80	4750	RNCEDATA = RNGFCBIT =	BIT 4 FLAG 11 1760 BIT4	(L)(R12) LR ALTITUDE MEASUREMENT MADE	LR ALTITUDE MEASURE NOT MADE
A0989 0990 0991 A0992	REF 10 LAST 81	4751	NC511FLG = NC511BIT =	BIT 3 FLAG 11 1770 BIT3	DO NOT TEST LR ANTENNA FCS IN R12	TEST LR ANTENNA FCS IN R12
A0994 0995 0996 A0997	REF 10 LAST 81	4752	VFLSHFLG = VFLSHBIT =	BIT 2 FLAG 11 1780 BIT2	(L)(R12) LR VELOCITY FAIL LAMP SHOULD BE FLASHING	LR VEL FAIL LAMP SHOULDN'T FLASH

L FLAGWORD ASSIGNMENTS

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A0998

A0999

BIT 1 FLAG 11

(L)(R12)

1000

0263

FFLSHFLG =

179D

LR ALTITUDE FAIL

LR ALTITUDE FAIL

1001

REF 10

LAST

81

4752

FFLSHBIT =

BIT1

LAMP SHOULD BE

LAMP SHOULD NOT BE

A1002

FLASHING

FLASHING

A1003

1004

REF 1

0110

RADMODES EQUALS FLAGWORD12

RADAR FLAG WORD

A1005

1006

REF 12

LAST

82

0110

FLAGWORD12 =

STATE +12C

(180 - 194)

WAS RADMODES

A1007

(SET)

(RESET)

A1008

BIT 15 FLAG 12

1009

0264

CONTFLAG =

180C

CONTINUOUS DESIG-

LCC CHECKS FOR LOCK-

1010

REF 11

LAST

83

4735

CONTBIT =

BIT15

NATE. LCC COMMANDS

ON WHEN ANTENNA

A1011

RR RECAPLESS OF

BEING DESIGNATED

A1012

LOCK-CN

A1013

A1014

BIT 14 FLAG 12

1015

0265

REMODEFLG =

181D

CHANGE IN ANTENNA

NO REMODE REQUESTED

1016

REF 10

LAST

82

4736

REMODEBIT =

BIT14

MODE BEEN REQUESTED OR OCCURRING

A1017

I.E., REMODE

A1018

A1019

BIT 13 FLAG 12

1020

0266

RCDOFLG =

182D

RR CDL'S BEING

RR CDL'S NOT BEING

1021

REF 13

LAST

82

4737

RCDOBIT =

BIT13

ZEROCED

ZEROCED

A1022

A1023

BIT 12 FLAG 12

1024

0267

ANTENFLG =

183D

RR ANTENNA MODE IS

RR ANTENNA IN MODE 1

1025

REF 12

LAST

82

4740

ANTENBIT =

BIT12

MODE 2

A1026

A1027

BIT 11 FLAG 12

1028

0270

REPCSMCN =

184D

REPOSITION MONITOR. NO REPOSITION TAKING

1029

REF 11

LAST

84

4741

REPOSBIT =

BIT11

RR REPOSITION IS PLACE

A1030

TAKING PLACE

A1031

A1032

BIT 10 FLAG 12

1033

0271

DESIGFLG =

185C

RR DESIGNATE

RR DESIGNATE NOT

1034

REF 11

LAST

84

4742

DESIGBIT =

BIT10

REQUESTED OR IN

REQUESTED OR IN

A1035

PROGRESS

PROGRESS

A1036

L FLAGWORD ASSIGNMENTS

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A1078 A1079	REF 1			0111	DAPBCCLS EQUALS FLGWRD13	DIGITAL AUTOFILCT FLAGWCRE	
A1080 A1081	REF 14 LAST 85			0111	FLGWRD13 =	STATE +130	(195 - 209) WAS DAPBCCLS (SET) (RESET)
A1082 A1083 A1084 A1085 A1086	REF 12 LAST 85			0303 4735	PULSEFLG = PLLSSES =	BIT 15 FLAG 13 1950 BIT15	MINIMUM IMPULSE COMMAND MODE IN "ATT HOLD" (V76) NOT IN MINIMUM IMPULSE COMMAND MODE (V77)
A1087 A1088 A1089 A1090	REF 11 LAST 85			0304 4736	USEQRFLG = USEQRJTS =	BIT 14 FLAG 13 1960 BIT14	GIMBAL UNLSABLE. LSE JETS ONLY. TRIM GIMBAL MAY BE USED.
A1091 A1092 A1093 A1094	REF 14 LAST 85			1305 4737	CSMOKFLG = CSMDOCKC =	BIT 13 FLAG 13 1970 BIT13	CSM DOCKED. USE BACKUP DAP CSM NOT DOCKED TO LM
A1095 A1096 A1097 A1098	REF 13 LAST 85			0306 4740	CLRRCLG = CLRRCBIT =	BIT 12 FLAG 13 1980 BIT12	CURRENT DAP PASS IS RATE COMMAND CURRENT DAP PASS IS NCT RATE COMMAND
A1099 A1100 A1101 A1102	REF 12 LAST 85			0307 4741	ACC4-2FL = ACC4CR2X =	BIT 11 FLAG 13 1990 BIT11	4 JET X-AXIS TRANS- LATION REQUESTED 2 JET X-AXIS TRANS- LATION REQUESTED
A1103 A1104 A1105 A1106	REF 12 LAST 85			0310 4742	ACRBTLG = ACRBTRAN =	BIT 10 FLAG 13 2000 BIT10	B SYSTEM FOR X- TRANSLATION A SYSTEM FOR X- TRANSLATION PREFERRED
A1107 A1108 A1109 A1110	REF 11 LAST 86			0311 4743	XOVINFLG = XOVINFIB =	BIT 9 FLAG 13 2010 BIT9	X-AXIS OVERRIDE LOCKED OUT X-AXIS OVERRIDE OKAY
A1111 A1112 A1113 A1114	REF 13 LAST 86			0312 4744	DRIFTDFL = DRIFTBIT =	BIT 8 FLAG 13 2020 BIT8	ASSUME C OFFSET DRIFTING FLIGHT. USE OFFSET ACCELE- RATION ESTIMATE
A1115 A1116				0313	RHCSGFLC =	BIT 7 FLAG 13 2030	NORMAL FFC SCALING FINE FFC SCALING

L FLAGWORD ASSIGNMENTS

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A1117 A1118	REF 12 LAST 86	4745	RHCSCALE =	BIT7	REQUESTED	REQUESTED
A1119 1120 1121 A1122	REF 13 LAST 86	4314 4746	ULLAGFLG = ULLAGER =	BIT 6 FLAG 13 204D BIT6	ULLAGE REQUEST BY MISSICA PROGRAM	NO INTERNAL ULLAGE REQUEST
A1123 1124 1125 A11251 A1126	REF 12 LAST 86	4315 4747	DESL2FLG = DESELECT2 =	BIT 5 FLAG 13 205D BIT5	5 DEG DEADBAND SELECTED BY CREW	1 OR .3 DEG DEADBAND SELECTED BY CREW (SEE BIT4 CAPECOLS)
A1127 1128 1129 A1130	REF 10 LAST 86	4316 4750	DRSELFLG = DRSELECT =	BIT 4 FLAG 13 206D BIT4	1 DEG DEADBAND SELECTED BY CREW	MIN DR SELECTED BY CREW (0.3 DEG)
A1131 1132 1133 A1134 A1135	REF 12 LAST 86	4317 4751	ACCKFLG = ACCSCKAY =	BIT 3 FLAG 13 207D BIT3	CONTROL AUTHORITY VALUES FROM 1/ACCS USABLE	RESTART OR FRESH S1. SINCE LAST 1/ACCS; CLIPPLIS SUSPECT.
A1136 1137 1138 A1139 A1140 A1141	REF 12 LAST 86	4320 4752	ALTR2FLG = ALTRATE2 =	BIT 2 FLAG 13 208D BIT2	THESE FLAGS ARE USED TOGETHER TO INDICATE ASTRONAUT-CH-SEN KALCMANU MANEUVER RATES (0,0)=(BIT2,BIT1)= 0.2 DEG/SEC (0,1)= 0.5 DEG/SEC	
1142 1143 A1144	REF 12 LAST 86	4321 4753	AUTR1FLG = ALTRATE1 =	BIT 1 FLAG 13 209D BIT1	(1,0)= 2.0 DEG/SEC (1,1)= 10.0 DEG/SEC	

L SUBROUTINE CALLS

USER'S PAGE NO. 1 EC 94

0001	0000	SUBRC	LLMERASE	128
0002	0000	SUBRC	LEMONAID	099
0003	0000	SUBRC	LEMP20S	140
0004	0000	SUBRC	LEMP30S	105
0005	0000	SUBRC	KISSING	092
0006 *	0000	SUBRC	FLY	146
0007	0000	SUBRC	LEMP50S	118
0008	0000	SUBRC	SKIPPER	097
0009	0000	SUBRC	LMDAP	023

*** END OF MAIN PROGRAM ***

L ERASABLE ASSIGNMENTS

LSFR'S PAGE NO. 1 ED S4

R0001 CONVENTIONS AND NOTATIONS UTILIZED FOR ERASABLE ASSIGNMENTS.

R0002 EQUALS IS USED IN TWO WAYS. IT IS OFTEN USED TO CHAIN A GROUP
R0003 OF ASSIGNMENTS SO THAT THE GROUP MAY BE MOVED WITH THE
R0004 CHANGING OF ONLY ONE CARD. EXAMPLE.

A0015	X	EQUALS START	
A0006	Y	EQUALS X	+SIZE.X
A0007	Z	EQUALS Y	+SIZE.Y

R0008 (X, Y, AND Z ARE CONSECUTIVE AND BEGIN AT START.)
R0009 (SIZE.X AND SIZE.Y ARE THE RESPECTIVE SIZES OF X AND Y,
R0010 USUALLY NUMERIC, IF. 1, 2, 6, 180 ETC.)

R0011 EQUALS OFTEN IMPLIES THE SHARING OF REGISTERS (DIFFERENT NAMES
R0012 AND DIFFERENT DATA). EXAMPLE.

A0013	X	EQUALS Y
-------	---	----------

R0014 = MEANS THAT MULTIPLE NAMES HAVE BEEN GIVEN TO THE SAME DATA.
R0015 (THIS IS LOGICAL EQUIVALENCE, NOT SHARING) EXAMPLE.

A0016	X	=	Y
-------	---	---	---

R0017 THE SIZE AND UTILIZATION OF AN ERASABLE ARE OFTEN INCLUDED IN
R0018 THE COMMENTS IN THE FOLLOWING FORM. M(SIZE)N.

R0019 M REFERS TO THE MOBILITY OF THE ASSIGNMENT.
R0020 B MEANS THAT THE SYMBOL IS REFERENCED BY BASIC
R0021 INSTRUCTIONS AND THUS IS E-BANK SENSITIVE.
R0022 I MEANS THAT THE SYMBOL IS REFERENCED ONLY BY
R0023 INTERPRETIVE INSTRUCTIONS, AND IS THUS E-BANK
R0024 INSENSITIVE AND MAY APPEAR IN ANY E-BANK.

R0025 SIZE IS THE NUMBER OF REGISTERS INCLUDED BY THE SYMBOL.

R0026 A INDICATES THE NATURE OR PERMANENCE OF THE CONTENTS.
R0027 PL MEANS THAT THE CONTENTS ARE PAGE LOADED.
R0028 DSP MEANS THAT THE REGISTER IS USED FOR A DISPLAY.
R0029 PRM MEANS THAT THE REGISTER IS PERMANENT, IF. IT
R0030 IS USED DURING THE ENTIRE MISSION FOR ONE
R0031 PURPOSE AND CANNOT BE SHARED.
R0032 TPE MEANS THAT THE REGISTER IS USED TEMPORARILY OR
R0033 IS A SCRATCH REGISTER FOR THE ROUTINE TO WHICH
R0034 IT IS ASSIGNED. THAT IS, IT NEED NOT BE SET
R0035 PRIOR TO INVOCATION OF THE ROUTINE NOR DOES IT
R0036 CONTAIN USEFUL OUTPUT TO ANOTHER ROUTINE. THUS

L ERASABLE ASSIGNMENTS

USER'S PAGE NO. 2 EO S4

R0037	IT MAY BE SHARED WITH ANY OTHER ROUTINE WHICH
R0038	IS NOT ACTIVE IN PARALLEL.
R0039	IN MEANS INPUT TO THE ROUTINE AND IT IS PROBABLY
R0040	TEMPERARY FOR A HIGHER-LEVEL ROUTINE/PROGRAM.
R0041	OUT MEANS OUTPUT FROM THE ROUTINE, PROBABLY
R0042	TEMPERARY FOR A HIGHER-LEVEL ROUTINE/PROGRAM.

L FRASAPLE ASSIGNMENTS

USER'S PAGE NO. 3 EO S4

P0043 SPECIAL REGISTERS.

0044	0000	A	EQUALS 0	L AND Q ARE BOTH CHANNELS AND REGISTERS.
0045	0001	L	EQUALS 1	
0046	0002	Q	EQUALS 2	
0047	0003	EBANK	EQUALS 3	
0048	0004	FBANK	EQUALS 4	
0049	0005	Z	EQUALS 5	ADJACENT TO FBANK AND EBANK FOR EXCH 2 (ETCB) AND EXCH FBANK (ETCF).
0050	0006	BBANK	EQUALS 6	
A0051				REGISTER 7 IS A ZERO-SCURCF, USED BY 2L.
0052	0010	ARLPT	EQUALS 10	INTERRUPT STORAGE.
0053	0011	LRUPT	EQUALS 11	
0054	0012	QRLPT	EQUALS 12	SAMPLED TIME 1 & 2. (13 AND 14 ARE SPARES.) USUALLY HOLDS FBANK OR EBANK. RESUME ADDRESS AS WELL.
0055	0013	SAMPTIME	EQUALS 13	
0056	0015	ZRUPT	EQUALS 15	
0057	0016	BANKRLPT	EQUALS 16	
0058	0017	BRUPT	EQUALS 17	
0059	0020	CYR	EQUALS 20	EDITS INTERPRETIVE OPERATION CODE PAIRS.
0060	0021	SR	EQUALS 21	
0061	0022	CYL	EQUALS 22	
0062	0023	ETCP	EQUALS 23	
0063	0024	TIME2	EQUALS 24	REND RADAR TRANNION CDU REND RADAR SHAFI CDU
0064	0025	TIME1	EQUALS 25	
0065	0026	TIME3	EQUALS 26	
0066	0027	TIME4	EQUALS 27	
0067	0030	TIME5	EQUALS 30	
0068	0031	TIME6	EQUALS 31	
0069	0032	CDLX	EQUALS 32	
0070	0033	CFLY	EQUALS 33	
0071	0034	CDLZ	EQUALS 34	
0072	0035	CDLT	EQUALS 35	
0073	0036	CDLS	EQUALS 36	RHC COUNTER REGISTERS
0074	0037	PIPAx	EQUALS 37	
0075	0040	PJPAY	EQUALS 40	
0076	0041	PIPAZ	EQUALS 41	
0077	0042	Q-RHCCTR	EQUALS 42	
0078	0043	P-RHCCTR	EQUALS 43	
0079	0044	R-RHCCTR	EQUALS 44	
0080	0045	INLINK	EQUALS 45	
0081	0046	RARAD	EQUALS 46	
0082	0047	CYROCMD	EQUALS 47	
0083	0050	CDUXCMD	EQUALS 50	RADAR TRANNION COMMAND RADAR SHAFI COMMAND
0084	0051	CDUYCMD	EQUALS 51	
0085	0052	CDUZCMD	EQUALS 52	
0086	0053	CDLTCMD	EQUALS 53	
0087	0054	CDUSCMD	EQUALS 54	

L ERASABLE ASSIGNMENTS

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0088	0055	THRUST	EQUALS 55
0089	0056	LEMONM	EQUALS 56
0090	0057	OUTLINK	EQUALS 57
0091	0060	ALTM	EQUALS 60

R0092 INTERPRETIVE REGISTERS ADDRESSED RELATIVE TO VAC AREA.

0093	0042	LVSQARE	EQUALS 34D	SQUARE OF VECTOR INPUT TO ARVAL AND UNIT
0094	0044	LV	EQUALS 36D	LENGTH OF VECTOR INPUT TO UNIT.
0095	0046	X1	EQUALS 38D	INTERPRETIVE SPECIAL REGISTERS RELATIVE TO THE WORK AREA.
0096	0047	X2	EQUALS 39D	
0097	0050	S1	EQUALS 40D	
0098	0051	S2	EQUALS 41D	
0099	0052	GPRT	EQUALS 42D	

R0100 INPUT/OUTPUT CHANNELS

A0101 *** CHANNEL ZERO IS TO BE USED IN AN INDEXED OPERATION ONLY. ***

0102	REF 1	0001	LOCHAN	EQUALS 1	
0103	REF 1	0002	QCHAN	EQUALS 2	
0104		0003	HISCALAR	EQUALS 3	
0105		0004	LOSCALAR	EQUALS 4	
0106		0005	CHAN5	EQUALS 5	
0107		0006	CHAN6	EQUALS 6	
0108		0007	SUPERENK	EQUALS 7	SUPER-BANK.
0109		0010	OUT0	EQUALS 10	
0110		0011	OSALMOUT	EQUALS 11	
0111		0012	CHAN12	EQUALS 12	
0112		0013	CHAN13	EQUALS 13	
0113		0014	CHAN14	EQUALS 14	
0114		0015	MAKEYIN	EQUALS 15	
0115		0016	NAVKEYIN	EQUALS 16	
0116		0030	CHAN30	EQUALS 30	
0117		0031	CHAN31	EQUALS 31	
0118		0032	CHAN32	EQUALS 32	
0119		0033	CHAN33	EQUALS 33	
0120		0034	DNTM1	EQUALS 34	
0121		0035	DNTM2	EQUALS 35	

R0122 END OF CHANNEL ASSIGNMENTS

L PRASABLE ASSIGNMENTS

USER'S PAGE NO. 5 EO S4

P0123 INTERPRETIVE SWITCH BIT ASSIGNMENTS
A0124

R0125 ** FLAGWORDS AND BITS NOW ASSIGNED AND DEFINED IN THEIR OWN LOG SECTION. **

L ERASABLE ASSIGNMENTS

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R0127 GENERAL ERASABLE ASSIGNMENTS.

0128 0061 SETLCC 61

R0129 INTERRUPT TEMPORARY STORAGE POOL. (11C)

R0131 (ITEMP1 THROUGH RUPTREG4)

R0132 ANY OF THESE MAY BE USED AS TEMPORARIES DURING INTERRUPT OR WITH INTERRUPT INHIBITED. THE ITEMP SERIES
 R0134 IS USED DURING CALLS TO THE EXECUTIVE AND WAITLIST - THE RUPTREGS ARE NOT.

0136 0061 0061 ITEMP1 ERASE
 0137 REF 1 0061 WAITEXIT EQUALS ITEMP1
 0138 REF 2 LAST 95 0061 EXECTEM1 EQUALS ITEMP1

0139 0062 0062 ITEMP2 ERASE
 0140 REF 1 0062 WAITRANK EQUALS ITEMP2
 0141 REF 2 LAST 95 0062 EXECTEM2 EQUALS ITEMP2

0142 0063 0063 ITEMP3 ERASE
 0143 REF 1 0063 RUPTSTOR EQUALS ITEMP3
 0144 REF 2 LAST 95 0063 WAITADR EQUALS ITEMP3
 0145 REF 3 LAST 95 0063 NEWPR10 EQUALS ITEMP3

0146 0064 0064 ITEMP4 ERASE
 0147 REF 1 0064 LCCCTR EQUALS ITEMP4
 0148 REF 2 LAST 95 0064 WAITTEMP EQUALS ITEMP4

0149 0065 0065 ITEMP5 ERASE
 0150 REF 1 0065 NEWLCC EQUALS ITEMP5

0151 0066 0066 ITEMP6 ERASE
 A0152 NEWLCC+1 EQUALS ITEMP6 CP ADDRESS.

0153 0067 0067 SETLCC 67
 0154 0067 0067 NEWJCE ERASE MUST BE AT LOC 67 DUE TO WIRING.

0155 0070 0070 RUPTREG1 ERASE
 0156 0071 0071 RUPTREG2 ERASE
 0157 0072 0072 RUPTREG3 ERASE
 0158 0073 0073 RUPTREG4 ERASE
 0159 REF 1 0073 KEYTEMP1 EQUALS RUPTREG4
 0160 REF 2 LAST 95 0073 CSRUPTEM EQUALS RUPTREG4

R0161 FLAGWORD RESERVATIONS. (16C)

0163 0074 0113 STATE ERASE +15C
 A0164 FLAGWORD REGISTERS.

R0165 P25 RADAR STORAGE. (MAY BE UNSHARDED IN E7) (TEMP OVERLAY) (2D) OVERLAYS FLAGWORD 14 & 15

L FRASABLE ASSIGNMENTS

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0167 RFF 15 LAST 87 0112 LASTXCMD EQUALS STATE +140 E(1)PRM THESE ARE CALLED BY T4RUPT
 0168 RFF 1 0113 LASTXCMD EQUALS LASTXCMD +1 E(1)PRM THEY MUST BE CONTIGUOUS, Y FIRST
 A0169

R0170 EXEC TEMPORARIES WHICH MAY BE USED BETWEEN CCS NEWJOBS. (220) (INTB15+ THROUGH FUPTMXIM)

0172 0114 0114 INTB15+ ERASE REFLECTS 15TH BIT OF INDEXABLE ADDRESSES
 0173 RFF 1 0114 CSFXIT = INTB15+ RETURN FOR CSFIN
 0174 RFF 2 LAST 96 0114 EXITEM = INTB15+ RETURN FOR SCALE FACTOR ROUTINE SELECT
 0175 RFF 3 LAST 96 0114 BLANKRET = INTB15+ RETURN FOR 2BLANK
 0176 0115 0115 INTBIT15 ERASE SIMILAR TO ABOVE.
 0177 RFF 1 0115 WRDRET = INTBIT15 RETURN FOR 5BLANK
 0178 RFF 2 LAST 96 0115 WCRET = INTBIT15 RETURN FOR DSPWD
 0179 RFF 3 LAST 96 0115 DECRET = INTBIT15 RETURN FOR FUTCCM(DEC LCAC)
 0180 RFF 4 LAST 96 0115 21/22REG = INTBIT15 TEMP FOR CHARIN

R0181 THE REGISTERS BETWEEN ADDRWD AND PRIORITY MUST STAY IN THE FOLLOWING ORDER FOR INTERPRETIVE TRACE.

0183 0116 0116 ADDRWD ERASE 12 BIT INTERPRETIVE OPERAND SUB-ADDRESS.
 0184 0117 0117 RCLISH ERASE HOLDS ADDR MADE FROM POLISH ADDRESS.
 0185 RFF 1 0117 UPDATRET = POLISH RETURN FOR UPDATAN, UPCTIVE
 0186 RFF 2 LAST 96 0117 CHAR = POLISH TEMP FOR CHARIN
 0187 RFF 3 LAST 96 0117 ERUNT = POLISH COUNTER FOR ERROR LIGHT RESET
 0188 RFF 4 LAST 96 0117 DECOUNT = POLISH COUNTER FOR SCALING AND DISPLAY (CFC)
 0189 0120 0120 FIXLOC ERASE WORK AREA ADDRESS.
 0190 0121 0121 OVFINC ERASE SET MCN-ZERO ON OVERFLOW.
 0191 0122 0127 VBUF FRASE +5 TEMPORARY STORAGE USED FOR VECTORS.
 0192 RFF 1 0122 SGNEN = VBUF TEMP FOR +, - CN
 0193 RFF 2 LAST 96 0122 NCUNTEM = VBUF COUNTER FOR MIXNCUN FETCH
 0194 RFF 3 LAST 96 0122 CISTEM = VBUF COUNTER FOR COTAL DISPLAY VERBS
 0195 RFF 4 LAST 96 0122 DECTEM = VBUF COUNTER FOR FETCH (CFC DISPLAY VERBS)
 0196 RFF 5 LAST 96 0123 SGNOFF = VBUF +1 TEMP FOR +, - CN
 0197 RFF 6 LAST 96 0123 NVTEMP = VBUF +1 TEMP FOR NVSLB
 0198 RFF 7 LAST 96 0123 SFTMP1 = VBUF +1 STORAGE FOR SF CONST HI PART(=SFTMP2-1)
 0199 RFF 8 LAST 96 0123 FITEMIN = VBUF +1 TEMP FOR LOAD OF HRS, MIN, SEC
 A0200 MUST = LITEMIN-1.
 0201 RFF 9 LAST 96 0124 CODE = VBUF +2 FOR DSPIN
 0202 RFF 10 LAST 96 0124 SFTMP2 = VBUF +2 STORAGE FOR SF CONST LO PART(=SFTMP1+1)
 0203 RFF 11 LAST 96 0124 LITEMIN = VBUF +2 TEMP FOR LOAD OF HRS, MIN, SEC
 A0204 MUST = FITEMIN+1.
 0205 RFF 12 LAST 96 0125 MIXTEMP = VBUF +3 FOR MIXNCUN DATA
 0206 RFF 12 LAST 96 0125 SIGNRET = VBUF +3 RETURN FOR +, - CN

R0207 ALSO MIXTEMP+1 = VBUF+4, MIXTEMP+2 = VBUF+5.

0208 0130 0132 PLF ERASE +2 TEMPORARY SCALAR STORAGE.

L ERASABLE ASSIGNMENTS

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0209					0133	0134	BUF2	ERASE	+1	
0210	REF	1			0130		INDEXLCC	EQUALS	BUF	CONTAINS ADDRESS OF SPECIFIED INDEX.
0211	REF	2	LAST	97	0130		SWWORD	EQUALS	BUF	ADDRESS OF SWITCH WORD.
0212	REF	3	LAST	97	0131		SWFIT	EQUALS	BUF +1	SWITCH BIT WITHIN SWITCH WORD.
0213					0135	0135	MPTMP	ERASE		TEMPORARY USED IN MULTIPLY AND SHIFT.
0214	REF	1			0135		DMPNTEMP	=	MPTMP	DMP SUB TEMPORARY
0215					0136	0136	DCTINC	ERASE		COMPONENT INCREMENT FOR DCT SUBROUTINE.
0216	REF	1			0136		DVSIGN	EQUALS	DCTINC	DETERMINES SIGN OF DCV RESULT.
0217	REF	2	LAST	97	0136		ESCAPE	EQUALS	DCTINC	USED IN ARCSIN/ARCCOS.
0218	REF	3	LAST	97	0136		ENTRET	=	DCTINC	EXIT FROM ENTER
0219					0137	0137	DCTRET	ERASE		RETURN FROM DCT SUBROUTINE.
0220	REF	1			0137		DVNORMCT	EQUALS	DCTRET	DIVIDEND NORMALIZATION COUNT IN DCV.
0221	REF	2	LAST	97	0137		ESCAPE2	EQUALS	DCTRET	ALTERNATE ARCSIN/ARCCOS SWITCH.
0222	REF	3	LAST	97	0137		WDCNT	=	DCTRET	CHAP COUNTER FOR DSPWC
0223	REF	4	LAST	97	0137		INRFL	=	DCTRET	INRUT BUFFER SELECTOR (X,Y,Z, REG)
0224					0140	0140	MATINC	ERASE		VECTOR INCREMENT IN MXV AND VXM.
0225	REF	1			0140		MAXCVSW	EQUALS	MATINC	+0 IF DP QUOTIENT IS NEAR ONE - ELSE -1.
0226	REF	2	LAST	97	0140		PCLYCNT	EQUALS	MATINC	PCLYNOMIAL LCCP COUNTER
0227	REF	3	LAST	97	0140		DSPMMTEM	=	MATINC	DSPCCLNT SAVE FOR DSPMM
0228	REF	4	LAST	97	0140		MIXPR	=	MATINC	INDICATOR FOR MIXED OR NORMAL NCUN
0229					0141	0141	TEM1	ERASE		EXEC TEMP
0230	REF	1			0141		PCLYRET	=	TEM1	
0231	REF	2	LAST	97	0141		DSREL	=	TEM1	REL ADDRESS FOR DSPIN
0232					0142	0142	TEM2	ERASE		EXEC TEMP
0233	REF	1			0142		DSMAC	=	TEM2	MAGNITUDE STORE FOR DSPIN
0234	REF	2	LAST	97	0142		IDADDTEM	=	TEM2	MIXNCUN INDIRECT ADDRESS STORAGE
0235					0143	0143	TEM3	ERASE		EXEC TEMP
0236	REF	1			0143		CCUNT	=	TEM3	FOR DSPIN
0237					0144	0144	TEM4	ERASE		EXEC TEMP
0238	REF	1			0144		LSTPTR	=	TEM4	LIST POINTER FOR GRABLSY
0239	REF	2	LAST	97	0144		RELRET	=	TEM4	RETURN FOR RELCSP
0240	REF	3	LAST	97	0144		FPECRET	=	TEM4	RETURN FOR FREEDSP
0241	REF	4	LAST	97	0144		CSRWCRET	=	TEM4	RETURN FOR DSPSIGN
0242	REF	5	LAST	97	0144		SFPSCRET	=	TEM4	RETURN FOR SFPSEC
0243	REF	6	LAST	97	0144		SFPMNRET	=	TEM4	RETURN FOR SFPMIN
0244					0145	0145	TEM5	ERASE		EXEC TEMP
0245	REF	1			0145		NCUNADD	=	TEM5	TEMP STORAGE FOR NCUN ADDRESS
0246					0146	0146	ANACTEM	ERASE		TEMP FOR NCUN ADDRESS TABLE ENTRY
0247					0147	0147	ANITYTEM	ERASE		TEMP FOR NCUN TYPE TABLE ENTRY
0248					0150	0150	IDAD1TEM	ERASE		TEMP FOR INDIC ADDRESS TABLE ENTRY (MIXNN)
A0249										MUST = IDAD2TEM-1, = IDAD3TEM-2.
0250					0151	0151	IDAD2TEM	ERASE		TEMP FOR INDIC ADDRESS TABLE ENTRY (MIXNN)

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A0251
 0252 0152 0152 IDAD3TEM ERASE MUST = ICAD1TEM+1, = ICAD3TEM-1.
 A0253 TEMP FOR INDIR ADDRESS TABLE ENTRY(MIXNN)
 0254 0153 0153 RLTPXTEM ERASE MUST = ICAD1TEM+2, = ICAD2TEM+1.
 TEMP FOR SF PCUT TABLE ENTRY(MIXNN ONLY)

R0255 AX*SR*ST STORAGE. (6C)

0257 RFF 3 LAST 97 0142 DFXDEX EQUALS TEM2 E(1)TMP
 0258 RFF 2 LAST 97 0143 DEX1 EQUALS TEM3 E(1)TMP
 0259 RFF 7 LAST 97 0144 DFX2 EQUALS TEM4 E(1)TMP
 0260 RFF 2 LAST 97 0145 RTNSAVER EQUALS TEM5 E(1)TMP
 0261 RFF 1 0157 TERMLTMP EQUALS MFAC +3 E(2)TMP

0262 RFF 1 0142 DEX1 = DEX1

R0263 THE FOLLOWING 10 REGISTERS ARE USED FOR TEMPORARY STORAGE OF THE DERIVATIVE COEFFICIENT TABLE OF
 R0265 SUBROUTINE ROOTPSRS. THEY MUST REMAIN WITHOUT INTERFERENCE WITH ITS SUBROUTINES WHICH ARE POWRSRS (PCLY),
 R0267 DMPSEB, DMPNSUB, SHORTMP, DEV/EDCV, AFS, AND USEFCADR.

0268 RFF 2 LAST 98 0142 DERCCF-8 = MFAC -12 RCCTPSRS DER CCF N-4 HI CRDER
 0269 RFF 3 LAST 98 0143 DERCOF-7 = MPAC -11 RCCTPSRS DER COF N-4 LC CRDER
 0270 RFF 4 LAST 98 0144 DERCCF-6 = MFAC -10 RCCTPSRS DER CCF N-3 HI CRDER
 0271 RFF 5 LAST 98 0145 DERCOF-5 = MPAC -7 RCCTPSRS DER COF N-3 LC CRDER
 0272 RFF 6 LAST 98 0146 DEPCCF-4 = MPAC -6 ROOTPSRS DER COF N-2 HI CRDER
 0273 RFF 7 LAST 98 0147 DEPCCF-3 = MFAC -5 RCCTPSRS DER COF N-2 LC CRDER
 0274 RFF 8 LAST 98 0150 DERCCF-2 = MPAC -4 RCCTPSRS DER CCF N-1 HI CRDER
 0275 RFF 9 LAST 98 0151 DERCCF-1 = MFAC -3 ROOTPSRS DER CCF N-1 LC CRDER
 0276 RFF 10 LAST 98 0152 DERCCFN = MFAC -2 RCCTPSRS DER CCF N HI CRDER
 0277 RFF 11 LAST 98 0153 DEPCCF+1 = MPAC -1 RCCTPSRS DER CCF N LC CRDER

 0278 RFF 5 LAST 96 0117 PWRPTR = PCLISH RCCTPSRS POWER TABLE PCINTER
 0279 RFF 14 LAST 96 0124 DXCRIT = VBUF +2 RCCTPSRS CRITERION FOR ENDING ITERS HI
 0280 RFF 15 LAST 98 0125 DXCRIT+1 = VBUF +3 RCCTPSRS CRITERION FOR ENDING ITERS LC
 0281 RFF 16 LAST 98 0126 RCCTPS = VBUF +4 RCCTPSRS ROOT HI CRDER
 0282 RFF 17 LAST 98 0127 ROOTPS+1 = VBUF +5 RCCTPSRS ROOT LC CRDER
 0283 RFF 4 LAST 97 0132 RETRCCT = RUF +2 ROOTPSRS RETURN ADDRESS OF USER
 0284 RFF 5 LAST 97 0140 PWRCNT = MATINC RCCTPSRS DER TABLE LCCF CCOUNTER
 0285 RFF 3 LAST 97 0141 CFPPTR = TEN1 RCCTPSRS DER TABLE PCINTER

A0286

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P0287 DYNAMICALLY ALLOCATED CORE SETS FOR JOES.

(84D)

0289		0154	0162	MFAC	ERASE	+6	MULTI-PURPOSE ACCUMULATOR.
0290		0163	0163	MODE	ERASE		+1 FOR TP, +0 FOR DP, OR -1 FOR VECTOR.
0291		0164	0164	LCC	ERASE		LOCATION ASSOCIATED WITH JOB.
0292		0165	0165	BANKSET	ERASE		USUALLY CONTAINS BBANK SETTING.
0293		0166	0166	PUSHLOC	ERASE		WORD OF PACKED INTERPRETIVE PARAMETERS.
0294		0167	0167	PRIORITY	ERASE		PRIORITY OF PRESENT JOB AND WORK AREA.
0295		0170	0313		ERASE	+83D	EIGHT SETS OF 12 REGISTERS EACH

R0297 INCORP STORAGE: R22 (N29) (SHARES WITH FOLLOWING SECTION)

(4C)

0299	REF	1		0314	R22DISP	EQUALS	TIME2SAV	I(4) N49 DISPLAY OF DELTA R AND DELTA V
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R0311 STANDBY VERT ERASABLES. REDOCTR BEFORE THETACS.

(14C)

0323				0314	0315	TIME2SAV	ERASE	+1	
0304				0316	0317	SCALSAVE	ERASE	+1	
0305				0320	0321	REDOCTR	ERASE		CONTAINS NUMBER OF RESTARTS
0306				0321	0323	THETAC	ERASE	+2	
0307	REF	1		0321		CPHI	=	THETAC	C DESIRED GIMBAL ANGLES
0308	REF	2	LAST	99	0322	CTHETA	=	THETAC +1	I FOR
0309	REF	3	LAST	99	0323	CPSI	=	THETAC +2	M MANEUVER.
0310				0324	0331	DELV	ERASE	+5	
0311	REF	1			0324	DELVX	=	DELV	
0312	REF	2	LAST	99	0326	DELVY	=	DELV +2	
0313	REF	3	LAST	99	0330	DELVZ	=	DELV +4	

A0314

R0315 WAITLIST REPEAT FLAG

(1C)

0317				0332	0332	RUPTAGN	ERASE		
0318	REF	1			0332	KEYTFNF2	=	PLPTAGN	TEMP FOR KEYRLPT, UPLPT

A0319

R0320 DOWNLINK STORAGE.

(27C)

0322	REF	1		0332		DNLSTADR	EQUALS	DNLSTCCD	
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0323				0333	0333	DNLSTCCD	ERASE		B(1)PRM DOWNLINK LIST CODE
0324				0334	0365	LDATALST	ERASE	+25C	(26C)
0325	REF	1		0335		DNTMGCTC	EQUALS	LDATALST +1	8(1)
0326	REF	1		0336		TMINDEX	EQUALS	DNTMGCTC +1	8(1)
0327	REF	1		0336		CUMPLCC	EQUALS	TMINDEX	CONTAINS EACH OF AGC CP WORD BEING DUMP

A0328									ED AND COUNT OF COMPLETE CUMPS ALREADY S
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A0329

0330	REF	2	LAST	99	0337	DNQ	EQUALS	TMINDEX +1	P(1)
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0331 REF 1 340 ENTMBUFF EQUALS DNG +1 B(22)PRM DOWNLINK SNAPSHOT BUFFER

R0332 UNSWITCHED FOR DISPLAY INTERFACE ROUTINES. (100) FIVE MORE IN EBANK 2

0334 0366 0366 RESTREG ERASE B(1)PRM FOR DISPLAY RESTARTS

0335 0367 0367 NVWCRC ERASE

0336 0370 0370 MARKAV ERASE

0337 0371 0371 NVSAVE ERASE

R0338 (RETAIN THE ORDER OF CACRFLSH TO FAILREG +2 FOR DOWNLINK PURPCSES)

0340 0372 0372 CACRFLSH ERASE

0341 0373 0373 CACRMARK ERASE

0342 0374 0374 TFMPLSH ERASE

0343 0375 0377 FAILREG ERASE +2 B(3)PRM 3 ALARM CODE REGISTERS

R0344 VAC AREAS. -BE CAREFUL OF PLACEMENT- (220D)

0346 0400 0400 VAC1USE ERASE

0347 0411 0452 VAC1 ERASE +42D

0348 0454 0454 VAC2USE ERASE

0349 0455 0527 VAC2 ERASE +42D

0350 0530 0530 VAC3USE ERASE

0351 0531 0603 VAC3 ERASE +42D

0352 0604 0604 VAC4USE ERASE

0353 0605 0657 VAC4 ERASE +42D

0354 0660 0660 VAC5USE ERASE

0355 0661 0733 VAC5 ERASE +42D

R0356 STAPALIGN ERASABLES. (130)

0358 0734 0734 STAPCODE ERASE (1)

0359 REF 1 0734 ACTCCDE = STARCCDE

0360 0735 0750 STARALGN ERASE +11D

0361 REF 1 0735 SINCCU = STARALGN

0362 REF 2 LAST 100 0743 CCSCCL = STARALGN +6

0363 REF 1 0741 SINCDLX = SINCDL +4

0364 REF 2 LAST 100 0735 SINCCLY = SINCCU

0365 REF 3 LAST 100 0737 SINCDLZ = SINCDL +2

0366 REF 1 0747 COSCDUX = COSCDL +4

0367 REF 2 LAST 100 0743 COSCDUY = COSCDL

0368 REF 3 LAST 100 0745 COSCDLZ = COSCDL +2

R0369 PHASE TABLE AND RESTART COUNTERS. (120)

0371 0751 0751 -PHASE1 ERASE

0372 0752 0752 -PHASE1 ERASE

0373 0753 0753 -PHASE2 ERASE

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0374	0754	0754	PHASE2	ERASE
0375	0755	0755	-PHASE3	ERASE
0376	0756	0756	PHASE3	ERASE
0377	0757	0757	-PHASE4	ERASE
0378	0760	0760	PHASE4	ERASE
0379	0761	0761	-PHASE5	ERASE
0380	0762	0762	PHASE5	ERASE
0381	0763	0763	-PHASE6	ERASE
0382	0764	0764	PHASE6	ERASE

R0383 A**SP#T STORAGE. (6C)

0385 0765 0772 CDUSPOT ERASE +5 E(6)

0386	REF	1		0765	CDUSPOTY =	CDUSPOT
0387	REF	2	LAST 101	0767	CDUSPCTZ =	CDUSPCT +2
0388	REF	3	LAST 101	0771	CDUSROTX =	CDUSPCT +4

R0389 VERB 37 STORAGE. (2C)

0391	0773	0773	MINDEX	ERASE	B(1) TMP INDEX FOR MAJOR MODE
0392	0774	0774	MMNUMER	ERASE	B(1) TMP MAJOR MODE REQUESTED BY V37

R0393 PINBALL INTERRUPT ACTION. (1C)

0395 0775 0775 DSPCNT ERASE B(1)PRM COUNTER FOR DSPCNT.

R0396 PINBALL EXECUTIVE ACTION (44C)

0398	0776	0776	DSPCNT	ERASE	DISPLAY POSITION INDICATOR.	
0399	0777	0777	DECBNCH	ERASE	+DEC, - DEC, OCT INDICATOR	
0400	1000	1000	VERBREG	ERASE	VERB CODE	
0401	1001	1001	NOINREG	ERASE	ACUM CODE	
0402	1002	1002	XREG	ERASE	R1 INFLT BUFFER	
0403	1003	1003	YREG	ERASE	P2 INFLT BUFFER	
0404	1004	1004	ZREG	ERASE	R3 INFLT BUFFER	
0405	1005	1005	XREGLP	ERASE	LD PART OF XREG (FOR DEC CONV ONLY)	
0406	1006	1006	YREGLP	ERASE	LC PART OF YREG (FOR DEC CONV ONLY)	
0407	REF	1		1006	ITEMCUT =	YREGLP
A0408						TEMP FOR DISPLAY OF HRS, MIN, SEC
0409				1007	1007	ZREGLP
0410	REF	1		1007	1007	LCITEMCUT =
A0411						TEMP FOR DISPLAY OF HRS, MIN, SEC
0412				1010	1010	MODE REG
0413				1011	1011	DSPLOCK
0414				1012	1012	REQRET

MODE CODE
KEYBOARD/SUBROUTINE CALL INTERLOCK
RETURN REGISTER FOR LOAD

L ERASABLE ASSIGNMENTS

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0415	1013	1013	LOADSTAT	ERASE		STATUS INDICATOR FOR LOAD1ST
0416	1014	1014	CLPASS	ERASE		PASS INDICATOR CLEAR
0417	1015	1015	NOOUT	ERASE		ACTIVITY COUNTER FOR DSPTAB
0418	1016	1016	NCUNCADR	ERASE		MACHINE CADR FOR NOUN
0419	1017	1017	MONSAVE	ERASE		N/V CODE FOR MONITER. (= MONSAVE1-1)
0420	1020	1020	MONSAVE1	ERASE		NCUNCADR FOR MONITOR(MATBS) =MONSAVE +1
0421	1021	1021	MONSAVE2	ERASE		NVMONCFT OPTIONS
0422	1022	1025	DSPTAE	ERASE	+11D	C-10D, DISPLAY PANEL BUFF. 11D, C/S LTS.
0423	1036	1036	NVQTEM	ERASE		NVSUB STORAGE FOR CALLING ADDRESS
A0424						MUST = NVBNKTEM-1
0425	1037	1037	NVENKTEM	ERASE		NVSLB STORAGE FOR CALLING BANK
A0426						MUST = NVQTEM+1
0427	1040	1040	VFRBSAVE	ERASE		NEEDED FOR RECYCLE
0428	1041	1041	CACFSTCR	ERASE		ENDIDLE STORAGE
0429	1042	1042	DSPLIST	ERASE		WAITING REG FOR DSP SYST INTERNAL USE
0430	1043	1043	EXTVBACT	ERASE		EXTENDED VERB ACTIVITY INTERLOCK
0431	1044	1046	DSPTM1	ERASE	+2	BUFFER STORAGE AREA 1 (MOSTLY FOR TIME)
0432	1047	1051	DSPTM2	ERASE	+2	BUFFER STORAGE AREA 2 (MOSTLY FOR DEG)

0433	REF	1	1050	DSPTMX	EQUALS DSPTM2	+1	B(2) S-S DISPLAY BUFFER FOR EXT. VERBS
0434	REF	1	1044	NORMTEM1	EQUALS DSPTM1		B(3) DSP NORMAL DISPLAY REGISTERS.
A0435							

RD436	DISPLAY FOR EXTENDED VERBS (V82, R04(V62), V41(N72))					(2C)
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0438	REF	1	1050	OPTIONX	EQUALS DSPTMX		(2) EXTENDED VERB OPTION CODE
A0439							

RD440	TBASES AND PHSPRDT S.					(12C)
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0442	1052	1052	TRASF1	ERASE	
0443	1053	1053	PHSPRDT1	ERASE	
0444	1054	1054	TRASE2	ERASE	
0445	1055	1055	PHSPRDT2	ERASE	
0446	1056	1056	TRASE3	ERASE	
0447	1057	1057	PHSPRDT3	ERASE	
0448	1060	1060	TRASE4	ERASE	
0449	1061	1061	PHSPRDT4	ERASE	
0450	1062	1062	TBASE5	ERASE	
0451	1063	1063	PHSPRDT5	ERASE	
0452	1064	1064	TRASE6	ERASE	
0453	1065	1065	PHSPRDT6	ERASE	

RD454	UNSWITCHED FOR DISPLAY INTERFACE ROUTINES.					(6C)
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0456	1066	1066	NVWORD1	ERASE		B(1) FREQUABLY FOR DISPLAY DURING SERVICER
0457	1067	1067	EEANKSAV	ERASE		

L ERASABLE ASSIGNMENTS

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0458	1070	1070	MARKFEAN	ERASE
0459	1071	1071	EEANKTEM	ERASE
0460	1072	1072	MARK2PAC	ERASE
0461	1073	1073	RISAVE	ERASE

R0462 IMU COMPENSATION UNSWITCHED ERASABLE. (10)

0464	1074	1074	1/PIPADT	ERASE
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A0465

R0466 SINGLE PRECISION SUBROUTINE TEMPORARIES. (20)

0468	1075	1075	TEMK	ERASE	(1)
0469	1076	1076	SG	ERASE	(1)

A0470

R0471 UNSWITCHED RADAR ERASABLE (130)

0473	1077	1077	SAMPLIM	ERASE
0474	1102	1103	SAMPLSUM	ERASE +3
0475	1104	1105	TIMEHOLD	ERASE +1
0476	REF	1	RRTARGET	EQUALS SAMPLSUM
0477	1106	1107	TANG	ERASE +1
0478	REF	1	MCDCA	EQUALS TANG
0479	1110	1111	MCDER	ERASE +1
0480	REF	1	NSAMP	EQUALS MCDEB
0481	1112	1112	DESRET	ERASE
0482	REF	1	OLDATAGC	EQUALS DESRET
0483	1113	1113	DRSCOUNT	ERASE

HALF L IT VECTOR IN SM CR NB AXES.
DESIRE TRUNNICK AND SFAFT ANGLES.

DCDES LCRBERS TANG +2.

USED I DATA READING ROUTINES.

RC484 ***** P22 ***** (60)

0486	REF	1	1100	RSUBC	EQUALS RRTARGET
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I(6)S-S CSM POSITION VECTOR

AC487

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R0488 UNSWITCHED FOR CREDIT INTEGRATION. (210)

0490			1114	1140	TDEC	ERASE	+200	I(2)
0491	REF	1	1116		COLREG	EQUALS	TDEC +2	I(1)
0492	REF	1	1117		LAT	EQUALS	COLREG +1	I(2)
0493	REF	1	1121		LONG	EQUALS	LAT +2	I(2)
0494	REF	1	1123		ALT	EQUALS	LONG +2	I(2)
0495	REF	1	1125		YV	EQUALS	ALT +2	I(6)
0496	REF	1	1132		ZV	EQUALS	YV +6	I(6)

A0497

R0498 MISCELLANEOUS UNSWITCHED. (200)

0500			1141	1141	P4VRET	ERASE		(WILL BE PUT IN E6 WHEN THERE IS ROOM)
0501			1142	1142	GENRET	ERASE		B(1) RETN CADR.
0502			1143	1143	CPTICN1	ERASE		E(1) NCUN 06 USES THIS
0503			1144	1144	OPTION2	ERASE		B(1) NCUN 06 USES THIS
0504			1145	1145	OPTICN3	ERASE		B(1) NCUN 06 USES THIS
0505			1146	1147	LONGCADP	ERASE	+1	B(2) LONGCALL REGISTER
0506			1150	1151	LONGBASE	ERASE	+1	
0507			1152	1153	LONGTIME	ERASE	+1	B(2) LONGCALL REGISTER
0508			1154	1154	CDUTEMPX	ERASE		E(1)TMP
0509			1155	1155	CDUTEMPY	ERASE		B(1)TMP
0510			1156	1156	CDUTEMPZ	ERASE		B(1)TMP
0511			1157	1157	PIPATMPX	ERASE		E(1)TMP
0512			1160	1160	PIFATMPY	ERASE		B(1)TMP
0513			1161	1161	PIPATMPZ	ERASE		B(1)TMP
0514			1162	1162	DISPDFX	ERASE		B(1)
0515			1163	1163	TEMPR60	ERASE		B(1)
0516			1164	1164	PRIDTIME	ERASE		B(1)

R0517 P27 (UPDATE PROGRAM) STORAGE. (260)

0519			1165	1165	UPVERSV	ERASE		E(1) UPDATE VERB ATTEMPTED.
0520			1166	1216	UPTMP	ERASE	+240	B(1)TMP SCRATCH
0521	REF	1	1166		INTWAK10	EQUALS	UPTMP	(BCROWS UPTMP REGISTERS)
R0522	RETAIN THE ORDER OF COMPNUMB THRU LPRUFF +190 FOR DOWNLINK PURPOSES.							
0523	REF	2	1167		COMPNUMB	EQUALS	UPTMP +1	B(1)TMP NUMBER OF ITEMS TO BE UPLINKED
0524	REF	1	1170		UPCLMCC	EQUALS	COMPNUMB +1	B(1)TMP INTERRUPTED PROGRAM MM
0525	REF	1	1171		UPVERB	EQUALS	UPCLMCC +1	B(1)TMP VERB NUMBER
0526	REF	1	1172		UPCLCNT	EQUALS	UPVERB +1	B(1)TMP LPRUFF INDEX
0527	REF	1	1173		UPBLFF	EQUALS	UPCLCNT +1	B(200)

A0528

R0529 SPECIAL DEFINITION FOR SYSTEM TEST ERASABLE PGMS. (20)

0531	REF	3	1166		EBUF2	EQUALS	UPTMP	B(2) FOR EXCLUSIVE USE OF SYSTEM TEST
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A0532

L ERASABLE ASSIGNMENTS

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R0533	PERM STATE VECTORS FOR BECST AND DOWNLINK-WFCLE MISSION-					(14C)
0535		1217	1224	PN	ERASE +5	B(6)PRM
0536		1225	1232	VM	EPASE +5	B(6)PRM
0537		1233	1234	PIPTIME	ERASE +1	B(2)PRM (MUST BE FOLLOWED BY GET/2)

R0538	SERVICER -MUST FOLLOW PIPTIME-					(18D)
0540		1235	1256	GDT/2	ERASE +17D	B(6)TMP ** MUST FOLLOW PIPTIME **
0541	REF	1	1243	MASS	EQUALS GDT/2 +6	B(2)
0542	REF	1	1243	WEIGHT/C	= MASS	
0543	REF	2	1245	ABDELV	EQUALS MASS +2	ALCMANU STORAGE)
0545	REF	1	1246	PCLIDE	EQUALS ABDELV +1	(2)
0546	REF	1	1250	DVTHRUSH	EQUALS PCLIDE +2	(1)
0547	REF	1	1251	AVEGEXIT	EQUALS DVTHRUSH +1	(2)
0548	REF	1	1251	AVEGEXIT	= AVEGEXIT	
0549	REF	2	1253	TEMX	EQUALS AVEGEXIT +2	(1)
0550	REF	1	1254	TEMY	EQUALS TEMX +1	(1)
0551	REF	1	1255	TEMZ	EQUALS TEMY +1	(1)
0552	REF	1	1256	PIPAGE	EQUALS TEMZ +1	B(1)

AC553

R0554	PERMANENT LM DAP STORAGE.					(6C)
0556		1257	1257	CF5MASK	ERASE	B(1)PRM
0557		1260	1260	CF6MASK	ERASE	B(1)PRM JET FAILURE MASK.
0558		1261	1261	SPNDX	ERASE	B(1)
0559		1262	1262	RCSFLGS	ERASE	ALTCPLCT FLAG WORD
A0560						RIT ASSIGNMENTS:
A0561						1) ALTERYZ SWITCH (ZEPCCP1)
A0562						2) NEEDLER SWITCH
A0563						3) NEEDLER SWITCH
A0564						4) NEEDLER SWITCH
A0565						5) NEEDLER SWITCH
A0566						9) JUST-IN-DETENT SWITCH
A0567						10) PBIT - MANUAL CONTROL SWITCH
A0568						11) QRBIT - MANUAL CONTROL SWITCH
A0569						12) PSKIF CONTROL (PJUMPAIR)
A0570						13) 1/ACCJCB CONTROL (ACCSET)
0571		1263	1264	T5ACP	ERASE +1	GENADR OF NEXT LM DAP T5RUP1. * 2CADR *
A0572						BCCCN OF NEXT LM DAP T5RUP1. 2CADR

R0573	ERASABLES FOR RADAR READ PROTECTION (C13STALL)					(4C)
0575		1265	1265	C13QSAV	ERASE	B(1) GSAVE FOR C13STALL USERS.
0576		1266	1266	C13FSAV	ERASE	B(1) FBANK SAVE FOR C13STALL.
0577		1267	1267	RACTIME	ERASE	B(1) NEG. TIME OF SCALAR READ.

L ERASABLE ASSIGNMENTS

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0578		1270	1270	RACCEL	ERASE		B(1) DELTA TIME FROM SCALAR READ TO T5.
A0579							

R0580	RACAREAD STORAGE						(2C)
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0582		1271	1272	TTCTIC	ERASE +1		B(2) LATEST ESTIMATE OF TIME TO IGNITION
A0583							

R0584	RCS FAILURE MONITOR STORAGE						(1)
0586		1273	1273	PVALVEST	ERASE		B(1) PRM

R0587	KALCMANU/CAP INTERFACE.						(3C)
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0589		1274	1274	DELPERCR	ERASE		B(1)PRM COMMAND LAGS.
0590		1275	1275	DELQRCR	ERASE		B(1)PRM
0591		1276	1276	DELRRCR	ERASE		B(1)PRM

R0592	MODE SWITCHING ERASABLE.						(5C)
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R0594	RETAIN THE ORDER OF IMODES20 AND IMODES33 FOR DOWNLINK PURPOSES.						
0595		1277	1277	IMODES30	ERASE		B(1)
0596		1300	1300	IMODES33	ERASE		
0597		1301	1302	MODECADR	ERASE +2		B(3)PRM
0598	REF 1	1301		IMUCADR	EQUALS MODECADR		
0599	REF 2 LAST 106	1302		CPTCADR	EQUALS MODECADR +1		
0600	REF 3 LAST 176	1303		RAPCADR	EQUALS MODECADR +2		
0601		1304	1306	ATTCADR	ERASE +2		B(3)PRM
0602	REF 1	1306		ATTPRIC	= ATTCADR +2		
0603		1307	1307	MARKSTAT	ERASE		

R0604	T4RUPT ERASABLE.						(2C)
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0606		1310	1310	DSRUPTSW	ERASE		
0607		1311	1311	LCYRC	ERASE		(1)

R0608	RENDEZVOUS RADAR TASK STORAGE						(3C)
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0610		1312	1314	RRRET	ERASE +20		B(1)TMP P20'S, PERHAPS R29 & R12
0611	REF 1	1313		RCFS	EQUALS RRRET +1		B(1)TMP
0612	REF 1	1314		RPINDEX	EQUALS RCFS +1		B(1)TMP
A0613							

R0614	MEASINC						(4C)
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0616		1315	1315	WIXA	ERASE		P(1)
0617		1316	1316	WIXB	ERASE		B(1)
0618		1317	1317	ZIXA	ERASE		P(1)

L ERASABLE ASSIGNMENTS

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0619 1320 1320 ZIXE ERASE B(1)

R0620 AGS DUMMY TD WORD. (1C)

0622 1321 1321 AGSWORD ERASE

R0623 SOME MISCELLANEOUS UNSWITCHED. (6C)

0625 1322 1322 RATEINDX ERASE (1) USED BY KALCMANU

0626 1323 1325 DELAYLOC EPASF +2

0627 1326 1326 LEMMASS ERASE KEEP CONTIGUOUS W. CSMMASS (1) EACH

0628 1327 1327 CSMMASS ERASE

R0629 LESS IS MORE.

R0630 RENDEZVOUS AND LANDING RADAR DOWNLINK STORAGE. (7C)

R0632 (NORMALLY USED DURING P20, BUT MAY ALSO)

R0633 (BE REQUIRED FOR THE V62 SPURIOUS TEST.)

R0634 (PLEASE KEEP IN THIS ORDER)

0635 1330 1336 DNPRANGE ERASE +6 B(1) TMP

0636 REF 1 1331 DNRRDCT EQUALS DNPRANGE +1 B(1)TMP

0637 REF 1 1332 DNINDEX EQUALS DNRRDCT +1 B(1)TMP

0638 REF 1 1333 DNLRVELX EQUALS DNINDEX +1 B(1)TMP

0639 REF 1 1334 DNLRVELY EQUALS DNLRVELX +1 B(1)TMP

0640 REF 1 1335 DNLRVELZ EQUALS DNLRVELY +1 B(1)TMP

0641 REF 1 1336 DNLRALT EQUALS DNLRVELZ +1 B(1) TMP

R0642 INCORPORATION UNSWITCHED. (2C)

0644 REF 1 1256 W.IND EQUALS PIFAGE B(1)

0645 REF 1 1257 W.IND1 EQUALS W.IND +1 I(1)

R0646 SUBROUTINE BALLINGS OF R60. (1D)

0648 1337 1337 BALLEXT ERASE B(1)SAVE LOCATION FOR BALLINGS SUBR EXIT

R0649 SOME LEM DAP STORAGE. (4C)

0651 1340 1340 DAPDATR1 ERASE B(1)DSP DAP CONFIG.

0652 1341 1342 TFEVENT ERASE +1 B(2)DSP

0653 1343 1343 DF ERASE B(1)TMP DEAD BAND.

A0654

R0655 ACUN 87 (2C)

L ERASABLE ASSIGNMENTS

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0657		1344	1345	AZ	ERASE	+10	B(1)	AZ AND EL MUST BE CONTIGUOUS
1658	REF	1	1345	EL	EQUALS	AZ +10	B(1)	
A0659								

R0660							(10)	
0662			1346	1346	WCFPHASE	ERASE	B(1)	
A0662								

R0664							(20)	
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0666			1347	1347	E3J22R2M	ERASE	I(1)	
0667			1350	1350	E32C31RM	ERASE	I(1)	
A0668								

R0669							(30)	
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1671			1351	1352	PADSKAL	ERASE	+1	LR ALT DOPPLER BIAS : 2T/LAMBDA SCALED
A0672								AT 1/(2(7) M/CS)
0673			1353	1353	SKALSKAL	ERASE		LR ALT SCALE FACTOR RATIO : .2 NCM
A0674								

R0675							(20)	
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0677			1354	1354	TRUNNCMD	ERASE		*** THESE TWO ERASABLES ***
0678			1355	1355	SHAFTCMD	ERASE		*** MUST BE IN ORDER ***
A0679								

R06792							(10)	
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06796			1356	1356	WCFREAD	ERASE	B(1)	TMP MEASUREMENT BEING PROCESSED.
A06798								

0680			1377		END-LE	EQUALS	1377	
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R0681							(170)	
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R0683							(DO NOT MOVE, S-C IS ADDRESS SENSITIVE)	
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0684			1357	1377	SELFERS	FRASE	1357 - 1377	*** MUST NOT BE MOVED ***
0685	REF	1	1357		SFAIL	EQUALS	SELFERS	B(1)
0686	REF	1	1360		FRESTCKE	EQUALS	SFAIL +1	B(1)
0687	REF	1	1361		SELFRET	EQUALS	FRESTORE +1	B(1) RETURN
0688	REF	1	1362		SMODE	EQUALS	SELFRET +1	B(1)
0689	REF	1	1363		ALMCADR	EQUALS	SMODE +1	B(2) ALARM-ACRT USER'S 2CADR
0690	REF	1	1365		ERCOUNT	EQUALS	ALMCADR +2	B(1)
0691	REF	1	1366		SCOUNT	EQUALS	ERCOUNT +1	B(3)
0692	REF	1	1371		SKEEP1	EQUALS	SCOUNT +2	B(1)
0693	REF	1	1372		SKEEP2	EQUALS	SKEEP1 +1	B(1)
0694	REF	1	1373		SKEEP3	EQUALS	SKEEP2 +1	B(1)

L ERASABLE ASSIGNMENTS

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0695	REF	1	1374	SKEEP4	EQUALS	SKEEP3	+1	B(1)
0696	REF	1	1375	SKEEP5	EQUALS	SKEEP4	+1	B(1)
0697	REF	1	1376	SKEEP6	EQUALS	SKEEP5	+1	B(1)
0698	REF	1	1377	SKEEP7	EQUALS	SKEEP6	+1	B(1)

ERASABLE ASSIGNMENTS

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P0699 ERANK-3 ASSIGNMENTS

0700 E3,1400 SETLCC I400

R0701 WAITLIST TASK LISTS. (26D)

0703 E3,1406 E3,1407 LST1 ERASE +7 E(ED)PRM CFLT4 T S.
 0704 E3,1410 E3,1431 LST2 ERASE +17C B(1ED)PRM TASK 20ADR ADDRESSES.

R0705 RESTART STORAGE. (2C)

0707 E3,1432 E3,1433 RSPBQ ERASE +1 B(2)PRM SAVE BR AND C FOR RESTARTS.

R0708 MORE LONGCALL STORAGE. (MLST RE IN LST1 S BANK. (2C)

0710 E3,1434 E3,1435 LONGEXIT ERASE +1 B(2)TMP MAY BE SELDCM OVERLAYED.

R0711 PHASE-CHANGE LISTS PART II. (12D)

0713 E3,1436 E3,1436 PHSNAME1 ERASE B(1)PRM
 0714 E3,1437 E3,1437 PHSBE1 ERASE B(1)PRM
 0715 E3,1440 E3,1440 PHSNAME2 ERASE E(1)PRM
 0716 E3,1441 E3,1441 PHSBB2 ERASE B(1)PRM
 0717 E3,1442 E3,1442 PHSNAME3 ERASE B(1)PRM
 0718 E3,1443 E3,1443 PHSBB3 ERASE E(1)PRM
 0719 E3,1444 E3,1444 PHSNAME4 ERASE B(1)PRM
 0720 E3,1445 E3,1445 PHSBB4 ERASE B(1)PRM
 0721 E3,1446 E3,1446 PHSNAME5 ERASE B(1)PRM
 0722 E3,1447 E3,1447 PHSBB5 ERASE B(1)PRM
 0723 E3,1450 E3,1450 PHSNAME6 ERASE B(1)PRM
 0724 E3,1451 E3,1451 PHSBB6 ERASE B(1)PRM

R0725 IMU COMPENSATION PARAMETERS. (22D)

0727 E3,1452 E3,1452 PBIASX ERASE B(1) PIPA BIAS, PIPA SCALE FACTR TERMS
 0728 REF 1 E3,1452 PIPAEIAS = PBIASX INTERMIXED.
 0729 E3,1453 E3,1453 PIPASCFX ERASE
 0730 REF 1 E3,1453 PIPASCF = PIPASCFx
 0731 E3,1454 E3,1454 PEIASY ERASE
 0732 E3,1455 E3,1455 PIPASCFY ERASE
 0733 E3,1456 E3,1456 PBIASZ ERASE
 0734 E3,1457 E3,1457 PIPASCFZ ERASE
 0735 E3,1460 E3,1460 NPDY ERASE GYPC BIAS DRIFTS
 0736 E3,1461 E3,1461 NEDY ERASE
 0737 E3,1462 E3,1462 NEDZ ERASE

ERASABLE ASSIGNMENTS

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0738	F3,1463	F3,1463	ACIAX	ERASE	ACCELERATION SENSITIVE DRIFT ALONG THE INPUT AXIS
0739	F3,1464	F3,1464	ACIAY	ERASE	
0740	F3,1465	F3,1465	ACIAZ	ERASE	

0741	E3,1466	E3,1466	ADSRAX	ERASE	ACCELERATION SENSITIVE DRIFT ALONG THE SPIN REFERENCE AXIS
0742	E3,1467	E3,1467	ADSRAY	ERASE	
0743	E3,1470	E3,1470	ADSRAX	ERASE	

0744	E3,1471	E3,1476	GCCMP	FRASE	+5	CONTAINS COMPENSATING TORQUES
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0745 REF 1 E3,1471 COMMAND EQUALS GDCMP
0746 REF 2 LAST 111 E3,1474 CCUINE EQUALS GDCMP +3
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0747	E3,1477	E3,1477	GCCMPSW	ERASE
A0748				

R0749 STATE VECTORS FOR ORBIT INTEGRATION. (44C)

R0751	(DIFECGNT THRU XKEP MUST BE IN SAME
R0752	EBANK AS RRECTCSM, RRECTLEM ETC.
R0753	BECAUSE THE COPY-CYCLES (ATCPGSM,
R0754	PTOACSM ETC) ARE EXECUTED IN BASIC.
R0755	ALL OTHER REFERENCES TO THIS GROUP
R0756	ARE BY INTERPRETIVE INSTRUCTIONS.)

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0757          E3,1500  E3,1553  DIFGCNT ERASE  +43D          B(1)
R0758          (LPSVFLAG...XKEP MUST BE KEPT IN ORDER)

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0759	REF	1	E3, 1501	UPSVFLAG	EQUALS	DIFEGCNT	+1	P(1)
0760	REF	1	E3, 1502	PRFCT	EQUALS	UPSVFLAG	+1	P(6)
0761	REF	1	E3, 1510	VRECT	EQUALS	VRECT	+6	B(6)
0762	REF	1	E3, 1516	TFT	EQUALS	VRECT	+6	B(2)
0763	REF	1	E3, 1520	TCELTAV	EQUALS	TET	+2	P(6)
0764	REF	1	E3, 1526	TMOV	EQUALS	TCELTAV	+6	B(6)
0765	REF	1	E3, 1534	RCV	EQUALS	TALV	+6	B(6)
0766	REF	1	E3, 1542	VCV	EQUALS	RCV	+6	B(6)
0767	REF	1	E3, 1550	TC	EQUALS	VCV	+6	B(2)
0768	REF	1	E3, 1552	XKEP	EQUALS	TC	+2	B(2)

P 0769 PERMANENT STATE VECTORS AND TIMES. (99C)

R)771 (DC NOT OVERLAY WITH ANYTHING AFTER BOOST)

R0772 (RRFCICSM...XKFCICSM MUST BE KEPT IN THIS CASE)

0773			F3,1554	F3,1561	RRECTCSM ERASE	+5		B(6)PRM CSM VARIABLELS.
0774	REF	1	F3,1554		RRECTCTH =	RRECTCSM		
0775			F3,1562	F3,1567	VRECTCSM ERASE	+5		B(6)PRM

L ERASABLE ASSIGNMENTS

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0776			F3,1570	E3,1571	TETCSM	ERASE	+1	B(2)PRM
0777	REF	1	F3,1570		TETOTHER	=	TETCSM	
0778			F3,1572	F3,1577	DELTA CS	ERASE	+5	B(6)PRM
0779			F3,1600	F3,1605	NUVCSM	ERASE	+5	B(6)PRM
0780			F3,1616	F3,1613	RCVCSM	ERASE	+5	B(6)PRM
0781			F3,1614	F3,1621	VCVCSM	ERASE	+5	B(6)PRM
0782			F3,1622	F3,1623	TCOSM	ERASE	+1	B(2)PRM
0783			F3,1624	F3,1625	XKFCOSM	ERASE	+1	B(2)PRM

R0784 (RRECTLEM ...XKFCLEM MUST BE KEPT IN THIS ORDER)

0785			F3,1626	F3,1633	RRECTLEM	ERASE	+5	B(6)PRM LEM VARIABLES
0786	REF	1	F3,1626		RRECTHIS	=	RRECTLEM	
0787			F3,1634	F3,1641	VRECTLEM	ERASE	+5	B(6)PRM
0788			F3,1642	F3,1643	TETLEM	ERASE	+1	B(2)PRM
0789	REF	1	F3,1642		TETTHIS	=	TETLEM	
0790			F3,1644	F3,1651	DELTALEM	ERASE	+5	B(6)PRM
0791			F3,1652	F3,1657	NUVLEM	ERASE	+5	B(6)PRM
0792			F3,1660	F3,1665	RCVLEM	ERASE	+5	B(6)PRM
0793			F3,1666	F3,1673	VCVLEM	ERASE	+5	B(6)PRM
0794			F3,1674	F3,1675	TCLEM	ERASE	+1	B(2)PRM
0795			F3,1676	F3,1677	XKFCLEM	ERASE	+1	B(2)PRM
0796			F3,1700	F3,1705	X789	ERASE	+5	
0797			F3,1706	F3,1710	TEPFEM	ERASE	+2	
0798			F3,1711	F3,1712	AZC	ERASE	+1	
0799			F3,1713	F3,1714	-AYD	ERASE	+1	
0800			F3,1715	F3,1716	AXD	ERASE	+1	

A0811

R0812 STATE VECTORS FOR DOWNLINK.

(120)

0804			F3,1717	F3,1724	R-OTHER	ERASE	+5	B(6)PRM POS VECT (OTHER VECH) FOR DNLINK
0805			F3,1725	F3,1732	V-OTHER	ERASE	+5	B(6)PRM VEL VECT (OTHER VECH) FOR DNLINK
0806	REF	2	LAST	112	F3,1570	T-OTHER	=	TETCSM
								TIME (OTHER VECH) FOR DNLINK

R0817 REFSMMAT.

(180)

0809			F3,1733	F3,1754	REFSMMAT	ERASE	+17D	I(180)PRM
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R0810 ACTIVE VEHICLE CENTANG. MUST BE DISPLAYED ANYTIME (ALMOST.) (20)

0812			F3,1755	F3,1756	ACTCENT	ERASE	+1	I(2) S-S CENTRAL ANGLE BETWEEN ACTIVE
A0813								VEHICLE AT TPI TIG AND TARGET VECTOR.

R0814 **** USED IN CONICSEX (PLAN INERT ORIENT) ****

L ERASABLE ASSIGNMENTS

LSFR'S PAGE NO. 24 EO S4

0815 A0816	REF 1	E3,1716	TIMSUBC	EQUALS	TEPHEN	CSEC R-42 (TRIPLE PRECISION)
R0817		LPS20.1 STORAGE	-ALL ARE PRM -			(90)
0819		E3,1757	E3,1757	LS21X	ERASE	I(1)
0820		E3,1760	E3,1765	LCSVFL	ERASE +5	I(6)
0821 A0822		E3,1766	E3,1767	MLCSV	ERASE +1	I(2) MAGNITUDE OF LCS, METERS E-29
R0823	**** P22 ****	(COVERLAYS LPS 20.1 STORAGE)				(60)
0825 A0826	REF 1	E3,1760	VSUBC	EQUALS	LOSVEL	I(6)S-S CSM VELOCITY VECTOR
R0827		PACLOCATED ERASABLES FOR P20/P22				(60)
0829		E3,1770	E3,1771	RANGEVAR	ERASE +1	I(2) RR RANGE ERROR VARIANCE
0830		E3,1772	E3,1773	RATEVAR	ERASE +1	I(2) RR RANGE-RATE ERROR VARIANCE
0831		E3,1774	E3,1774	RVARMIN	ERASE	I(1) MINIMUM RANGE ERROR VARIANCE
0832 A0833		E3,1775	E3,1775	VVARMIN	ERASE	I(1) MINIMUM RANGE-RATE ERROR VARIANCE
R0834		P32-P33 STORAGE				(20)
0836 A0837		E3,1776	E3,1777	TCDH	ERASE +1	I(2) T2 CDF TIME IN CS. (ALSO DOWNLINKED)
0838		E3,1777	END-E3	EQUALS	1777	** LAST LOCATION USED IN E3 **

L ERASABLE ASSIGNMENTS

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PC839 FEAK-4 ASSIGNMENTS

0841 E4,1400 SETLCC 2000

R0841 E4 IS, FOR THE MOST PART RESERVED FOR PAD LOADED AND UNSHARABLE ERASE.

0842 E4,1400 MEMORY EQUALS

R0843 P21 STORAGE. -PAD LOADED- (6C)

0845	E4,1400	E4,1411	WRENTPCS	ERASE	B(1)PL	KM*2(-7)
0846	E4,1411	E4,1401	WRENCEVL	ERASE	B(1)PL	KM(-1/2)*2(11)
0847	E4,1412	E4,1402	WSHAFT	ERASE	B(1)PL	KM*2(-7)
0848	E4,1403	E4,1403	WTRUN	ERASE	B(1)PL	KM*2(-7)
0849	E4,1404	E4,1404	RMAX	ERASE	B(1)PL	METERS*2(-19)
0850	E4,1405	E4,1405	VMAX	ERASE	B(1)PL	M/CSEC*2(-7)

R0851 LUNAR SURFACE NAVIGATION (2C)

0853	E4,1406	E4,1406	WSUREPOS	ERASE	B(1)PL
0854	E4,1407	E4,1407	WSURFVFL	ERASE	B(1)PL

A0855

P0856 P22 STORAGE. -PAD LOADED- (2C)

0858	E4,1410	E4,1410	SHAFTVAR	ERASE	B(1)PL	PAD SQ*2(12)
0859	E4,1411	E4,1411	TRUNVAR	ERASE	B(1)PL	PAD SQ*2(10)

R0860 CCNISEX STORAGE. -PAD LOADED- (6C)

0862	E4,1412	E4,1417	SC4LM	ERASE	+5	I(6)MCCN LIBRATION VECTOR
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A0863

R0864 V47(P47) AGS INITIALIZATION STORAGE. -PAD LOADED- (2C)

0866	E4,1420	E4,1421	AGSK	ERASE	+1
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R0867 LUNAR LANDING STORAGE. -PAD LOADED- (6C)

0869	E4,1422	E4,1427	RLS	ERASE	+5	I(6) LANDING SITE VECTOR -MCCN REF
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A0870

P0871 INTEGRATION STORAGE. (102C)

0873	E4,1430	E4,1575	PBODY	ERASE	+1(1D)	I(1)
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L ERASABLE ASSIGNMENTS

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EO S4

0874	REF	1		E4,1431	ALPHAV	EQUALS	PBCDY	+1	I(6)	
0875	REF	1		E4,1437	BETAV	EQUALS	ALPHAV	+6	I(6)	
0876	REF	1		E4,1445	PHIV	EQUALS	BETAV	+6	I(6)	
0877	REF	1		E4,1452	PSIV	EQUALS	PHIV	+6	I(6)	
0878	REF	1		E4,1461	FV	EQUALS	PSIV	+6	I(6)	PERTURBING ACCELERATIONS
0879	REF	1		E4,1467	ALPHAM	EQUALS	FV	+6	I(2)	
0880	REF	1		E4,1471	BETAM	EQUALS	ALPHAM	+2	I(2)	
0881	REF	1		E4,1473	TAU.	EQUALS	BETAM	+2	I(2)	
0882	REF	1		E4,1475	DT/2	EQUALS	TAU.	+2	I(2)	
0883	REF	1		E4,1477	H	EQUALS	DT/2	+2	I(2)	
0884	REF	1		E4,1501	GMCDE	EQUALS	H	+2	I(1)	
0885	REF	1		E4,1502	IRETURN	EQUALS	GMCDE	+1	I(1)	
0886	REF	1		E4,1503	NORMGAM	EQUALS	IRETURN	+1	I(1)	
0887	REF	1		E4,1504	RQCV	EQUALS	NORMGAM	+1		
0888	REF	1		E4,1512	ORIGEX	EQUALS	RQCV	+6	I(1)	
0889	REF	1		E4,1512	KEPRTN	EQUALS	ORIGEX		I(1)	
0890	REF	2	LAST 115	E4,1513	RQVV	EQUALS	ORIGEX	+1	I(6)	
0891	REF	1		E4,1521	RPSV	EQUALS	RQVV	+6	I(6)	
0892	REF	1		E4,1527	XKEPNEW	EQUALS	RPSV	+6	I(2)	
0893	REF	1		E4,1531	VECTAB	EQUALS	XKEPNEW	+2	I(36D)	
0894	REF	1		E4,1574	VECTABEND	EQUALS	VECTAB	+25D	FND MARK	

A0895

R0896 THESE PROBABLY CAN SHARE MID-COURSE VARIABLES. (6D)

0898	REF	2	LAST 115	E4,1537	VACX	EQUALS	VECTAB	+6	I(2)
0899	REF	1		E4,1541	VACY	EQUALS	VACX	+2	I(2)
0900	REF	1		E4,1543	VACZ	EQUALS	VACY	+2	I(2)

R0901 SERVICES STORAGE (USED BY ALL POWERED FLIGHT PRGCS.) (18D)

0903	REF	3	LAST 115	E4,1545	XNRPIP	EQUALS	VECTAB	+12D	I(6)
0904	REF	1		E4,1553	YNEPIP	EQUALS	XNRPIP	+6	I(6)
0905	REF	1		E4,1561	ZNRPIP	EQUALS	YNEPIP	+6	I(6)

A0906

R0907 SOME VFRB 82 STORAGE (4D)

0909	REF	2	LAST 115	E4,1517	HAPDX	EQUALS	FGVV	+4	I(2)
0910	REF	1		E4,1521	HPERX	EQUALS	HAPDX	+2	I(2)

A0911

R0912 V82 STORAGE (6D)

0914	REF	4	LAST 115	E4,1567	VCNE	EQUALS	VECTAB	+30D	I(6)TMP	NORMAL VELOCITY VCNE /SQRT. MU
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A0915

R0916 R31(V83) STORAGE. -SHARES WITH INTEGRATION STORAGE- (28D)

L EPASABLE ASSIGNMENTS

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0918 REF 2 LAST 115 E4,1504 BASEFV EQUALS RQCV I(6) BASE VEL VECTOR THIS VEH
A0919

0920 REF 3 LAST 115 E4,1513 EASETIME EQUALS RQVV I(2) TIME ASSOC WITH BASE VECs

0921 REF 4 LAST 116 E4,1515 ORIG EQUALS RQVV +2 I(1) =0 FOR EARTH =2 FOR MCCN

0922 REF 5 LAST 116 E4,1516 STATEXIT EQUALS RQVV +3 I(1) STC ADDRESS FOR STATEXTP

0923 REF 6 LAST 116 E4,1517 BASECTV EQUALS RQVV +4 I(6) BASE VEL VECTOR OTHER VEH

A0924

0925 REF 5 LAST 115 E4,1537 BASEOTV EQUALS VECTAB +6 I(6) BASE PCS VECTOR OTHER VEH

A0926

0927 REF 6 LAST 116 E4,1567 BASETHP EQUALS VECTAB +30D I(6) BASE PCS VECTOR THIS VEH

A0928

R0929 KEPLER STORAGE. (KEPLER IS CALLED BY PRECISION INTEGRATION AND (20)
R0931 CCNTCS)

0932 E4,1576 E4,1577 EPSTLCNT ERASE +1 I(2)

A0933

R0934 VERB 83 STORAGE. (18D)

0936 E4,1600 E4,1621 RANGE ERASE +17D I(2)DSP NCUN 54 DISTANCE TO OPTICAL SUBJ

0937 REF 1 E4,1612 RRATE EQUALS RANGE +2 I(2)DSP NCUN 54 RATE OF APPROACH.

0938 REF 1 E4,1604 RTHETA EQUALS RRATE +2 I(2)DSP NCUN 54.

0939 REF 1 E4,1616 RCNF EQUALS RTHETA +2 I(6)TMP VECTOR STORAGE. (SCRATCH)

0940 REF 1 E4,1614 VONE EQUALS RCNF +6 I(6)TMP VECTOR STORAGE. (SCRATCH)

R0941 VERB 67 STORAGE

0942 REF 2 LAST 116 E4,1610 WWPOS = RANGE NCUN 99 (V67)

0943 REF 2 LAST 116 E4,1612 WWVEL = RRATE NCUN 99 (V67)

0944 REF 2 LAST 116 E4,1614 WWBIAS = RTHETA NCUN 99 (V67)

R0945 V82 STORAGE. (CANNOT OVERLAY RONE OR VONE) (11D) TWO SEPARATE LOCATIONS

0947 REF 7 LAST 116 E4,1537 V82FLAGS EQUALS VECTAB +6 (1) FOR V82 BITS.

0948 REF 1 E4,1540 TFF EQUALS V82FLAGS +1 I(2)

0949 REF 1 E4,1542 -TPER EQUALS TFF +2 I(2)

A0950

0951 REF 3 LAST 116 E4,1600 HPERMIN EQUALS RANGE I(2) SET TO 300KFT OR 35KFT FOR SR30.1

0952 REF 1 E4,1612 RPACTEM EQUALS HPERMIN +2 I(2) PAD OF LANDING RADII FOR SR30.1

0953 REF 1 E4,1614 TSTART82 EQUALS RPACTEM +2 I(2) TEMP TIME STORAGE FOR V82.

A0954

R0955 VARIOUS DISPLAY REGISTERS

(6D) NCUN 84; P76

L ERASABLE ASSIGNMENTS

USER'S PAGE NO. 28

EO S4

0957 F4,1622 E4,1627 DEIVDV ERASE +50 (6)
A0958

R0959 ALIGNMENT PLANETARY-INERTIAL TRANSFORMATION STORAGE. (180)

R0961 UNSHARED WHILE IN CN LUNAR SURFACE.

0962 F4,1630 E4,1651 GSAV ERASE +170 1(6)
0963 REF 1 F4,1636 YNBSAV EQUALS GSAV +6 1(6)
0964 REF 1 F4,1644 ZNBSAV EQUALS YNBSAV +6 1(6)
A0965

R0966 KALCMANU STORAGE. CAN OVERLAY GSAV. (1ED)

0968 REF 2 LAST 117 F4,1630 MFS EQUALS GSAV 1(18)
0969 REF 1 F4,1630 MFI EQUALS MFS 1
0970 REF 2 LAST 117 F4,1630 KFL EQUALS MFS 1(18)
0971 REF 2 LAST 117 F4,1630 E01 EQUALS MFS 1(6)
0972 REF 1 F4,1636 E02 EQUALS E01 +6 1(6)

R0973 LR VEL BEAM VECTORS. (260)

A0975
P1976 CAN OVERLAY GSAV WITH CARE, USED DURING POWERED DESCENT ONLY.

0977 REF 3 LAST 117 F4,1630 VZBEAMNB EQUALS GSAV 1(6) LR VELOCITY BEAMS IN NB COORDS.
0978 REF 1 F4,1636 VYBEAMNB EQUALS VZBEAMNB +6 1(6)
0979 REF 1 F4,1644 VXBEAMNB EQUALS VYBEAMNB +6 1(6) PRESERVE Z,Y,X ORDER.

0980 REF 1 F4,1652 LRVTIME = VXBEAMNB +6 E(2) LR
0981 REF 1 F4,1654 LPXCDU = LRVTIME +2 B(1) LR
0982 REF 1 F4,1655 LRYCCU = LRVTIME +1 B(1) LR
0983 REF 1 F4,1656 LPZCDU = LRYCDU +1 B(1) LR
0984 REF 1 F4,1657 PIPTFM = LRZCDU +1 B(2) LR
A0985

R0986 P32-P35, F72-P75 STORAGE. (400)

0988 F4,1652 F4,1653 T1TOT2 ERASE +1 (2) TIME FROM CSI TO CDH
0989 F4,1654 F4,1655 T2TOT2 ERASE +1 (2)
0990 F4,1656 F4,1657 ELEV ERASE +1 (2)
0991 F4,1660 E4,1665 UPL ERASE +5 (6)
0992 F4,1666 E4,1673 DELVEET1 ERASE +5 1(6) DV CSI IN REF
0993 F4,1674 E4,1701 DELVEET2 ERASE +5 1(6) DV CSH IN REF
0994 F4,1702 F4,1707 RACT1 ERASE +5 (6) PCS VEC OF ACTIVE AT CSI TIME
0995 F4,1710 E4,1715 RACT2 ERASE +5 (6) PCS VEC OF ACTIVE AT CDH TIME

L ERASABLE ASSIGNMENTS

USER'S PAGE NO. 29 EO S4

0996		E4,1716	F4,1717	RTSR1/ML	ERASE	+1	(2)	SG ROOT 1/MU STORAGE
0997		E4,1720	F4,1721	RTMU	ERASE	+1	(2)	ML STORAGE
0998								

R0999 (THE FOLLOWING ERASABLES OVERLAY PORTIONS OF THE PREVIOUS SECTION)

1001	REF	1		E4,1652	+MGA	EQUALS TITOT2	(2)	S-S + MID GIM ANGL TC DELVEET3
A1002								

1003	REF	1		E4,1660	UNRM	EQUALS UP1	(6)	S-S
A1004								

1005	REF	1		E4,1702	DVLOS	EQUALS RACT1	(6)	S-S DELTA VELOCITY, LCS COORD-DISPLA
1006	REF	1		E4,1711	ULCS	EQUALS RACT2	(6)	S-S UNIT LINE OF SIGHT VECTOR
A1007								

1008	REF	1		E4,1716	NOMTPI	EQUALS RTSR1/ML	(2)	S-S NOMINAL TPI TIME FOR RECYCLE
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R1009 SOME P30 STORAGE. (40)

1011	REF	2	LAST	118	E4,1716	HAPP	EQUALS RTSR1/ML	(2)
1012	REF	1			E4,1720	HPER	EQUALS HAPD	+2 (2)
A1013								

R1014 THE FOLLOWING ARE ERASABLE LOADS DURING A PERFORMANCE TEST.

1015	REF	1			E4,1400	TRANSM1	=	WRFNDPOS	E4,1400
1016	REF	1			E4,1422	ALFCK	=	TRANSM1 +180	

R1017 ***** THE FOLLOWING SECTIONS OVERLAY V83 AND DISPLAY STORAGE *****

R1018 V47(R47)AGS INITIALIZATION PROGRAM STORAGE. (OVERLAYS V83) (140)

1020	REF	4	LAST	116	E4,1617	AGSBUFF	EQUALS RANGE	B(140)
1021	REF	1			E4,1615	AGSBUFFE	EQUALS AGSBUFF	+120 ENDMARK

R1022 P36 OUT-OF-PLANE RENDEZVOUS DISPLAY STORAGE. (OVERLAYS V83) (120)

1024	REF	2	LAST	116	E4,1616	RPASS36	EQUALS RCNE	(6) S-S
1025	REF	1			E4,1614	UNP36	EQUALS RPASS36	+6 (6) S-S

R1026								S-PANE ANTENNA CIMPAL ANGLES. DISPLAYED BY RC5(V64). (OVERLAYS V83) (100)
R1028								(OPERATES DURING F00 ONLY)

L ERASABLE ASSIGNMENTS

USFR'S PAGE NO. 20 EQ S4

1029	REF	5	LAST	118	E4,1600	ALPHASB	EQUALS	RANGE		B(2)	DSP	NCUN	51.	PITCH	ANGLE.
1030	REF	1			E4,1602	BETASB	EQUALS	ALPHASB	+2	B(2)	DSP	NCUN	51.	YAW	ANGLE.
1031	REF	1			E4,1604	RLM	EQUALS	BETASB	+2	I(6)	S	S/C	POSITION	VECTOR.	

R1032 **** USED IN S-EAND ANTENNA FOR LM ****

1033	REF	2	LAST	119	E4,1602	YAWANG	EQUALS	BETASB							
1034	REF	2	LAST	119	E4,1600	PITCHANG	EQUALS	ALPHASB							

R1035 NCUN 56 DATA - COMPUTED AND DISPLAYED BY VERB 85.

(4)

1037	REF	1			E4,1600	RR-AZ	EQUALS	PITCHANG		I(2)	ANGLE	BETWEEN	LOS	AND	X-Z	PLANE.
1038	REF	1			E4,1602	RR-ELEV	EQUALS	RR-AZ	+2	I(2)	ANGLE	BETWEEN	LOS	AND	Y-Z	PLANE.

R1039 R04(V62) RADAR TEST STORAGE.
R1041 R04 IS RESTRICTED TO P00.

(8C)

1042	REF	6	LAST	119	E4,1600	PSTACK	EQUALS	RANGE		B(8)	BLUFER	FOR	R04	NCUNS.
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R1044 INITVEL STORAGE. ALSO USED BY P31,P34,P35,P74,P75,P10,P11,MIDGIM,S40.1 AND S40.9. (18C)

R1046 (POSSIBLY PINIT & VINIT CAN OVERLAY DELVEET1 & 2 ABOVE)

1047					E4,1722	E4,1727	RINIT	ERASE	+5	I(6)	ACTIVE	VEHICLE	POSITION
1048					E4,1730	E4,1735	VINIT	ERASE	+5	I(6)	ACTIVE	VEHICLE	VELOCITY
1049					E4,1736	E4,1743	VIPIRME	ERASE	+5	I(6)	NEW	VEL	REQUIRED

R1050 VARIOUS DISPLAY REGISTERS. BALLANGS

(3C)

1052					E4,1744	E4,1744	FDAIX	ERASE		I(1)
1053					E4,1745	E4,1745	FDAIY	ERASE		I(1)
1054					E4,1746	E4,1746	FDAIZ	ERASE		I(1)

R1056 P34-P35 STORAGE. DOWNLINKED.

(2C)

1058					E4,1747	E4,1750	DELVTPE	ERASE	+1	I(2)	DELTA	V	FOR	TPF
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R1060 LPS20.1 STORAGE. CALLED BY R65.

(12C)

1062					E4,1751	E4,1756	LMPOS	ERASE	+5	I(6)	TEMP.	STORAGE	FOR	LM	POS.	VECTOR.
1063					E4,1757	E4,1764	LMVEL	ERASE	+5	I(6)	TEMP.	STORAGE	FOR	LM	VEL.	VECTOR.

R1065 INITVEL STORAGE. ALSO USED BY P31,34,35,74,75,S40.1 AND DOWNLINKED. (6C)

1067					E4,1765	E4,1772	DELVEET3	ERASE	+5	I(6)	DELTA	V	IN	INERTIAL	COORDINATES.
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L ERASABLE ASSIGNMENTS

USER'S PAGE NO. 31 EC 54

P1069 SOME P04 (V67)-R77 STORAGE.

(60)

1071				E4,1773	E4,1773	RTSTDEX	ERASE		B(1)
1072				E4,1774	E4,1774	RTSTMAX	ERASE		B(1)
1073				E4,1775	E4,1775	RTSTBASE	ERASE		B(1)
1074				E4,1776	E4,1776	RTSTLOC	ERASE		B(1)
1075				E4,1777	E4,1777	PSAMPCT	ERASE		B(1)
1076	REF	2	LAST	115	E4,1575	RFAILCNT	EQUALS	PBODY	+1010 B(1)

1078				E5,1470		END-F4	EQUALS		FIRST UNSEC LOCATION IN E4
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R1079 SECOND OPS OUTRANCE (LUNAR LANDING) (OVERLAY P32-35,INITVEL) (140)

1081	REF	1		E4,1662		VHCRIZ	EQUALS	PIPTEN	+3 I(2) DISPLAY
1082	REF	1		E4,1664		ANGTERM	EQUALS	VHCRIZ	+2 I(6) GUIDANCE
1083	REF	1		E4,1672		FEEMAB	EQUALS	ANGTERM	+6 I(6) LANDING RADAR

P1085 R12 DOWNLINK QUANTITIES

(50)

1087	REF	1		E4,1734		LRXCCEL	EQUALS	/LAND/	+2 B(1) LANDING RADAR DOWNLINK
1088	REF	1		E4,1735		LRXCDEL	EQUALS	LRXCDEL	+1 B(1) LANDING RADAR DOWNLINK
1089	REF	1		E4,1736		LRZCCEL	EQUALS	LRXCDEL	+1 B(1) LANDING RADAR DOWNLINK
1090	REF	1		E4,1737		LRVTINCL	EQUALS	LRZCDEL	+1 B(2) LANDING RADAR DOWNLINK

A1091

R1092 ASCENT GUIDANCE FOR LUNAR LANDING

(540)

1094	REF	2	LAST	120	E4,1662	AT	EQUALS	PIPTEN	+3 I(2)TMP ENGINE DATA -- THRUST ACC*2(9)
1095	REF	1			E4,1664	VF	EQUALS	AT	+2 I(2)TMP EXHAUST VELOCITY * 2(7)M/CS.
1096	REF	1			E4,1666	ITC	EQUALS	VF	+2 I(2)TMP TAILOFF TIME * 2(17)CS.
1097	REF	1			E4,1670	TBUP	EQUALS	ITC	+2 I(2)TMP (M/MCCT) * 2(17)CS.
1098	REF	1			E4,1672	RDCT	EQUALS	TBUP	+2 I(2)TMP TARGET VELOCITY COMPONENTS
1099	REF	1			E4,1674	YDCTD	EQUALS	RDCTD	+2 I(2)TMP SCALING IS 2(7)M/CS.
1100	REF	1			E4,1676	ZDCTC	EQUALS	YDCTD	+2 I(2)TMP
1101	REF	1			E4,1710	/R/MAG	EQUALS	ZDCTC	+2 I(2)TMP
1102	REF	1			E4,1712	LAXIS	EQUALS	/R/MAG	+2 I(6)TMP
1103	REF	1			E7,1725	ZAXIS1	=	UH2P	
1104	REF	1			E7,1727	RDCT	=	HDCTDISF	
1105	REF	1			E4,1710	YDCT	=	LAXIS	+6 I(2)TMP VEL. NORMAL TO REF. PLANE*2(-7)
1106	REF	1			E4,1712	ZDCT	EQUALS	YDCT	+2 I(2)TMP DOWN RANGE VEL *2(-7).
1107	REF	1			E4,1714	GEFF	EQUALS	ZDCT	+2 I(2)TMP EFFECTIVE GRAVITY

R1108 THESE TWO GROUPS OF ASCENT GUIDANCE ARE SPLIT BY THE ASCENT-DESCENT SERVICE SECTION FOLLOWING THIS SECTION

1110	REF	2	LAST	120	E4,1734	Y	EQUALS	/LAND/	+2 I(2)TMP CUT-OF-PLANE DIST *2(24)M
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L ERASABLE ASSIGNMENTS

LSEF'S PAGE NO. 32

EQ S4

1111	REF	1	E4,1736	DRDOT	EQUALS Y	+2	I(2)TMP	RDCTD - RDCT
1112	REF	1	E4,1740	DYDOT	EQUALS DPCDOT	+2	I(2)TMP	YDCTD - YDOT
1113	REF	1	E4,1742	DZDOT	EQUALS DYDOT	+2	I(2)TMP	ZDCTD - ZDOT
1114	REF	1	E4,1744	PCONS	EQUALS DZDOT	+2	I(2)TMP	CONSTANT IN ATR EQUATION
1115	REF	1	E4,1746	YCONS	EQUALS PCONS	+2	I(2)TMP	CONSTANT IN ATY EQUATION
1116	REF	1	E4,1750	PRATE	EQUALS YCONS	+2	I(2)TMP	RATE COEFF. IN ATR EQUATION
1117	REF	1	E4,1752	YRATE	EQUALS PRATE	+2	I(2)TMP	RATE COEFF. IN ATY EQUATION
1118	REF	1	E4,1754	ATY	EQUALS YRATE	+2	I(2)TMP	CUT-OF-PLANE THRUST COMP.*2(9)
1119	REF	1	E4,1756	ATP	EQUALS ATY	+2	I(2)TMP	RADIAL THRUST COMP.*2(9)
1120	REF	1	E4,1760	ATP	EQUALS ATP	+2	I(2)TMP	DOWN-RANGE THRUST COMP
1121	REF	1	E4,1762	YAW	EQUALS ATP	+2	I(2)TMP	
1122	REF	1	E4,1764	PITCH	EQUALS YAW	+2	I(2)TMP	

A1123

R1124 SERVICER FOR LUNAR ASCENT AND DESCENT

(14D)

1126	REF	1	E4,1716	G(CSM)	EQUALS GFEF	+2	I(6)	FOR UPDATE OF COMMAND MODULE STATE
1127	REF	1	E3,1717	R(CSM)	EQUALS R-CTHER			VECTORS BY LEN; ANALOGS OF GET/2,
1128	REF	1	E3,1725	V(CSM)	EQUALS V-CTHER			R, AND V, RESPECTIVELY OF THE CSM
1129	REF	1	E4,1724	WM	EQUALS G(CSM)	+6	I(6)	TMP - LUNAR ROTATION VECTOR (SM)
1130	REF	1	E4,1732	/LAND/	EQUALS WM	+6	B(2)	LUNAR RADIUS AT LANDING SITE

A1131

L ERASABLE ASSIGNMENTS

USER'S PAGE NO. 33 EO S4

P1132 FRANK-5 ASSIGNMENTS

1133 F5,1410 SETLCC 2400

R1134 W-MATRIX. ESSENTIALLY UNSHARABLE. (162D)

1136			F5,1400	F5,1641	W	EPASE	+161C
1137	REF	1	F5,1642		ENDW	EGLALS W	+162C

A113P

R1129 ***** OVERLAY NUMBER 1 IN FRANK 5 *****

R114) * W-MATRIX PADIADCS (124D)

R1142 PLEASE RETAIN THE ORDER OF TLAND THRU JAPFG

1143	REF	2	LAST 122	F5,1400	TLAND	EQUALS W	1(2)	NOMINAL TIME OF LANDING
1144	REF	1		F5,1402	PEPFG	EQUALS TLAND	+2	I(6) BRAKING
1145	REF	1		F5,1410	VERFG	EQUALS RERFG	+6	I(6) PHASE
1146	REF	1		F5,1416	ABRFG	EQUALS VERFG	+6	I(6) TARGET
1147	REF	1		F5,1424	VERFG*	EQUALS ABRFG	+6	I(2) PARAMETERS:
1148	REF	1		F5,1426	ABRFG*	EQUALS VERFG*	+2	I(2) FIGH
1149	REF	1		F5,1430	JBRFG*	EQUALS ABRFG*	+2	I(2) GATE
1150	REF	1		F5,1432	GAINBRAK	EQUALS JBRFG*	+2	E(2)
1151	REF	1		F5,1434	TCCFBRAK	EQUALS GAINBRAK	+2	E(1)
1152	REF	1		F5,1435	TCCIBRAK	EQUALS TCCFBRAK	+1	E(1)
1153	REF	1		F5,1436	RAPFG	EQUALS TCCIBRAK	+1	I(6) APPROACH
1154	REF	1		F5,1444	VAPFG	EQUALS RAPFG	+6	I(6) PHASE
1155	REF	1		F5,1452	AAPFG	EQUALS VAPFG	+6	I(6) TARGET
1156	REF	1		F5,1460	VAPFG*	EQUALS AAPFG	+6	I(2) PARAMETERS:
1157	REF	1		F5,1462	AAPFG*	EQUALS VAPFG*	+2	I(2) ICH
1158	REF	1		F5,1464	JAPFG*	EQUALS AAPFG*	+2	I(2) GATE
1159	REF	1		F5,1466	GAINAPFG	EQUALS JAPFG*	+2	E(2)
1160	REF	1		F5,1470	TCCFAPPR	EQUALS GAINAPPR	+2	E(1)
1161	REF	1		F5,1471	TCCIAPPP	EQUALS TCCFAPPR	+1	E(1)
1162	REF	1		F5,1472	VIGN	EQUALS TCCIAPPP	+1	I(2) DESIRED SPEED FOR IGNITION
1163	REF	1		F5,1474	RIGNX	EQUALS VIGN	+2	I(2) DESIRED 'ALTITUDE' FOR IGNITION
1164	REF	1		F5,1476	RIGNZ	EQUALS RIGNX	+2	I(2) DESIRED GROUND RANGE FOR IGNITION
1165	REF	1		F5,1500	KIGNX/B4	EQUALS RIGNZ	+2	I(2)
1166	REF	1		F5,1502	KIGNY/B4	EQUALS KIGNX/B4	+2	I(2)
1167	REF	1		F5,1504	KIGNV/B4	EQUALS KIGNY/B4	+2	I(2)
1168	REF	1		F5,1506	LCWCRT	EQUALS KIGNV/B4	+2	E(1) (HIGHCRIT MUST FOLLOW LCWCRT)
1169	REF	1		F5,1507	HIGHCRIT	EQUALS LCWCRT	+1	E(1)
1170	REF	1		F5,1510	V2FG	EQUALS HIGHCRIT	+1	I(6) DESIRED VELOCITY FOR P65.
1171	REF	1		F5,1516	TALVERT	EQUALS V2FG	+6	I(2) TIME CONSTANT FOR P65 VEL. NULLING.
1172	REF	1		F5,1520	DELQFIX	EQUALS TALVERT	+2	I(2) LR ALTITUDE DATA REASONABLE PARAM.
1173	REF	1		F5,1522	LRALPHA	EQUALS DELQFIX	+2	E(1) PCS1 X PCTATION * MUST *

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1174	REF	1		F5,1523	LBETA1	EQUALS	LRALPHA	+1	B(1)	PCS1 Y ROTATION	* BE *
1175	REF	1		F5,1524	LRALPHA2	EQUALS	LRBETA1	+1	B(1)	PCS2 X ROTATION	* IN *
1176	REF	1		F5,1525	LRBETA2	EQUALS	LRALPHA2	+1	B(1)	PCS2 Y ROTATION	* ORDER *
1177	REF	1		F5,1526	LRVMAX	EQUALS	LRBETA2	+1	B(1)	LR VEL WEIGHTING FUNCTIONS	
1178	REF	1		F5,1527	LRVF	EQUALS	LRVMAX	+1	B(1)	LR VEL WEIGHTING FUNCTIONS	
1179	REF	1		F5,1530	LRVW7	EQUALS	LRVF	+1	B(1)	LR VEL WEIGHTING FUNCTIONS	
1180	REF	1		F5,1531	LRWVY	EQUALS	LRVW7	+1	B(1)	LR VEL WEIGHTING FUNCTIONS	
1181	REF	1		F5,1532	LRWVX	EQUALS	LRWVY	+1	B(1)	LR VEL WEIGHTING FUNCTIONS	
1182	REF	1		F5,1533	LRWVFZ	EQUALS	LRWVX	+1	B(1)	LR VEL WEIGHTING FUNCTIONS	
1183	REF	1		F5,1534	LRWVFY	EQUALS	LRWVFZ	+1	B(1)	LR VEL WEIGHTING FUNCTIONS	
1184	REF	1		F5,1535	LRWVFY	EQUALS	LRWVFY	+1	B(1)	LR VEL WEIGHTING FUNCTIONS	
1185	REF	1		F5,1536	LRWVFF	EQUALS	LRWVFY	+1	B(1)	LR VEL WEIGHTING FUNCTIONS	

1186	REF	5	LAST	SE	(120)	ABVEL*	EQUALS	BLF	B(1)	LR TEMP
1187	REF	6	LAST	123	(131)	VSELECT*	EQUALS	BLF +1	B(1)	LR TEMP

1188	REF	1		F5,1537	RCDSCALE	EQUALS	LRWVFF	+1	I(1)	CLICK SCALE FACTOR FOR ROC
1189	REF	1		F5,1540	TAUROD	EQUALS	RCDSCALE	+1	I(2)	TIME CONSTANT FOR R.C.C.
1190	REF	1		F5,1542	LAG/TAU	EQUALS	TAUROD	+2	I(2)	LAG TIME DIVIDED BY TAU (P66)
1191	REF	1		F5,1544	MINFORCE	EQUALS	LAG/TAU	+2	I(2)	MINIMUM FORCE P66 WILL COMMAND.
1192	REF	1		F5,1546	MAXFORCE	EQUALS	MINFORCE	+2	I(2)	MAXIMUM FORCE P66 WILL COMMAND.
1193	REF	1		F5,1550	J1PARM	EQUALS	MAXFORCE	+2	I(2)	PARAMETER SET # 1:
1194	REF	1		F5,1552	K1PARM	EQUALS	J1PARM	+2	I(2)	ABORT ORBIT SEMI-MAJOR AXIS COMP
1195	REF	1		F5,1554	J2PARM	EQUALS	K1PARM	+2	I(2)	PARAMETER SET # 2:
1196	REF	1		F5,1556	K2PARM	EQUALS	J2PARM	+2	I(2)	ABORT ORBIT SEMI-MAJOR AXIS COMP
1197	REF	1		F5,1560	THETCRIT	EQUALS	K2PARM	+2	I(2)	CENTRAL ANGLE SWITCHING CRITERION.
1198	REF	1		F5,1562	RAMIN	EQUALS	THETCRIT	+2	I(2)	MINIMUM ALLOWABLE APOCONE.
1199	REF	1		F5,1564	YLIM	EQUALS	RAMIN	+2	I(2)	MAXIMUM CROSS-RANGE DIST. IN ABORTS
1200	REF	1		F5,1566	ABTRDGT	EQUALS	YLIM	+2	I(2)	DESIRED RADIAL VEL. FOR ABORTS.
1201	REF	1		F5,1570	CCSTHET1	EQUALS	ABTRDGT	+2	I(2)	COS OF CONE 1 ANGLE FOR ABORTS.
1202	REF	1		F5,1572	CCSTHET2	EQUALS	CCSTHET1	+2	I(2)	COS OF CONE 2 ANGLE FOR ABORTS.

A1203

R1210 * SOME VARIABLES FOR SECOND PASS GUIDANCE

(28C)

1212	REF	1		F5,1574	CC	EQUALS	CCSTHET2	+2	I(18D)	GUIDANCE
1213	*REF	1		F5,1616	RANGEISP	EQUALS	CC	+18C	P(2)	DISPLAY
1214	*REF	1		F5,1616	CUTOFFPLN	EQUALS	RANGEISP		***	CUTOFFPLN CAN OVERLAY RANGESP ***
1215	REF	1		F5,1620	R6OVSAVE	EQUALS	CUTOFFPLN	+2	I(6)TMP	SAVES VALUE OF PCINTVSM THRU R51
1216	REF	1		F5,1626	RGL	EQUALS	R6OVSAVE	+6	I(6)	UNSHARED FOR DOWNLINK
12162	REF	1		F5,1634	DLAND	EQUALS	RGL	+6	I(6)	LANDING SITE CORRECTION SM FRAME
12164	REF	1		F5,1634	CLANEX	EQUALS	DLAND			
12166	REF	2	LAST	123	F5,1636	CLANEY	EQUALS	CLAND	+2	
12168	REF	3	LAST	123	F5,1640	CLANDZ	EQUALS	DLAND	+4	
1217	REF	2	LAST	123	F5,1620	VRIAS	EQUALS	R6OVSAVE		I(6) PIPARIAS EQUIV. VELOCITY VECTOR.
12172	REF	3	LAST	123	F5,1620	JPARM	EQUALS	R6OVSAVE		I(2) JPARM WILL EQUAL J1PARM OR J2PARM.
12174	REF	1		F5,1622	KPARM	EQUALS	JPARM	+2	I(2)	KPARM WILL EQUAL K1PARM OR K2PARM
12176	REF	1		F5,1624	RP	EQUALS	KPARM	+2	I(2)	PREDICTED BURNTOUT RADIALS-N*2(-24)
1218	REF	7	LAST	123	(137)	L*WCR*T	=	BLF		
1219	REF	8	LAST	123	(131)	H*GFCR*T	=	BLF +1		

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A1220

R1221 ALIGNMENT/SYSTEST/CALCSMSC COMMON STORAGE. (26D)

1223	REF	1			E5,1642	XSM	EQUALS	ENDW		E(6)
1224	REF	1			E5,1650	YSM	EQUALS	XSM	+6	B(6)
1225	REF	1			E5,1656	ZSM	EQUALS	YSM	+6	B(6)
1226	REF	1			E5,1664	XDC	EQUALS	ZSM	+6	B(6)
1227	REF	1			E5,1672	YEC	EQUALS	XEC	+6	B(6)
1228	REF	1			E5,1700	ZDC	EQUALS	YEC	+6	B(6)
1229	REF	2	LAST	124	E5,1664	XNB	=	XDC		
1230	REF	2	LAST	124	E5,1672	YNE	=	YDC		
1231	REF	1			E5,1700	ZNB	=	ZDC		

R1232 OVERLAYS WITHIN ALIGNMENT/SYSTEST/CALCSMSC COMMON STORAGE. (4C)

1234	REF	2	LAST	124	E5,1644	-CCSB	EQUALS	XSM	+2	(2)TMP
1235	REF	1			E5,1646	SINB	EQUALS	-CCSB	+2	(2)TMP

R1236 MORE OVERLAYS TO ALIGNMENT /SYSTEST (THESE ARE P52) (6C)

1238	REF	1			E5,1706	LANDLAT	EQUALS	STARAD		(2) LATITUDE, LONGITUDE
1239	REF	1			E5,1710	LANDLONG	EQUALS	LANDLAT	+2	(2) AND ALTITUDE
1240	REF	1			E5,1712	LANDALT	EQUALS	LANDLONG	+2	(2) OF LANDING SITE

A1241

P1242 ALIGNMENT/SYSTEST COMMON STORAGE. (21D)

1244	REF	2	LAST	124	E5,1706	STARAD	EQUALS	ZEC	+6	I(18D)TMP
1245	REF	2	LAST	124	E5,1730	STAR	EQUALS	STARAD	+18D	I(6)
1246	REF	1			E5,1736	GCTR	EQUALS	STAR	+6	B(1)
1247	REF	1			E5,1737	OGC	EQUALS	GCTR	+1	I(2)
1248	REF	1			E5,1741	IGC	EQUALS	OGC	+2	I(2)
1249	REF	1			E5,1743	MGC	EQUALS	IGC	+2	I(2)

R1250 P57 ALIGNMENT (OVERLAY OF ALIGNMENT/SYSTEST COMMON STORAGE) (12C)

1252	REF	3	LAST	124	E5,1706	GACC	=	STARAD		(6) SS
1253	REF	4	LAST	124	E5,1714	GCLT	=	STARAD	+6	(6) SS

A1254

R1255 OVERLAYS WITHIN ALIGNMENT/SYSTEST COMMON STORAGE (24C)

1257	REF	5	LAST	124	E5,1706	VEARTH	EQUALS	STARAD		(6)TMP
1258	REF	1			E5,1714	VSUN	EQUALS	VEARTH	+6	(6)TMP
1259	REF	1			E5,1722	VMCCN	EQUALS	VSUN	+6	(6)TMP

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1260 REF 1 F5,1730 SAX EQUALS VMCON +6 (6)TMP

R1261 P50'S, REC'S Q STORES. (2C)

1263 REF 1 F5,1745 QMIN EQUALS MGC +2 B(1)TMP

1264 REF 1 F5,1746 QMAJ EQUALS QMIN +1 B(1)TMP
R1265

R1266 **** USED IN F50S **** (SCATTERED OVERLAYS)

1267 REF 6 LAST 124 F5,1706 XSCI EQUALS STAPAE

1268 REF 1 F5,1714 YSCI EQUALS XSCI +6

1269 REF 1 F5,1714 ZSCI EQUALS YSCI

1270 REF 2 LAST 124 F5,1706 CULTRIX EQUALS VEARTH VEARTH, VSLN, VMCON

A1271

R1272 ALIGNMENT STORAGE. (23C)

1274 REF 1 F5,1747 OGCT EQUALS QMAJ +1 I(6)

1275 REF 1 F5,1755 BESTI EQUALS OGCT +6 I(1)

1276 REF 1 F5,1756 BESTJ EQUALS BESTI +1

1277 REF 1 F5,1757 STARIND EQUALS BESTJ +1

R1278 RETAIN THE CDRP OF STARS AV1 TO STARS AV2 +5 FOR DOWNLINK PURPOSES.

1279 REF 1 F5,1760 STARS AV1 EQUALS STARIND +1 I(6)

1280 REF 1 F5,1766 STARS AV2 EQUALS STARS AV1 +6 I(6)

1281 REF 1 F5,1774 TALIGN EQUALS STARS AV2 +6 B(2) TIME OF IMU ALIGNMENT (DOWNLINKED)

A1282

R1283 P32-35 + SERVICE (2C)

1285 REF 1 F5,1776 RTX1 EQUALS TALIGN +2 I(1) X1 -2 EARTH, -10 MOON

1286 REF 1 F5,1777 RTX2 EQUALS RTX1 +1 I(1) X2 0 EARTH, 2 MOON

A1287

1288 0026 ZPRIME = 220

1289 0026 PCA = 220

1290 0020 CCSTH = 160

1291 0022 SINTH = 180

1292 0024 THETA = 200

1293 0040 STARN = 320

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P1294 ***** OVERLAY NUMBER 2 IN BANK 5 *****

P1295 CONICS ROUTINE STORAGE.

(85C)

1297	REF	2	LAST	124	F5,1642	DELX	EQUALS	FNPW		I(2)TMP
1298	REF	1			F5,1644	DELT	EQUALS	DELX	+2	I(2)TMP
1299	REF	1			F5,1646	UPRECT	EQUALS	DELT	+2	I(6)TMP
1300					0042	RCDRM	EQUALS	340		I(2)TMP
1301	REF	1			F3,1552	XPPEV	EQUALS	XKEP		I(2)TMP
1302	REF	1			F5,1654	R1VEC	EQUALS	URRECT	+6	I(6)TMP
1303	REF	1			F5,1662	R2VEC	EQUALS	R1VEC	+6	I(6)TMP
1304	REF	1			F5,1670	TDESIRE	EQUALS	R2VEC	+6	I(2)TMP
1305	REF	1			F5,1672	GEOMSGN	EQUALS	TDESIRE	+2	I(1)TMP
1306	REF	1			F5,1673	UN	EQUALS	GEOMSGN	+1	I(6)TMP
1307	REF	1			F5,1701	VTARGET	EQUALS	LN	+5	I(1)TMP
1308	REF	1			F5,1702	VTARGET	EQUALS	VTARGET	+1	I(6)TMP
1309	REF	1			F5,1710	RTNLAMB	EQUALS	VTARGET	+6	I(1)TMP
1310	REF	1			F5,1711	U2	EQUALS	RTNLAMB	+1	I(6)TMP
1311	REF	1			F5,1717	MAGVEC2	EQUALS	U2	+6	I(2)TMP
1312	REF	1			F5,1721	UR1	EQUALS	MAGVEC2	+2	I(6)TMP
1313	REF	1			F5,1727	SNTH	EQUALS	UR1	+6	I(2)TMP
1314	REF	1			F5,1731	CSTH	EQUALS	SNTH	+2	I(2)TMP
1315	REF	1			F5,1733	1-CSTH	EQUALS	CSTH	+2	I(2)TMP
1316	REF	1			F5,1735	CSTH-RHC	EQUALS	1-CSTH	+2	I(2)TMP
1317	REF	1			F5,1737	P	EQUALS	CSTH-RHC	+2	I(2)TMP
1318	REF	1			F5,1741	R1A	EQUALS	P	+2	I(2)TMP
1319	REF	2	LAST	126	F5,1654	PVEC	EQUALS	P1VEC		I(6)TMP
1320	REF	1			F5,1743	VVEC	EQUALS	R1A	+2	I(6)TMP
1321	REF	2	LAST	126	F5,1710	RTNTT	EQUALS	PTNLAMB		I(1)TMP
1322	REF	1			F5,1751	ECC	EQUALS	VVEC	+6	I(2)TMP
1323	REF	3	LAST	126	F5,1710	RTNTR	EQUALS	RTNLAMB		I(1)TMP
1324	REF	4	LAST	126	F5,1710	RTNAPSE	EQUALS	RTNLAMB		I(1)TMP
1325	REF	2	LAST	126	F5,1717	R2	EQUALS	MAGVEC2		I(2)TMP
1326	REF	1			F5,1753	RTNPRM	EQUALS	ECC	+2	I(1)TMP
1327	REF	1			F5,1754	SGNRDCT	EQUALS	RTNPRM	+1	I(1)TMP
1328	REF	1			F5,1755	PDFSIRE	EQUALS	SGNRDCT	+1	I(2)TMP
1329	REF	1			F5,1757	DELCEP	EQUALS	PDFSIRE	+2	I(2)TMP
1330	REF	1			F5,1761	DEPREV	EQUALS	DELCEP	+2	I(2)TMP
1331	REF	2	LAST	126	F5,1757	TFRRLAMB	EQUALS	DELCEP		I(2)TMP
1332	REF	1			F5,1761	TPREV	EQUALS	DEPREV		I(2)TMP
1333	REF	2	LAST	126	F5,1763	EPS1ICNL	EQUALS	DEPREV	+2	I(2)TMP
1334	REF	1			F5,1765	CCCA	EQUALS	EPS1ICNL	+2	I(2)CTAN OF INITIAL FLIGHT PATH ANGLE.
1335	REF	1			F5,1765	1NDEP	EQUALS	CCCA		USED BY SUBROUTINE 'ITERATOR'.

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P1336 ***** CUEPLAY NUMBER 3 IN EPANK 5 *****

R1337 INCOFF STORAGE. (18C)

1339 REF 3 LAST 126 E5,1642 ZI EQUALS ENDW I(18)TMP

R1340 INCOFF/LSP22.3 STORAGE. (21D)

1342 REF 1 E5,1664 DELTAX EQUALS ZI +18D I(18)

1343 REF 1 E5,1706 VARIANCE EQUALS DELTAX +1ED I(2)

R1344 MEASUREMENT INCORPORATION -R22- STORAGE. (49C)

1346 REF 1 E5,1711 GRP2SVG EQUALS VARIANCE +2 I(1)TMP GSAVE FOR RESTARTS

1347 REF 1 E5,1712 CMEGAM1 EQUALS GRP2SVG +1 I(6)

1348 REF 1 E5,1720 CMEGAM2 EQUALS CMEGAM1 +6 I(6)

1349 REF 1 E5,1726 CMEGAM3 EQUALS CMEGAM2 +6 I(6)

1350 REF 1 E5,1734 HOLDW EQUALS CMEGAM3 +6 I(18)

1351 REF 1 E5,1756 TDPOS EQUALS HOLDW +18D I(6)

1352 REF 1 E5,1764 TDVFL EQUALS TDPOS +6 I(6)

A1353

1354 REF 2 LAST 127 E5,1664 TRIPA EQUALS DELTAX I(3)TMP

1355 REF 1 E5,1667 TEMPVAR EQUALS TRIPA +2 I(3)TMP

A1356

P1357 INCORPORATION/INTEGRATION 6 STORAGE. (1C)

1359 REF 1 E5,1772 EGRESS EQUALS TDVFL +6 I(1)

A1360

R1361 F30/P31 STORAGE. (1C) AND ONE OVERLAY

1363 REF 1 E5,1773 P30EXIT EQUALS EGRESS +1 E(1)TMP

A1364

1365 REF 1 E5,1773 ORIGIN EQUALS P30EXIT I(1)TMP INDEX DURING INITVEL

A1366

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PI167 SYSTEM TEST FRASABLES. CAN OVERLAY W MATRIX. (1270)

R1369 ***** OVERLAY NUMBER 1 IN FRANK 5 *****

1370	REF	3	LAST	122	F5,1400	AZIMUTH	EQUALS	W	2
1371	REF	1			F5,1402	LATITUDE	EQUALS	AZIMUTH +2	2
1372	REF	1			F5,1404	PERVECTOR	EQUALS	LATITUDE +2	6
1373	REF	1			F5,1412	LENGTHCT	EQUALS	PERVECTOR +6	1
1374	REF	1			F5,1413	LOSVEC	EQUALS	LENGTHCT +1	6
1375	REF	1			F5,1414	NDXCTR	EQUALS	LOSVEC +1	1
1376	REF	1			F5,1415	PIPINDEX	EQUALS	NDXCTR +1	1
1377	REF	1			F5,1416	POSITION	EQUALS	PIPINDEX +1	1
1378	REF	1			F5,1417	QPLACE	EQUALS	POSITION +1	1
1379	REF	1			F5,1420	QPLACES	EQUALS	QPLACE +1	1
1380	REF	1			F5,1421	SOUTHDR	EQUALS	QPLACES +1	7
1381	REF	1			F5,1430	TEMPTIME	EQUALS	SOUTHDR +7	2
1382	REF	1			F5,1432	TMARK	EQUALS	TEMPTIME +2	2
1383	REF	1			F5,1434	GENPL	EQUALS	TMARK +2	
1384	REF	1			F5,1434	CDLTIME1	=	GENPL	
1385	REF	2	LAST	128	F5,1436	CDLTIMEF	=	GENPL +2	
1386	REF	3	LAST	128	F5,1440	CDUCANG	=	GENPL +4	
1387	REF	4	LAST	128	F5,1441	CDLREADF	=	GENPL +5	
1388	REF	5	LAST	128	F5,1442	CDUREAD1	=	GENPL +6	
1389	REF	6	LAST	128	F5,1443	CDULIMIT	=	GENPL +7	
1390	REF	7	LAST	128	F5,1440	TEMPACC	=	GENPL +4	
1391	REF	8	LAST	128	F5,1441	TEMP	=	GENPL +5	
1392	REF	9	LAST	128	F5,1442	NCRITS	=	GENPL +6	
1393	REF	10	LAST	128	F5,1443	CHAN	=	GENPL +7	
1394	REF	11	LAST	128	F5,1444	LCS1	=	GENPL +80	
1395	REF	12	LAST	128	F5,1452	LCS2	=	GENPL +140	
1396	REF	13	LAST	128	F5,1460	CALCCIR	EQUALS	GENPL +200	
1397	REF	14	LAST	128	F5,1461	CDUFLAG	EQUALS	GENPL +210	
1398	REF	15	LAST	128	F5,1462	GYTOBETG	EQUALS	GENPL +220	
1399	REF	16	LAST	128	F5,1463	CPTNREC	EQUALS	GENPL +230	
1400	REF	17	LAST	128	F5,1464	SAVE	EQUALS	GENPL +240	THREE CNSEC LCC
1401	REF	18	LAST	128	F5,1467	SECONST1	EQUALS	GENPL +270	
1402	REF	19	LAST	128	F5,1470	TIMER	EQUALS	GENPL +280	
1403	REF	20	LAST	128	F5,1472	DATAFL	EQUALS	GENPL +300	
1404	REF	21	LAST	128	F5,1434	RESP	EQUALS	GENPL	FIX LA FP POSSIBLY KEEP1
1405	REF	22	LAST	128	F5,1534	MASKREG	EQUALS	GENPL +540	
1406	REF	23	LAST	128	F5,1536	CDLNCX	EQUALS	GENPL +660	
1407	REF	24	LAST	128	F5,1537	RESULTCT	EQUALS	GENPL +670	
1408	REF	25	LAST	128	F5,1542	CDLNTPL	EQUALS	GENPL +700	
1409	REF	26	LAST	128	F5,1543	CDUANG	EQUALS	GENPL +710	

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EC 54

1410	REF	27	LAST	128	F5,1434	AINLA	=	GENPL	110 DE CR 156 CCT LOCATIONS
1411	REF	1			F5,1434	WANGT	EQUALS	AINLA	VERT E ATE
1412	REF	2	LAST	129	F5,1436	WANGT	EQUALS	AINLA +20	HORIZTAL ERATE
1413	REF	3	LAST	129	F5,1440	WANGT	EQUALS	AINLA +40	T
1414	REF	1			F5,1440	TCRQNDX	=	WANGT	
1415	REF	4	LAST	129	F5,1442	DRIFTT	EQUALS	AINLA +60	
1416	REF	5	LAST	129	F5,1444	ALXIS	EQUALS	AINLA +80	
1417	REF	6	LAST	129	F5,1445	CMPLX	EQUALS	AINLA +90	INC
1418	REF	7	LAST	129	F5,1446	ALK	EQUALS	AINLA +100	GAINS
1419	REF	8	LAST	129	F5,1462	VLAUNS	EQUALS	AINLA +220	
1420	REF	9	LAST	129	F5,1464	WPLATC	EQUALS	AINLA +240	
1421	REF	10	LAST	129	F5,1470	INTY	EQUALS	AINLA +280	SOUTH IF INTF
1422	REF	11	LAST	129	F5,1472	ANGZ	EQUALS	AINLA +300	EAST A IS
1423	REF	12	LAST	129	F5,1474	INTZ	EQUALS	AINLA +320	EAST F P I
1424	REF	13	LAST	129	F5,1476	ANGY	EQUALS	AINLA +340	SOUTH
1425	REF	14	LAST	129	F5,1500	ANGX	EQUALS	AINLA +360	VE
1426	REF	15	LAST	129	F5,1502	DRIFTC	EQUALS	AINLA +380	VERT
1427	REF	16	LAST	129	F5,1504	DRIFTI	EQUALS	AINLA +400	SCU
1428	REF	17	LAST	129	F5,1510	VIALN	EQUALS	AINLA +440	
1429	REF	18	LAST	129	F5,1512	ACCWC	EQUALS	AINLA +460	
1430	REF	19	LAST	129	F5,1520	PCSNV	EQUALS	AINLA +520	
1431	REF	20	LAST	129	F5,1522	DRIPAY	EQUALS	AINLA +540	SOUTH
1432	REF	21	LAST	129	F5,1526	DRIPAZ	EQUALS	AINLA +560	NORTH IF INCREMENT
1433	REF	22	LAST	129	F5,1530	ALTIM	EQUALS	AINLA +600	
1434	REF	23	LAST	129	F5,1531	ALTIMS	EQUALS	AINLA +610	INDEX
1435	REF	24	LAST	129	F5,1532	ALCK	EQUALS	AINLA +620	TIME CONSTAN
1436	REF	25	LAST	129	F5,1550	DELY	EQUALS	AINLA +760	
1437	REF	26	LAST	129	F5,1560	WPLATI	EQUALS	AINLA +840	
1438	REF	27	LAST	129	F5,1562	GEOCOMPS	EQUALS	AINLA +860	
1439	REF	28	LAST	129	F5,1563	ERCOMP	EQUALS	AINLA +870	
1440	REF	29	LAST	129	F5,1571	ZERONDX	EQUALS	AINLA +930	
1441	REF	1			F5,1452	THETAN	=	ALK +4	
1442	REF	1			F5,1460	FILDELV	EQUALS	THETAN +6	AGS ALIGNMENT STORAGE
1443	REF	1			F5,1462	INTVEC	EQUALS	FILDELV +2	
1444	REF	30	LAST	129	F5,1572	1SECXT	=	AINLA +940	
1445	REF	31	LAST	129	F5,1573	ASECXT	=	AINLA +950	
1446	REF	32	LAST	129	F5,1574	PERFLAY	EQUALS	AINLA +960	B(2) DELAY TIME BEF. START DRIFT MEASURE
1447	REF	33	LAST	129	F5,1576	OVFLOWCK	EQUALS	AINLA +980	(1) SET MEANS OVERFLOW IN IMU PERF TEST
A1448									AND CAUSES TERMINATION
A1449									
1450	REF	2	LAST	125	F5,1774	END-E5	EQUALS	STARSAV2 +6	*** FIRST FREE LOCATION IN E5***

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P1451 DBANK-F ASSIGNMENTS.

1452 F6,1410 SETLCC 3000

R1453 DAP PAD-LOADED DATA.

(100)

R1455 ALL OF THE FOLLOWING EXCEPT PITTIME AND ROLLTIME ARE INITIALIZED IN FRESH START TO PERMIT IMMEDIATE USE OF DAP

1457	F6,1410	F6,1400	HIASCENT	ERASE	(1) MASS AFTER STAGING, SCALE AT B16 KC.
1458	F6,1411	F6,1401	ROLLTIME	ERASE	(1) TIME TO TRIM Z GIMBAL IN RC3, CSEC.
1459	F6,1412	F6,1402	PITTIME	ERASE	(1) TIME TO TRIM Y GIMBAL IN RC3, CSEC.
1460	F6,1413	F6,1403	CKTRAP	ERASE	(1) DAP STATE (PCSSIELE 77001
1461	F6,1414	F6,1404	CKCMEGAN	ERASE	(1) ESTIMATOR PARA- (VALUES CC012
1462	F6,1415	F6,1415	DKKAO5N	ERASE	(1) METERS FOR THE 00074
1463	F6,1416	F6,1406	LNTRAF	ERASE	(1) LOCKED AND 77001
1464	F6,1417	F6,1407	LNCMEGAN	ERASE	(1) LEM-ALONE CASES CC060
1465	F6,1418	F6,1410	LMKAO5N	ERASE	(1) RESPECTIVELY 00074
1466	F6,1411	F6,1411	CKCB	ERASE	(1) WIDTH OF DEADBAND FOR DCKED RC5
A1467					AUTCPILCT (DE=1.4DEG IN FRESH START)
A1468					DEADBAND = FI/DKDB FAC.

R1469 PADLOADS FOR INITIALIZATION OF DAP PIAS ACCELERATION (AT P12 IGNITION) (20)

1471	F6,1412	F6,1412	ICNAOSQ	ERASE	B(1)PL
1472	F6,1413	F6,1413	ICNACSP	ERASE	R(1)PL
A1473					

R1474 AXIS TRANSFORMATION MATRIX - GIMBAL TO PILOT AXES:

(50)

1476	F6,1414	F6,1414	M11	ERASE	SCALED AT 1
1477	F6,1415	F6,1415	M21	ERASE	SCALED AT 1
1478	F6,1416	F6,1416	M31	ERASE	
1479	F6,1417	F6,1417	M22	ERASE	SCALED AT 1.
1480	F6,1420	F6,1420	M22	ERASE	SCALED AT 1.

R1481 ANGLE MEASUREMENTS.

(310)

1483		F6,1421	F6,1425	CMEGAF	ERASE +4	BCDY-AXIS RCT. RATES SCALED AT PI/4 AND
1484	REF 1	F6,1422		CMEGAG	EQUALS CMEGAF +1	BCDY-AXIS ACCELERATIONS SCALED AT PI/8
1485	REF 2 LAST 130	F6,1423		CMEGAF	EQUALS CMEGAF +2	
R1486	RETAIN THE ORDER OF ALPHAG AND ALPHAR FOR DOWNLINK PURPOSES.					
1487	REF 3 LAST 130	F6,1424		ALPHAG	EQUALS CMEGAF +3	
1488	REF 4 LAST 130	F6,1425		ALPHAR	EQUALS CMEGAF +4	
1489		F6,1426	F6,1427	OMEGAL	ERASE +1	
1490	REF 1	F6,1427		OMEGAV	= OMEGAU +1	
1491		F6,1430	F6,1435	TRAPECP	ERASE +5	
1492	REF 1	F6,1431		TRAPECP	= TRAPECP +1	
1493	REF 2 LAST 130	F6,1432		TRAPECP	= TRAPECP +2	
1494	REF 3 LAST 130	F6,1433		NPTRAFS	= TRAPECP +3	

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1495	REF	4	LAST	130	F6,1434		NGTRAPS	=	TRAPECP	+4	
1496	REF	5	LAST	131	F6,1435		NRTRAPS	=	TRAPECP	+5	
1497	REF	1			F6,1427		EDOTP	=	EDOT		
1498					F6,1426	E6,1437	EDOTQ	ERASE	+1		
1499	REF	1			F6,1437		EDOTR	=	EDOTQ	+1	MANY SHARING NAMES
1500	REF	2	LAST	131	F6,1436		ORATECIF	EQUALS	EDOTQ		ALTERNATIVE NAMES:
1501	REF	1			F6,1437		RRATECIF	EQUALS	EDOTR		DELETE WHEN NO. OF REFERENCES = 0
1502	REF	2	LAST	130	F6,1426		URATECIF	EQUALS	OMEGAL		
1503	REF	1			F6,1427		VPATECIF	EQUALS	OMEGAV		
1504					F6,1440	E6,1442	OLDXFCRP	ERASE	+2		STORED CDU READINGS FOR STATE
1505	REF	1			F6,1441		OLDYFCRP	EQUALS	OLDXFCRP	+1	DERIVATIONS: SCALED AT PI RADIANS (2'S)
1506	REF	2	LAST	131	F6,1442		OLDZFCRP	EQUALS	OLDXFCRP	+2	
R1507	RATE-COMMAND AND MINIMUM IMPULSE MODES										
1508					F6,1443	F6,1443	CH31TEMP	ERASE			
1509					F6,1444	F6,1444	STIKSENS	ERASE			
1510					F6,1445	F6,1445	TCP	ERASE			
1511					F6,1446	F6,1453	DXERRCR	ERASE	+5		
1512	REF	1			F6,1451		DYERRCR	EQUALS	DXERRCR	+2	
1513	REF	2	LAST	131	F6,1452		LZERRCR	EQUALS	DXERRCR	+4	
1514					F6,1454	F6,1454	PLAST	ERASE			
1515					F6,1455	F6,1455	QLAST	ERASE			
1516					F6,1456	F6,1456	RLAST	ERASE			
1517					F6,1457	F6,1457	TCQR	ERASE			
R1518	OTHER VARIABLES. (5C)										
1520					F6,1460	F6,1460	CLDPMIN	ERASE			THESE THREE USED IN MIN IMPULSE MODE.
1521					F6,1461	F6,1461	CLDQRMIN	ERASE			
1522	REF	1			F6,1467		TEMP31	EQUALS	DAPTEMP1		
1523					F6,1462	F6,1463	SAVEHAND	ERASE	+1		
1524					F6,1464	F6,1464	PERROR	ERASE			
1525	REF	1			F6,1451		GERRCR	EQUALS	DYFRPCR		
1526	REF	1			F6,1452		RERRCR	EQUALS	DZFFPCR		
R1527	JET STATE CHANGE VARIABLES- TIME (TCFJTCHG), JET BITS WRITTEN NOW (10C)										
R1528	(JTSOONOW), AND JET BITS WRITTEN AT T6 RUPT (JTSATCF). (10C)										
1530					F6,1465	F6,1465	NXT6ACR	ERASE			
1531					F6,1466	F6,1467	T6NEXT	ERASE	+1		
1532					F6,1470	F6,1471	T6FURTHA	ERASE	+1		
1533					F6,1472	F6,1474	NEXTP	ERASE	+2		
1534	REF	1			F6,1473		NEXTU	=	NEXTP	+1	
1535	REF	2	LAST	131	F6,1474		NEXTV	=	NEXTP	+2	
1536					F6,1475	F6,1476	-2JETLIN	ERASE	+1		RATE COMMAND 4-JET RATE DIFFERENCE LIMIT
1537	REF	1			F6,1476		-RATECB	EQUALS	-2JETLIN	+1	AND RATE DEADBAND FOR ASCENT OR DESCENT
1538	REF	1			F6,1476		TARGETDB	EQUALS	-RATECB		MAN. CONTROL TARGET DE COMPLEMENT.
R1539	*** G,R AXIS ERASABLES *** (3)										

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1541	REF	13	LAST	87	4742	PBIT	EQUALS	BIT10	
1542	REF	13	LAST	87	4741	GRBIT	EQUALS	PIT11	
1543	REF	1			F6,1751	VERRCR	EQUALS	CAPTREG5	U,V-AXES ATT ERROR FOR RCS CONTROL LAWS
1544	REF	1			F6,1752	VERRCR	=	VERROR +1	
1545					F6,1477	RFTJACR	ERASE		
1546	REF	1			F6,1742	TEMPALM	EQUALS	DAPTEMP4	
1547	REF	1			F6,1743	NUMBERT	EQUALS	DAPTEMP5	
1548	REF	1			F6,1744	ROTINDEX	EQUALS	DAPTEMP6	
1549	REF	2	LAST	131	F6,1737	ROTEMP1	EQUALS	DAPTEMP1	
1550	REF	1			F6,1740	ROTEMP2	EQUALS	DAPTEMP2	
1551	REF	1			F6,1741	POLYTEMP	EQUALS	DAPTEMP3	
1552					F6,1500	SENSETYP	EPASE		
1553	REF	3	LAST	132	F6,1737	ABSTJ	EQUALS	DAPTEMP1	ABS VALUE OF JET-FIRING TIME
1554	REF	4	LAST	132	F6,1737	ABSEDOTP	EQUALS	DAPTEMP1	
1555	REF	1			F6,1753	DPSBURN	EQUALS	DAPTRFG4	USED WITH SNUFFBIT. VERY TEMPORARY.

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P1556 TRIM GIMBAL CONTROL LAW ERASABLES:

(110)

1558	REF	5	LAST	132	F6,1737	GTSTEMPS	EQUALS	DAPTEMP1	GTS IS PART OF THE JASK.
1559	REF	1			F6,1741	SHFTFLAG	EQUALS	GTSTEMPS +2	COUNT BITS FOR GTSQRT SHIFTING.
1560	REF	2	LAST	133	F6,1744	ININDEX	EQUALS	GTSTEMPS +5	INDEX FOR SHIFT LOOP IN GTSQRT.
1561	REF	1			F6,1746	SAVESR	EQUALS	AXISCTR	CANNOT BE A DAPTEMP - GTS USES THEM ALL.
1562	REF	3	LAST	133	F6,1746	SCRATCH	EQUALS	GTSTEMPS +7	ROOTCYCL ERASABLE
1563	REF	4	LAST	133	F6,1747	HALFARG	EQUALS	GTSTEMPS +8C	ROOTCYCL ERASABLE.
1564	REF	5	LAST	133	F6,1737	K2THETA	EQUALS	GTSTEMPS	D.P., K*ERRCP, NEGUSUM
1565	REF	6	LAST	133	F6,1741	KCENTRAL	EQUALS	GTSTEMPS +2	S.P., K FROM KG OR KRDAF, AT PI/2(8)
1566	REF	7	LAST	133	F6,1742	K2CENTRAL	EQUALS	GTSTEMPS +3	D.P., GTS SCRATCH CELLS.
1567	REF	8	LAST	133	F6,1743	WCENTRAL	EQUALS	GTSTEMPS +4	S.P., OMEGA, AT PI/4 RAD/SEC
1568	REF	9	LAST	133	F6,1744	ACENTRAL	EQUALS	GTSTEMPS +5	S.P., ALPHA, AT PI/4 RAD/SEC(2)
1569	REF	10	LAST	133	F6,1745	DEL	EQUALS	GTSTEMPS +6	S.P., SGN FUNCTION VALUE.
1570	REF	11	LAST	133	F6,1746	A2CENTRAL	EQUALS	GTSTEMPS +7	D.P., GTS SCRATCH CELLS.
1571	REF	12	LAST	133	F6,1751	QPCNTR	EQUALS	GTSTEMPS +9C	S.P., INDEX FOR GTS LOOP THROUGH Q,R AXES
1572	REF	13	LAST	133	F6,1751	FUNCTION	EQUALS	GTSTEMPS +10D	D.P., ARGUMENT FOR GRSCRT, SCRATCH FOR GTS
1573					F6,1501	NEGUG	ERASE	+2	NEGATIVE OF G-AXIS GIMBAL DRIVE
A1574								NEGUG +1	DEFINIC AND USED ELSEWHERE
1575	REF	1			F6,1513	NEGUR	EQUALS	NEGUG +2	NEGATIVE OF R-AXIS GIMBAL DRIVE
1576					F6,1514	KG	ERASE	+2	S.P., JERK TERM FOR GTS, AT PI/2(8)
1577	REF	1			F6,1515	AXISCTR	EQUALS	KG +1	
1578	REF	2	LAST	133	F6,1516	KRDAP	EQUALS	KG +2	.3 ACCDCTR SCALED AT PI/2(8)
1579					F6,1517	ACCDCTQ	ERASE	+3	Q-JERK SCALED AT PI/2(7) UNSIGNED
1580	REF	1			F6,1517	QACCDCT	EQUALS	ACCDCTQ +1	G-JERK SCALED AT PI/2(7) SIGNED
1581	REF	2	LAST	133	F6,1511	ACCDCTR	EQUALS	ACCDCTQ +2	R-JERK SCALED AT PI/2(7) UNSIGNED
1582	REF	3	LAST	133	F6,1512	RACCDCT	EQUALS	ACCDCTQ +3	R-JERK SCALED AT PI/2(7) SIGNED
1583	REF	1			F6,1450	QDIFF	EQUALS	GERRCP	ATTITUDE ERRORS:
1584	REF	1			F6,1452	RDIFF	EQUALS	REERRCP	SCALED AT PI RADIANS

A1585

R1586 TORQUE VECTOR RECONSTRUCTION VARIABLES:

(180)

1588	REF	1			F6,1745	JETRATE	EQUALS	DAPTEMP1	
1589	REF	1			F6,1746	JETRATEQ	EQUALS	JETRATE +1	THE LAST CONTROL SAMPLE PERIOD OF 100 MS
1590	REF	2	LAST	133	F6,1747	JETRATER	EQUALS	JETRATE +2	SCALED AT PI/4 RADIANS/SECOND
1591					F6,1513	DOWNTRK	ERASE	+5	ACCUMULATED JET TORQUE COMMANDED ABOUT
1592	REF	1			F6,1513	POSTCRKE	EQUALS	DOWNTRK	+, -P, +, -U, +, -V RESPECTIVELY.
1593	REF	2	LAST	133	F6,1514	NEGOTKRP	EQUALS	DOWNTRK +1	EMPLOYED EXCLUSIVELY FOR DOWNLIST.
1594	REF	3	LAST	133	F6,1515	POSTORKU	EQUALS	DOWNTRK +2	NOT INITIALIZED; PERMITTED TO OVERFLOW

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1595	REF	4	LAST	133	E6,1516	NEGTRK1	EQUALS	DCWNTCRK	+3	SCALED AT 32 JET-SEC, CR ABOUT 2.0 JET-MSEC PER BIT.
1596	REF	5	LAST	134	E6,1517	PCSTCRKV	EQUALS	DCWNTCRK	+4	
1597	REF	6	LAST	134	E6,1520	NEGTRKV	EQUALS	DCWNTCRK	+5	
1598					E6,1521	E6,1523	NC.PJETS	ERASE	+2	
1599	REF	1			E6,1522		NC.UJETS	=	NC.PJETS +1	
1600	REF	1			E6,1523		NC.VJETS	=	NC.UJETS +1	
1601					E6,1524	E6,1526	TJP	ERASE	+2	
1602	REF	1			E6,1525		TJU	=	TJP +1	
1603	REF	2	LAST	134	E6,1526		TJV	=	TJP +2	
1604					E6,1527	E6,1527	L,PVT-CG	ERASE		
1605					E6,1530	E6,1534	1JACC	ERASE	+4	ACCELERATIONS DUE TO 1 JET TORQUING SCALED AT PI/4 RADIAN/SEC
1606	REF	1			E6,1531		1JACQ	EQUALS	1JACC +1	
1607	REF	2	LAST	134	E6,1532		1JACCF	EQUALS	1JACC +2	
1608	REF	3	LAST	134	E6,1533		1JACCL	EQUALS	1JACC +3	FOR U,V-AXES THE SCALE FACTOR IS DIFF: SCALED AT PI/2 RADIAN/SEC (FOR ASC)
1609	REF	4	LAST	134	E6,1534		1JACCV	EQUALS	1JACC +4	
R1610	ASCENT VARIABLES:									(100)
A1612										
1613					E6,1535	E6,1536	SKIPU	ERASE	+1	
1614	REF	1			E6,1536		SKIPV	=	SKIPU +1	
R1615	THE FOLLOWING LM CAP ERASABLES ARE ZEROED IN THE STARTUP SECTION OF THE DAPICLER PROGRAM AND THE CCSTASC									
R1617	SECTION OF THE ACSTASC. THE ORDER MUST BE PRESERVED FOR THE INDEXING METHODS WHICH ARE EMPLOYED IN THOSE									
R1619	SECTIONS AND ELSEWHERE.									
1620					E6,1537	E6,1544	ACSQ	ERASE	+5	OFFSET ACC. ESTIMATES, UPDATED IN C.P., AND SCALED AT PI/2.
1621	REF	1			E6,1541		ACSR	EQUALS	ACSQ +2	
1622	REF	2	LAST	134	E6,1543		ACSU	EQUALS	ACSQ +4	UV-AXES OFFSET ACC. FROMED BY VECTOR ADDITION OF G,R. AT PI/2 RAD/SEC(2).
1623	REF	3	LAST	134	E6,1544		ACSV	EQUALS	ACSQ +5	
1624					E6,1545	E6,1546	ACSQTERM	ERASE	+1	(.1-.05K)ACS
1625	REF	1			E6,1546		ACSRTERM	EQUALS	ACSQTERM +1	SCALED AT PI/4 RADIAN/SEC.
R1626	FOR TJFT LAW SUBROUTINE:									(TEMPS ONLY)
A1628										
1629	REF	6	LAST	133	E6,1737		NUMBERT	EQUALS	DAPTEMP5	DEFINED IN GRAXIS.
1630	REF	2	LAST	132	E6,1740		EDOTSQ	EQUALS	DAPTEMP1	
1631	REF	2	LAST	132	E6,1741		RCISENSE	EQUALS	DAPTEMP2	LOCKED AT BY FAXIS.
1632	REF	2	LAST	132	E6,1742		FIREFCT	EQUALS	DAPTEMP3	
1633	REF	2	LAST	132	E6,1744		TTCAXIS	EQUALS	DAPTEMP4	
1634	REF	2	LAST	132	E6,1745		ADRSCIF2	EQUALS	DAPTEMP6	
1635	REF	1			E6,1746		HCLCQ	EQUALS	DAPTEMP1	
1636	REF	1			E6,1747		ADRSCIF1	EQUALS	DAPTEMP2	
A1637							HH	EQUALS	DAPTEMP3	COUPLE PRECISION
1638	REF	1			E6,1752		HH +1	EQUALS	DAPTEMP4	
1639	REF	2	LAST	131	E6,1427		E	EQUALS	DAPTEMP6	TIME SHARE WITH VERROR
							EDOT	EQUALS	OMEGAV	

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R1640 INPUT TO TJET LAW (PERMANENT ERASABLES).

(48C)

1642	REF	1		E6,1525	TJETU	=	TJU	EQLATE NAMES. INDEXED BY -1, 0, +1.
1643				E6,1547	E6,1626	BLOCKTOP	ERASE +47D	
1644	REF	1		E6,1567		1/ANET1	= BLOCKTOP +16D	THESE 8 PARAMETERS ARE SET UP BY 1/ACCS
1645	REF	1		E6,1570		1/ANET2	= 1/ANET1 +1	FOR MINIMUM JETS ABOUT THE U-AXIS WHEN
1646	REF	2	LAST	135	E6,1573	1/ACCAST	= 1/ANET1 +4	EDCT IS POSITIVE. TJETLAW INDEXES BY
1647	REF	3	LAST	135	E6,1575	ACCECTZ1	= 1/ANET1 +6	ADRSDIFF FROM THESE REGISTERS TO PICK UP
1648	REF	4	LAST	135	E6,1576	ACCECTZ5	= 1/ANET1 +7	PARAMETERS FOR THE PROPER AXIS, NUMBER
1649	REF	5	LAST	135	E6,1601	FIREDB	= 1/ANET1 +10D	OF JETS AND SIGN OF EDCT. THERE ARE 48
1650	REF	6	LAST	135	E6,1613	COASTDB	= 1/ANET1 +12D	REGISTERS IN ALL IN THIS BLOCK.
1651	REF	7	LAST	135	E6,1605	AXISCIST	= 1/ANET1 +14D	FOUR NOT REFERENCED (P-AXIS) ARE FILLED
A1652								IN BY THE FOLLOWING:
1653	REF	2	LAST	135	E6,1547	ACCSWL	= BLOCKTOP	SET BY 1/ACCS TO SHOW WHETHER MAXIMUM
1654	REF	1			E6,1550	ACCSWV	= ACCSWU +1	JETS ARE REQUIRED BECAUSE OF ADS.
1655	REF	3	LAST	135	E6,1555	FLAT	= BLOCKTOP +6	WIDTH OF MINIMUM IMPULSE ZONE.
1656	REF	4	LAST	135	E6,1556	ZONEBLIN	= BLOCKTOP +7	HEIGHT OF MINIMUM IMPULSE ZONE (AT 4 SEC)
1657				E6,1627	E6,1630	COEFFQ	ERASE +1	COEFFQ AND COEFFR ARE USED IN ROT-TOUV
1658	REF	1		E6,1630		COEFFR	EQUALS COEFFQ +1	TO RESOLVE G,R COMPONENTS INTO U,V (CMF).
A1659								

R1660 VARIABLES FOR GTS-GRAXIS CONTROL EXCHANGE.

(4)

1662	REF	2	LAST	133	E6,1592	ALLOWGTS	EQUALS NEGUG +1	INSERT INTO UNUSED LOCATION
1663					E6,1631	E6,1631	CCTRCLR	ERASE
1664					E6,1632	E6,1634	QGIMTIMR	ERASE +2
1665	REF	1			E6,1633		INGTS	EQUALS QGIMTIMR +1
1666	REF	2	LAST	135	E6,1634		RGIMTIMR	EQUALS QGIMTIMR +2

INDICATES WHICH CONTROL SYSTEM TO USE.
G-GIMBAL DRIVE TIMER, DECISECONDS.
INDICATOR OF CURRENT GTS CONTROL.
R-GIMBAL DRIVE TIMER, DECISECONDS.

R1667 PLEASE RETAIN THE ORDER OF CDUXD THRU CDUZO FOR DOWNLINK PURPOSES.

R1668 KALCMANU:DAP INTERFACE.

(9C)

1670				E6,1635	E6,1637	CDUXD	ERASE +2	CDU DESIRED REGISTERS:
1671	REF	1		E6,1636		CDUYD	EQUALS CDUXD +1	SCALED AT PI RADIANS (180 DEGREES)
1672	REF	2	LAST	135	E6,1637	CDLZD	EQUALS CDUXD +2	(STORE IN 2S COMPLEMENT)
1673				E6,1640	E6,1642	DELCDUX	ERASE +2	NEGATIVE OF DESIRED 100MS CDU INCREMENT:
1674	REF	1		E6,1641		DELCDUY	EQUALS DELCDUX +1	SCALED AT PI RADIANS (180 DEGREES)
1675	REF	2	LAST	135	E6,1642	DELCDLZ	EQUALS DELCDLX +2	(STORE IN 2S COMPLEMENT)

R1676 RETAIN THE ORDER OF OMEGAPD TO OMEGARD FOR DOWNLINK PURPOSES.

1677				E6,1643	E6,1645	OMEGAPD	ERASE +2	ATTITUDE MANEUVER DESIRED RATES:
1678	REF	1		E6,1644		OMEGAQD	EQUALS OMEGAPD +1	(NOT EXPLICITLY REFERENCED IN GTS CNTRL)
1679	REF	2	LAST	135	E6,1645	OMEGARD	EQUALS OMEGAPD +2	SCALED AT PI/4 RADIANS/SECOND

R1680 KALCMANU STORACE.

(24C)

1682				E6,1646	E6,1675	MIS	ERASE +23D	I(18D)
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L ERASABLE ASSIGNMENTS

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1683	REF	1		E6,1670	CCF	EQUALS MIS	+18D	I(6)	
R1684 KALCMANU STORAGE. (22C)									
1686				E6,1676 E6,1734	BCDU	ERASE	+30D	B(2)	
1687	REF	1		E6,1701	KSPNDX	EQUALS BCDU	+3	B(1)	
1688	REF	1		E6,1712	KCPNDX	EQUALS KSPNDX	+1	B(1)	
1689	REF	1		E6,1703	TMIS	EQUALS KCPNDX	+1	I(18)	MUST BE IN SAME BANK AS RCS DAP
1690	REF	1		E6,1725	CCFSKEW	EQUALS TMIS	+18D	I(6)	MUST BE IN SAME BANK AS RCS DAP
1691	REF	1		E6,1733	CAM	EQUALS CCFSKEW	+6	I(2)	MUST BE IN SAME BANK AS RCS DAP
1692				E6,1735 E6,1736	AM	ERASE	+1	I(2)	THIS WAS ONCE IN E5 OVERLAYING CGC
A1693									
R1694 FIRST-ORDER OVERPLAYS IN KALCMANU (25C)									
1696	REF	2	LAST	136 E6,1713	KV1	EQUALS TMIS		I(6)	
1697	REF	3	LAST	136 E6,1703	MFISYM	EQUALS TMIS		I	
1698	REF	4	LAST	136 E6,1713	TMFI	EQUALS TMIS		I	
1699	REF	5	LAST	136 E6,1703	NCCU	EQUALS TMIS		B	
1700	REF	6	LAST	136 E6,1706	NEXTIME	EQUALS TMIS	+3	F	
1701	REF	7	LAST	136 E6,1707	TTEMP	EQUALS TMIS	+4	B	
1702	REF	8	LAST	136 E6,1711	KV2	EQUALS TMIS	+6	I(6)	
1713	REF	9	LAST	136 E6,1711	BIASTEMP	EQUALS TMIS	+6	B	
1704	REF	10	LAST	136 E6,1717	KV3	EQUALS TMIS	+12D	I(6)	
1705	REF	11	LAST	136 E6,1717	CGF	EQUALS TMIS	+12C	I	
1706	REF	2	LAST	136 E6,1725	BRATE	EQUALS CCFSKEW		B	
1707	REF	3	LAST	136 E6,1725	IG	EQUALS CCFSKEW		I	
1708	REF	1		E6,1733	TM	EQUALS CAM		P	
R1709 SECOND-ORDER OVERPLAYS IN KALCMANU (24C)									
1711	REF	1		E6,1703	K1	= KV1			
1712	REF	1		E6,1711	K2	= KV2			
1713	REF	1		E6,1717	K3	= KV3			
1714	REF	2	LAST	136 E6,1703	P21	EQUALS KV1		I(2)	
1715	REF	3	LAST	136 E6,1705	D21	EQUALS KV1	+2	I(2)	
1716	REF	4	LAST	136 E6,1707	G21	EQUALS KV1	+4	I(2)	
1717	REF	2	LAST	136 E6,1711	C2SQP	EQUALS KV2		I(2)	
1718	REF	3	LAST	136 E6,1713	C2SQM	EQUALS KV2	+2	I(2)	
1719	REF	4	LAST	136 E6,1715	C2PP	EQUALS KV2	+4	I(2)	
1720	REF	2	LAST	136 E6,1717	C2MP	EQUALS KV3		I(2)	
1721	REF	3	LAST	136 E6,1721	C1PP	EQUALS KV3	+2	I(2)	
1722	REF	4	LAST	136 E6,1723	C1MP	EQUALS KV3	+4	I(2)	

L ERASABLE ASSIGNMENTS

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1723	REF	4	LAST	136	E6,1725	VECQTEMP =	CCFSKEW
1724	REF	2	LAST	135	E6,1635	CCDU =	CDLXC
1725	REF	3	LAST	135	E6,1640	DELCCDU =	DELCDLX
1726	REF	1			E6,1641	DELCCDU1 =	DELCDLX
1727	REF	1			E6,1642	DELCCDU2 =	DELCDLZ

R1728 * * * * *

R1729 STORAGE FOR FINDCDLW

P1730 OVERLAYING KALCMANU STORAGE: (26D)

1732	REF	2	LAST	136	E6,1646	ECCDUW	EQUALS	MIS	
1733	REF	1			E6,1646	ECCDUWLSR	EQUALS	ECCDUW	E(1)TMP
1734	REF	1			E6,1647	QCCDUWUSR	EQUALS	ECCDUWLSR +1	I(1)TMP
1735	REF	1			E6,1650	NDXCELW	EQUALS	QCCDUWUSR +1	B(1)TMP
1736	REF	1			E6,1651	FLAGCCDW	EQUALS	NDXCELW +1	B(1)TMP
1737	REF	1			E6,1652	FLPAUTNC	EQUALS	FLAGCCDW +1	B(1)TMP
1738	REF	1			E6,1653	UNFC/2	EQUALS	FLPAUTNC +1	I(6)IN
1739	REF	1			E6,1661	UNWC/2	EQUALS	UNFC/2 +6	I(6)IN
1740	REF	1			E6,1667	UNFV/2	EQUALS	UNWC/2 +6	I(6)S-S
1741	REF	1			E6,1667	UNFVX/2	=	UNFV/2	
1742	REF	2	LAST	137	E6,1671	UNFVY/2	=	UNFV/2 +2	
1743	REF	2	LAST	137	E6,1673	UNFVZ/2	=	UNFV/2 +4	
1744	REF	4	LAST	137	E6,1675	-DELGMR	EQUALS	UNFV/2 +6	E(3)TMP

R1745
R1746 DEFINED IN THE WORK AREA: (18D)

1748					0000	UNX/2	=	0
1749					0006	UNY/2	=	6
1750					0014	UNZ/2	=	14

R1751
R1752 END OF FINDCCDUW ERASABLES

R1753 * * * * *

R1754 * * * * *

R1755 STORAGE FOR P57

P1756 OVERLAYING KALCMANU AND FINDCDLW STORAGE: (12D)

1758	REF	3	LAST	137	E6,1646	VEC1	EQUALS	MIS	I(6)TMP
1759	REF	1			E6,1654	VEC2	EQUALS	VEC1 +6	I(6)TMP

R1760
R1761 END OF P57 ERASABLES

R1762 * * * * *

L ERASABLE ASSIGNMENTS

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R1763 THE FOLLOWING ARE THE DAP REPLACEMENTS FOR THE ITEMS AND PUPTRGS, NEEDED BECAUSE DAP IS NOW A TOB, JASK, JAB, TCSK
 R1765 ...ANYWAY, THE DAP CAN NOW BE INTERRUPTED. (18C)

1767					F6,1737	F6,1760	DAPTEMP1	ERASE	+17D	
1768	REF	7	LAST	134	F6,1740		DAPTEMP2	EQUALS	DAPTEMP1 +1	
1769	REF	8	LAST	138	F6,1741		DAPTEMP3	EQUALS	DAPTEMP1 +2	
1770	REF	9	LAST	138	F6,1742		DAPTEMP4	EQUALS	DAPTEMP1 +3	
1771	REF	10	LAST	138	F6,1742		DAPTEMP5	EQUALS	DAPTEMP1 +4	
1772	REF	11	LAST	138	F6,1744		DAPTEMP6	EQUALS	DAPTEMP1 +5	
1773	REF	12	LAST	138	F6,1745		DAPTEMP1	EQUALS	DAPTEMP1 +6	
1774	REF	13	LAST	138	F6,1746		DAPTEMP2	EQUALS	DAPTEMP1 +7	
1775	REF	14	LAST	138	F6,1747		DAPTEMP3	EQUALS	DAPTEMP1 +8C	
1776	REF	15	LAST	138	F6,1750		DAPTEMP4	EQUALS	DAPTEMP1 +9C	
1777	REF	16	LAST	138	F6,1751		DAPTEMP5	EQUALS	DAPTEMP1 +10C	
1778	REF	17	LAST	138	F6,1752		DAPTEMP6	EQUALS	DAPTEMP1 +11C	
1779	REF	18	LAST	138	F6,1753		DAPARLPT	EQUALS	DAPTEMP1 +12C	
1780	REF	1			F6,1754		DAPLRLPT	EQUALS	DAPARLPT +1	
1781	REF	2	LAST	138	F6,1755		DAPBGRPT	EQUALS	DAPARLPT +2	
1782	REF	3	LAST	138	F6,1757		DAPZRLPT	EQUALS	DAPARLPT +4	

A1783 (DAPZRLPT IS ALSO JASK-IN-PROGRESS FLAG)
 A1784

R1785 NEEDLER (ATTITUDE ERROR EIGHT BALL DISPLAY) STORAGE. (6C)

1787	REF	3	LAST	95	0061		T5TEMP	EQUALS	ITEMP1	
1788	REF	4	LAST	95	0063		D1NDX	EQUALS	ITEMP3	
1789					F6,1761	F6,1763	AK	ERASE	+2	NEEDLER ATTITUDE INPUTS, SCALED AT 180
1790	REF	1			F6,1762		AK1	EQUALS	AK +1	DEGREES. P,Q,R AXES IN AK, AK1, AK2.
1791	REF	2	LAST	138	F6,1763		AK2	EQUALS	AK +2	
1792					F6,1764	F6,1766	EDRIVEX	ERASE	+2	NEEDLER DISPLAY REGS AT 1800 DEGREES.
1793	REF	1			F6,1765		EDRIVFY	EQUALS	EDRIVFX +1	SO THAT 384 BITS REPRESENT 42 3/16 DEG.
1794	REF	2	LAST	138	F6,1766		EDRIVFZ	EQUALS	EDRIVFX +2	

R1795 CLOCKED JET INHIBITION COUNTERS (3C)

1797					F6,1767	F6,1771	PJETCTR	ERASE	+2	
1798	REF	1			F6,1771		UJETCTR	EQUALS	PJETCTR +1	
1799	REF	2	LAST	138	F6,1771		VJETCTR	EQUALS	PJETCTR +2	
1800	REF	1			F6,1771		END-EE	EQUALS	VJETCTR	

L ERASABLE ASSIGNMENTS

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P1801 FRANK-7 ASSIGNMENTS

1802 E7,1400 SETLOC 3400

R1803 P35 CONSTANTS. -PAD LOADED- (4C)

1805 E7,1400 E7,1401 ATIGINC ERASE +1 B(2)PL *MUST BE AT 1400 FOR SYSTEMSTEST
 1806 E7,1402 E7,1403 PTIGINC ERASE +1 B(2)PL

R1807 AUTMARK STORAGE. -PAD LOADED- (12C)

1809 E7,1404 E7,1411 ACTAZ ERASE +5 B(6)PL
 1810 E7,1412 E7,1417 ACTFL ERASE +5 E(6)PL

R1811 LANDING RADAR. -PAD LOADED- (2D)

1813 E7,1420 E7,1421 LRMAX ERASE E(1)
 1814 E7,1421 E7,1421 LRWH ERASE B(1)
 A1815

R1816 THROTTLE STORAGE. -PAD LOADED- (1C)

1818 E7,1422 E7,1422 ZOOMTIME ERASE B(1)PL TIME OF CPS THROTTLE-UP COMMAND

P1819 P63 AND P64 CONSTANTS. -PAD LOADED- (4C)

1821 E7,1423 E7,1423 TENDBRK ERASE E(1) LANDING PHASE SWITCHING CRITERION
 1822 E7,1424 E7,1424 TENDAPPR ERASE B(1) LANDING PHASE SWITCHING CRITERION
 1823 E7,1425 E7,1425 DELTTFAP ERASE B(1) INCREMENT ADDED TO TTF/E WHEN
 A1824 SWITCHING FROM P63 TO P64
 1825 E7,1426 E7,1426 LEADTIME ERASE B(1) TIME INCREMENT SPECIFYING HOW MUCH
 A1826 GUIDANCE IS PROJECTED FORWARD.
 A1827

R1828 LANDING RADAR -PAD LOADED- (2C)

1830 E7,1427 E7,1427 RPORTIME ERASE B(1) REPOSITIONING CRITERION (TIME)
 1831 E7,1430 E7,1430 RPORTGSw ERASE B(1) REPOSITIONING CRITERION (ANGLE)
 A1832

R1833 ASTERR -PAD LOADED- (2C)

1835 E7,1431 E7,1432 TNEWA ERASE +1 I(2)PL LAMBERT CYCLE PERIOD
 A1836

R1837 P22 STORAGE - OVERLAYS LANDING PADLCAPS - (5C)

L EPASABLE ASSIGNMENTS

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1830	REF	1	E7,1423	REPCSCNT	EQUALS	TEND8PAK	E(1)TMP	CCUNTS NUMBER OF PASSES THROUGH
A1840								REPOSITION ROUTINE.
1841	REF	1	E7,1424	REPOSTM	EQUALS	REPCSCNT +1	I(2)TMP	PRESENT TIME PLUS INCREMENTS OF
A1842								TEN SECONDS.
1843	REF	1	E7,1426	DELTATM	EQUALS	REPOSTM +2	I(2)TMP	TIME INTERVAL FOR RUNNING
A1844								DESIGNATE TASK.
A1845								

R1846 *** RETAIN THE ORDER OF DELVSLV, TIG, RTARG, CELLT4 FOR UPDATE. ***

R1847 P32-35 P72-75 STORAGE. (6C)

1849			E7,1433	E7,144)	DELVLVC	ERASE	+5	I(6) DELTA VELOCITY - LOCAL VERTICAL CCC
1850	REF	1	E7,1433		DELVSLV	=	DELVLVC	(TEMP STORAGE OF SAME VECTOR) -ORINATE
A1851								

R1852 P30-P40 INTERFACE UNSHARED. (2C)

1854			E7,1441	E7,1442	TIG	ERASE	+1	B(2)
A1855								

R1856 INITVEL STORAGE. ALSO USED BY P34,35,74,75,10,11 OTHERS (8C)

1858			E7,1443	E7,1450	RTARG	ERASE	+5	I(6) TARGET VECTOR
1859			E7,1451	E7,1452	CELLT4	ERASE	+1	I(2) TIME DIFFERENCE
A1860								

R1861 P3J-P40 INTERFACE UNSHARED. (3C)

1863			E7,1453	E7,1454	TTCGC	ERASE	+1	B(2)
1864	REF	1	E7,1453		TF1	EQUALS	TTCGC	
1865			E7,1455	E7,1455	WHICH	ERASE		B(1)
A1866								

R1867 *** R21 *** (1C)

1869			E7,1456	E7,1456	LOSCCUNT	ERASE		B(1)
A1870								

R1871 LSR22.3 (RENDFZVCUS NAVIGATION) STORAGE. (4C)

R1872 RETAIN THE ORDER OF AIG TO TRKMKCNT FOR DOWNLINK PURPOSES.

1874			E7,1457	E7,1457	AIG	ERASE	E(1)CLT	GYMICAL ANGLES
1875			E7,1460	E7,1460	AMC	ERASE	B(1)CLT	(PLST RE
1876			E7,1461	E7,1461	ACC	ERASE	B(1)OUT	CONSECUTIVE)

1877			E7,1462	E7,1462	TRKMKCNT	ERASE	B(1)TMP	TEMPORARY MARK STORAGE.
1878	REF	1	E7,1462		MARKCTR	=	TRKMKCNT	

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P1879 P32-P35, P72-P75 STORAGE. -PERMANENT-

(6)

1881		E7,1463	E7,1463	NORMEX	ERASE		B(1) PRM SAVE FOR Q
1882		E7,1464	E7,1464	QSAVED	ERASE		B(1) PRM SAVE FOR Q
1883		E7,1465	E7,1465	PTRN	ERASE		B(1) PRM SAVE FOR Q
1884		E7,1466	E7,1467	NN	ERASE	+1	B(2)
1885		E7,1470	E7,1470	SUBEXIT	ERASE		B(1) PRM SAVE G

1886		E7,1471		E7OVERLA	EQUALS		START OF E7 OVERLAYS.
1887	REF 1	E7,1471		WFOCARES	EQUALS E7OVERLA		DUMMY FOR EBANK INSENSITIVE 2CADRS

P1888 LUNAR LANDING OVERLAYS

(6C)

1890	REF 1	E7,1463	/AFC/	EQUALS NORMEX		B(2)TMP	THRATTLE
1891	REF 1	E7,1465	FCDD	EQUALS /AFC/	+2	B(2)TMP	THRATTLE
1892	REF 1	E7,1467	FP	EQUALS FCDD	+2	B(2)TMP	THRATTLE

A1893

P1894 ERASABLES FOR P64: OVERLAY OF RTARG

(4C)

1896	REF 1	E7,1443	ZERLINA	EQUALS RTARG		B(1)	P64
1897	REF 1	E7,1444	ELVIRA	EQUALS ZERLINA	+1	B(1)	P64
1898	REF 1	E7,1445	AZINCRI	EQUALS ELVIRA	+1	B(1)	P64
1899	REF 1	E7,1446	ELINCRI	EQUALS AZINCRI	+1	B(1)	P64

A1900

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P1901 ***** OVERFLAY NUMBER C IN FRANK 7 *****
 A1902

R1902 RENDEZVOUS GLIDANCE STORAGE -F32....P35-

(890)

1905	REF	1		F7,1611	TSTRT	EQUALS DELDV	MIDCOURSE START TIME
1906	REF	1		F7,1573	TDEC2	EQUALS DELVCSI	TEMP STORAGE FOR INTEGRATION TIME INPUT
1907	REF	1		F7,1575	KT	EQUALS DELVTPI	TEMP STORAGE FOR MIDCOURSE DELTA TIME
1908				F7,1471	F7,1475	VACT1	ERASE +50
1909				F7,1477	F7,1504	RPASS1	ERASE +50
1910				F7,1515	F7,1512	VPASS1	ERASE +50
1911				F7,1513	F7,1520	VACT2	ERASE +50
1912				F7,1521	F7,1526	RPASS2	ERASE +50
1913				F7,1527	F7,1534	VPASS2	ERASE +50
1914				F7,1535	F7,1542	RACT3	ERASE +50
1915				F7,1543	F7,1550	VACT3	ERASE +50
1916				F7,1551	F7,1556	RPASS3	ERASE +50
1917				F7,1557	F7,1564	VPASS3	ERASE +50
1918				F7,1565	F7,1572	VACT4	ERASE +50
1919	REF	1		F7,1543		UNVEC	EQUALS VACT3
1920				F7,1573	F7,1574	DELVCSI	ERASE +10
1921				F7,1575	F7,1576	DELVTPI	ERASE +10
1922	REF	2	LAST 142	F7,1575		DELVMID	EQUALS DELVTPI
1923				F7,1577	F7,1600	DIFFALT	ERASE +10
1924				F7,1611	F7,1602	POSTCSI	ERASE +1
1925				F7,1613	F7,1604	PCSTCH	ERASE +1
1926				F7,1615	F7,1606	PCSTTPI	ERASE +1
1927	REF	1		F7,1615		LCOPCT	EQUALS PCSTTPI
1928	REF	1		F7,1613		HAEPAL	EQUALS PCSTCH
1929				F7,1617	F7,1610	GAMPREV	ERASE +1
1930	REF	3	LAST 142	F7,1575		CMPREV	EQUALS DELVTPI
1931				F7,1611	F7,1612	DELDV	ERASE +10
1932				F7,1613	F7,1614	CSIALRM	ERASE +1
1933				F7,1615	F7,1615	VERBACUN	ERASE
1934	REF	1		F7,1613		TITER	EQUALS CSIALRM
1935				F7,1616	F7,1617	RECTV	ERASE +1
1936	REF	1		F7,1505		VAPREC	EQUALS VPASS1
1937	REF	1		F7,1477		RAPREC	EQUALS RPASS1
1938	REF	1		F7,1527		VPPREC	EQUALS VPASS2
1939	REF	1		F7,1521		RPPREC	EQUALS RPASS2
1940	REF	4	LAST 142	F7,1575		DFLEL	EQUALS DELVTPI
1941	REF	2	LAST 142	F7,1611		DELTFE	EQUALS DELDV
1942	REF	2	LAST 142	F7,1573		SFCMAX	EQUALS DELVCSI
1943	REF	2	LAST 142	F7,1615		DELTFEED	EQUALS POSTTPI
1944				F7,1620	F7,1621	CENTANG	ERASE +1

A1945

L ERASABLE ASSIGNMENTS

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R1946 SOME P47 STORAGE

(6C)

1948 E7,1622 E7,1627 DELVIML ERASE +5 I(6)DSP ACUN #3 FOR P47 DELTA V (IML)
 A1949

R1950 P30-P40 COMMON STORAGE.

(3C)

1952 E7,1630 E7,1631 TPASS4 ERASE +1 INTERCEPT TIME
 1953 E7,1632 E7,1632 QTEMP EPASE I(1)TMP COMMON RETURN SAVE REGISTER.

A1954

R1955 P32,33,34 STORAGE.

(6C)

1957 E7,1633 E7,1634 TCSI EPASE +1 E(2) TMP CSI TIME IN CENTISECONDS
 1958 E7,1635 E7,1636 TTPI ERASE +1 E(2) TMP TPI TIME IN CENTISECONDS
 1959 E7,1637 E7,1640 TTPI() ERASE +1 E(2) TMP TTPI STORAGE FOR RECYCLE

P1960 P30,P40 INTERFACE.

(21C)

1962 E7,1641 E7,1664 RTIG ERASE +19D I(6)TMP
 1963 REF 1 E7,1647 VTIG EQUALS RTIG +6 I(6)TMP
 1964 REF 1 E7,1655 DELVSIN EQUALS VTIG +6 I(6)TMP
 1965 REF 1 E7,1653 DELVSAR EQUALS DELVSIN +6 I(2)TMP
 1966 REF 1 E7,1663 VGDISP = DELVSAR

1967 E7,1665 E7,1665 QTEMP1 FRASE I(1)TMP HOLDS RETURN.
 1968 REF 1 E7,1665 RGFXIT EQUALS QTEMP1 SAVE G
 1969 REF 2 LAST 143 E7,1665 SAVQR52 EQUALS QTEMP1

R1970 INITVEL STORAGE. (IN OVERLAY 0 AND OVERLAY 1.
 P1972 (CALLS LAMBERT, CONIC SUBROUTINES)

(2C)

1973 REF 1 E7,1565 VTPRIME EQUALS VACT4 TOTAL VELOCITY AT DESIRED RADIUS
 1974 REF 1 E7,1616 ITCTR EQUALS RECTV ITERATION COUNTER
 1975 E7,1666 E7,1667 COZY4 FRASE +1 CCS OF ANGLE WHEN ROTATION STARTS
 1976 REF 3 LAST 142 E7,1611 XIINPUT EQUALS DELDV XI TEMP STORAGE
 1977 REF 1 E7,1607 INTIME EQUALS GAMPREV TIME OF RINIT
 A1978

R1979 PERIAPC STORAGE. (2C)

(2C)

1981 E7,1670 E7,1671 XXXALT ERASE +1 RADIUS TO LAUNCH PAD OR LANDING SIGHT
 1982 REF 1 E7,1672 END-IN/M EQUALS XXXALT +2 NEXT AVAIL ERASABLE AFTER INITVEL/MIDGIM

L ERASABLE ASSIGNMENTS

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R1983 S40.1 STORAGE.

(12C)

1985			E7,1672	E7,1705	UT	ERASE	+11D	I(6)	THRUST DIRECTION
1986	REF	1	E7,1700		VG TIC	EQUALS UT	+6	I(6)	CUT
1987	REF	1	E7,1700		VG PREV	= VG TIC			

R1988 ASTEEP STORAGE.

(22D)

1990			E7,1706	E7,1733	VG	ERASE	+21D	I(6)	
1991	REF	1	E7,1714		RMAG	EQUALS VG	+6	I(2)	
1992	REF	1	E7,1716		MUASTEER	EQUALS RMAG	+2	I(2)	
1993	REF	1	E7,1720		ML/A	EQUALS ML/A	+2	I(2)	
1994	REF	1	E7,1722		RTMAG	EQUALS ML/A	+2	I(2)	
1995	REF	1	E7,1724		RIC	EQUALS RTMAG	+2	I(6)	
1996	REF	1	E7,1732		SS	EQUALS RIC	+6	I(2)	

1997	REF	2	LAST 143	E7,1655	IC	=	DELVSIN		
1998	REF	1		E7,1762	TIGSAVE	=	P21TIME		
1999	REF	1		E7,1764	TIGSAVEP	=	SCAXIS		
2000	REF	2	LAST 144	E7,1766	MUSCALF	=	SCAXIS	+2	

P2001

R2002 F40 STORAGE.

(6C)

R2004 F,MDCT,AND TDECAY MUST BE CONTIGUOUS FOR VLOCAD.

2005			E7,1734	E7,1741	F	ERASE	+5	I(2)	TMP S40.1 GENERATES THIS FOR S40.3
2006	REF	1	E7,1736		MDCT	EQUALS F	+2	I(2)	TMP MASS CHNG RATE, KG/CS AT 2**3.
2007	REF	1	E7,1740		TDECAY	EQUALS MDCT	+2	I(2)	IN DELTA-T TAILOFF, (2**2E)CS.
2008			E7,1742	E7,1743	VFX	ERASE	+1	I(2)	EXHAUST VELOCITY FOR TGC COMPUTATION

A2009

P2010 MICTCAV1(2) STORAGE. (CALLED BY F40,F41,F42)

(1C)

2012			E7,1744	E7,1744	1RETURN1	ERASE		B(1)	RETURN FROM MICTCAV1 AND 2
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A2013

L ERASABLE ASSIGNMENTS

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E) S4

P2014 ***** OVERLAY NUMBER 1 IN EEANK 7 *****
 A2015

P2016 INITVEL (CALLED BY P34,35,38,39,10,11,S40.9,S40.1) (6D)

2018 REF 1 F7,1471 RTARG1 EQUALS VACT1 I(6)S TEMP STORAGE OF RTARG
 A2019

P2020 P35-P40 INTERFACE. (6C)

2022 REF 2 LAST 142 E7,1505 VPASS4 EQUALS VPASS1 I(6)TMP VELOCITY OF PASSIVE AT INTERCEPT

P2023 LAT - LONG TEMPORARIES. CAN OVERLAY WITH S40.1 (3D)

2025 REF 2 LAST 144 F7,1672 ERADM EQUALS UT I(2)
 2026 REF 1 F7,1674 INCORPEX EQUALS ERADM +2 I(1)

R2027 LRS24.1 STORAGE. (CAN SHARE WITH P30'S) (40D)

2029 REF 1 F7,1675 RLMSRCH EQUALS INCCRFEX +1 I(6) TMP LM POSITION VECTOR
 2030 REF 1 F7,1703 VXRCM EQUALS RLMSRCH +6 I(6) CM V X R VECTOR
 2031 REF 1 F7,1711 LCSDSRD EQUALS VXRCM +6 I(6) DESIRED LCS VECTOR
 2032 REF 1 F7,1717 UXVECT EQUALS LCSDSRD +6 I(6) X-AXIS SRCH PATTERN COORDS
 2033 REF 1 F7,1725 UYVECT EQUALS UXVECT +6 I(6) Y-AXIS SPCH PATTERN COORDS
 2034 REF 1 F7,1733 DATAGCCD EQUALS UYVECT +6 B(1)ESP FOR R1 - ALL 1-S WHEN LOCKON
 2035 REF 1 F7,1734 CMEGDISP EQUALS DATAGCCD +1 B(2) ANGLE CMEGA DISPLAYED IN R2
 2036 REF 1 F7,1734 CMEGAC = CMEGDISP PINBALL DEFINITION.
 2027 REF 2 LAST 145 F7,1736 NSRCHPNT EQUALS CMEGDISP +2 B(1)TMP SEARCH PATTERN PCINT COUNTER.
 2038 REF 1 F7,1737 SAVLEMV EQUALS NSRCHPNT +1 I(6) S-S SAVES LCSVEL

A2039

L FRASAELE ASSIGNMENTS

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P2040 ***** OVERLAY NUMBER 2 IN FEAK 7 *****
 A2041

P2042 INCOMP STORAGE IN E7. (479)

2044	REF	2	LAST 141	E7,1471	TX789	EQUALS F7OVERLA	I(6)
2045	REF	1		E7,1477	GAMMA	EQUALS TX789 +6	I(2)
2046	REF	1		E7,1502	OMEGA	EQUALS GAMMA +3	I(18)
2047	REF	1		E7,1524	BVECTOR	EQUALS OMEGA +180	I(18)
2048	REF	1		E7,1546	DELTAQ	EQUALS BVECTOR +180	I(2)
R2049			AOTMARK STORAGE				(30)
2051	REF	1		E7,1550	MARKCNTR	EQUALS DELTAQ +2	I(1)
2052	REF	1		E7,1551	XYMARK	EQUALS MARKCNTR +1	R(1)
2053	REF	1		E7,1552	MKDEX	EQUALS XYMARK +1	E(1) TMP INDEX FOR AOTMARK
A2054							

R2055 PLANET STORAGE. (80)

2057	REF	1		E7,1553	PLANVEC	EQUALS MKDEX +1	(6) REFER VECTOR OF PLANET
2058	REF	1		E7,1561	TSIGHT	EQUALS PLANVEC +6	(2) TIME OF MARK OR EST TIME OF MARK
A2059							

R206 PLANET2.3 STORAGE. (CAN SHARE WITH P30'S AND OVERLAY LRS24.1 (300).

2062	REF	2	LAST 145	E7,1675	LGRET	EQUALS RLMSRCH	I(1) TMP
2063	REF	1		E7,1675	RCRET	EQUALS LGRET	R(1) TEMP RETURN.
2064	REF	2	LAST 146	E7,1675	JCRET	EQUALS LGRET	E(1) TEMP RETURN.
2065	REF	1		E7,1676	MX	EQUALS RCRET +1	I(6)
2066	REF	1		E7,1704	MY	EQUALS MX +6	I(6)
2067	REF	1		E7,1712	MZ	EQUALS MY +6	I(6)
2068	REF	2	LAST 146	E7,1676	E0	EQUALS MX	I(2)
2069	REF	3	LAST 146	E7,1700	E1	EQUALS MX +2	I(2)
2070	REF	4	LAST 146	E7,1702	E2	EQUALS MX +4	I(2)
2071	REF	1		E7,1704	E3	EQUALS E2 +2	I(2)
2072	REF	1		E7,1720	SCALSHFT	EQUALS MZ +6	R(1) SCALE SHIFT FOR EARTH/MOON
2073	REF	1		E7,1721	RXZ	EQUALS SCALSHFT +1	I(2)
2074	REF	1		E7,1722	ULC	EQUALS RXZ +2	I(6)
2075	REF	1		E7,1731	SINTHETA	EQUALS ULC +6	I(2)

R2076 ***** IN OVERLAY CNF *****

2077	REF	1		E7,1746	N49FLAG	EQUALS RDCITSAV	R(1)S FLAG INDICATING V0649 RESPONSE
A2078							

R2079 LRS22.1 STORAGE. (MUST NOT SHARE WITH P30'S) (130)

R2081 (OUTPUTS ARE TO LRS22.3)

L ERASABLE ASSIGNMENTS

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2082	REF	1		F7,1732	RPTRLN	EQUALS	SINTHETA	+2	E(2)OUT	RR TRUNION ANGLE
2083	REF	1		F7,1735	RRSHAFT	EQUALS	RRTRLN	+2	B(2)CLT	RRSHAFT ANGLE
2084	REF	1		F7,1737	LRS22.1X	EQUALS	RRSHAFT	+2	B(1)TMP	
2085	REF	1		F7,1740	RRBORSIT	EQUALS	LRS22.1X	+1	I(6) TME	PACAR ECRESIGHT VECTOR.
2086	REF	1		F7,1746	RCOTMSAV	EQUALS	RRBORSIT	+6	B(2) S	RR RANGE-RATE (FPS)

A2087

R2088 LRS22.1 (SAME AS PREVIOUS SECTION) ALSO DOWNLINK FOR RR (R29)(10D) CANNOT SHAPE WITH L.A.C.

2090	REF	2	LAST 146	F7,1750	RCOTM	EQUALS	RCOTMSAV	+2	B(2)OUT	RANGE-RATE READING
2091	REF	1		F7,1752	TANGNE	EQUALS	RCOTM	+2	B(2)TME	RR CINEAL ANGLES
R2092			RETAIN THE ORDER OF MKTIME TO RM FOR DOWNLINK PURPOSES							
2093	REF	1		F7,1754	MKTIME	EQUALS	TANGNE	+2	B(2)OUT	TIME OF RP READING
2094	REF	1		F7,1756	RM	EQUALS	MKTIME	+2	I(2)CLT	RANGE READING
2095	REF	1		F7,1760	RANGROOT	EQUALS	RM	+2	B(2)	DOWNLINKED RAW RANGE AND RRATE

A2096

R2097 F61LEM - PREFERRED TRACKING ATTITUDE ROUTINE **IN OVERLAY ONE*

R2098 (CALLED BY P20, R22LEM, LSR22.3) (1D)

2100	REF	2	LAST 147	F7,1745	R65CNTR	EQUALS	RRBORSIT	+5	B(1)SS	COUNT NUMBER OF TIMES PREFERRED TRACKING ROUTINE IS TC CYCLE
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A2101

A2102

R2104 P21 STORAGE (2D)

2106	REF	1		F7,1762	P21TIME	EQUALS	RANGROOT	+2	I(2)TMP
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A2107

R2108 KALCMANU, VECPOINT STORAGE. CALLED BY R63, R61, R65. (12D)

2110	REF	2	LAST 144	F7,1764	SCAXIS	EQUALS	P21TIME	+2	I(6)
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2111	REF	2	LAST 144	F7,1772	PCINTVSM	EQUALS	SCAXIS	+6	I(6)
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A2112

L ERASABLE ASSIGNMENTS

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P2113 ***** OVERLAY NUMBER 3 IN ERANK 7 *****
A2114

R2115 SERVICEP STORAGE (6C)

2117	REF	3	LAST	146	E7,1471	AEVEL	EQUALS	E7OVERLA	B(2)	DISPLAY
2118	REF	1			E7,1473	HCOCTDISP	EQUALS	AEVEL +2	E(2)	DISPLAY
2119	REF	2	LAST	120	E7,1475	TTFDISP	EQUALS	HCOCTDISP +2	E(2)	DISPLAY

A2120

R2121 BURN PROG STORAGE. (2C)

2123	REF	1			E7,1477	SAVET-30	EQUALS	TTFDISP +2	B(2)TMP	TIG-30 RESTART
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A2124

R2125 SERVICEP STORAGE. (65C)

2127	REF	1			E7,1501	VGBCDY	EQUALS	SAVET-30 +2	B(6)OUT	SFT.PY S41.1 VG LEM, SC.CCOPDS
2128	REF	1			E7,1501	DELVCTL	=	VGBCDY		
2129	REF	2	LAST	148	E7,1507	DVTOTAL	EQUALS	VGBCDY +6	B(2)	DISPLAY ACUN
2130	REF	1			E7,1511	GCBLTIME	EQUALS	DVTOTAL +2	B(2)	NOMINAL TIG FOR CALC. CF GCBLATE.
2131	REF	1			E7,1513	ABDVCCNV	EQUALS	GCBLTIME +2	I(2)	
2132	REF	1			E7,1515	DVCNTR	EQUALS	ABDVCCNV +2	B(1)	
2133	REF	1			E7,1516	TGC	EQUALS	DVCNTR +1	B(2)	
2134	REF	1			E7,1520	R	EQUALS	TGC +2	I(6)	
2135	REF	1			E7,1520	UNITCCBL	EQUALS	R	I(6)	
2136	REF	2	LAST	148	E7,1526	V	EQUALS	R +6		
2137	REF	1			E7,1526	DELVREF	EQUALS	V	I(6)	
2138	REF	1			E7,1534	H/CALC	EQUALS	DELVREF +6	B(2)	LR
2139	REF	1			E7,1536	UNIT/R/	EQUALS	H/CALC +2	I(6)	

R2140 (THE FOLLOWING SERVICEP ERASABLES CAN BE SHARED WITH SECCND DPS (GUIDANCE STORAGE)

2142	REF	1			E7,1544	PN1	EQUALS	UNIT/R/ +6	B(6)	
2143	REF	1			E7,1552	VN1	EQUALS	PN1 +6	I(6)	(IN ORDER)
2144	REF	1			E7,1560	PIPTIME1	EQUALS	VN1 +6	B(2)	(FOR)
2145	REF	1			E7,1562	GDT1/2	EQUALS	PIPTIME1 +2	I(6)	(COPY)
2146	REF	1			E7,1570	MASS1	EQUALS	GDT1/2 +6	I(2)	(CYCLE)
2147	REF	1			E7,1572	RIS	EQUALS	MASS1 +2	I(6)	
2148	REF	1			E7,1600	VIS	EQUALS	RIS +6	I(6)	

R2149 ALIGNMENT/S40.2.3 COMMON STORAGE. (18C)

2151	REF	1			E7,1606	XSMO	EQUALS	VIS +6	I(6)	
2152	REF	1			E7,1614	YSMO	EQUALS	XSMO +6	I(6)	
2153	REF	1			E7,1622	ZSMO	EQUALS	YSMO +6	I(6)	

2154	REF	2	LAST	148	E7,1606	XSCREF	=	XSMO		
2155	REF	2	LAST	148	E7,1614	YSCREF	=	YSMO		

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2156 REF 1 E7,1622 ZSCREF = ZSMD

2157 REF 2 LAST 149 E7,1630 END-ALIG EQUALS ZSMD +6 NEXT AVAIL ERASABLE AFTER ALIGN/S40.2,3

R2158 ***** P22 ***** (24D)

2160 REF 1 E7,1630 RSUBL EQUALS END-ALIG I(6)S-S LM POSITION VECTOR

2161 REF 1 E7,1636 UCSM EQUALS RSUBL +6 I(6)S-S VECTOR L

2162 REF 1 E7,1644 NEWVEL EQUALS UCSM +6 I(6)S-S TERMINAL VELOCITY VECTOR

2163 REF 1 E7,1652 NEWPOS EQUALS NEWVEL +6 I(6)S-S TERMINAL POSITION VECTOR

2164 REF 1 E7,1660 LCHTM EQUALS NEWPOS +6 I(2)S-S EST. LAUNCH TIME FOR LEM

2165 REF 1 E7,1662 TRANSTM EQUALS LCHTM +2 I(2)S-S TRANSFER TIME

2166 REF 1 E7,1664 NCSMVFL EQUALS TRANSTM +2 I(6)S-S NEW CSM VELOCITY

A2167

R2168 ***** P21 ***** (18D)

2170 REF 1 1162 P21ORIG = DISPDIX

2171 REF 3 LAST 146 E7,1675 P21BASER EQUALS RLMSRCH I(6)TMP

2172 REF 1 E7,1703 P21BASEV EQUALS P21BASER +6 I(6)TMP

2173 REF 1 E7,1711 P21VEL EQUALS P21BASEV +6 I(2)TMP *** NOUN 91 ***

2174 REF 1 E7,1713 P21GAM EQUALS P21VEL +2 I(2)TMP *** NOUN 91 ***

2175 REF 1 E7,1715 P21ALT EQUALS P21GAM +2 I(2)TMP *** NOUN 91 ***

A2176

L ERASABLE ASSIGNMENTS

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P2177 ***** OVERLAY NUMBER 4 IN EBANK 7 *****
A2178

R2179 VARIABLES FOR SECOND OPS GUIDANCE (THE LUNAR LANDING) (800)

R2181 THESE ERASABLES MAY BE SHARED WITH CORE

2182	REF	2	LAST 148	E7,1544	OURTEMPS =	RN1	OVERLAY LAST PART OF SERVICE
2183	REF	1		E7,1544	LANDTEMP =	CURTEMPS	B(6) GUIDANCE
2184	REF	1		E7,1552	TTF/ETMP =	LANDTEMP +6	B(2) GUIDANCE
2185	REF	1		E7,1554	ELINCR =	TTF/ETMP +2	B(2) GUIDANCE
2186	REF	1		E7,1556	AZINCR =	ELINCR +2	B(2) GUIDANCE
2187	REF	1		E7,1560	KEEP-2 =	AZINCR +2	B(2) TC PREVENT PIPTIME1 OVERLAY
2188	REF	1		E7,1562	TABLTTF =	KEEP-2 +2	B(2) GUIDANCE
2189	REF	1		E7,1573	TPICOLD =	TABLTTF +9C	B(2) GUIDANCE
2190	REF	1		E7,1621	F2DPS	EQUALS OURPERMS	

R2191

R2192 THESE ERASABLES MUST NOT OVERLAY GOBLTIME OR SERVICE

2193	REF	3	LAST 148	E7,1616	PIFSET =	XSMD	B(1) THRCTTLE
2194	REF	1		E7,1617	RTHCLD =	PIFSET +1	B(1) THRCTTLE
2195	REF	1		E7,1610	FWEIGHT =	RTHCLD +1	B(2) THRCTTLE
2196	REF	1		E7,1612	PIF =	FWEIGHT +2	B(2) THRCTTLE
2197	REF	1		E7,1614	PSEUDOC55 =	PIF +2	B(1) THRCTTLE DOWNLINK
2198	REF	1		E7,1615	FC =	PSEUDOC55 +1	B(2) THRCTTLE
2199	REF	1		E7,1617	TTHRCT =	FC +2	B(1) THRCTTLE
2200	REF	1		E7,1620	FCCLD =	TTHRCT +1	B(1) THRCTTLE

A2201

R2202 THESE ERASABLES SHOULD NOT BE SHARED DURING F63, F64, F65, P66, P67

2203	REF	1		E7,1621	OURPERMS =	FCCLD +1	MUST NOT OVERLAY CURTEMPS OR SERVICE
2204	REF	2	LAST 150	E7,1621	WCHPCLD =	CURPERMS	B(1) GUIDANCE
2205	REF	1		E7,1622	FILLER =	WCHPCLD +1	
2206	REF	1		E7,1623	FLPASSO =	FILLER +1	B(1) GUIDANCE
2207	REF	1		E7,1624	TPIP =	FLPASSO +1	B(2)
2208	REF	1		E7,1626	VGU =	TPIP +2	B(6) GUIDANCE
2209	REF	1		E7,1634	LAND =	VGU +6	B(6) GUIDANCE CONTIGUOUS
2210	REF	1		E7,1642	TTF/8 =	LAND +6	B(2) GUIDANCE CONTIGUOUS
2211	REF	1		E7,1644	ELIDUMMY =	TTF/8 +2	(1) DUMMY FOR ELINCR1
2212	REF	1		E7,1545	AZIDUMMY =	ELIDUMMY +1	(1) DUMMY FOR AZINCR1
2213	REF	1		E7,1646	ZERDUMMY =	AZIDUMMY +1	(1) DUMMY FOR ZERLINA
2214	REF	1		E7,1647	ELVDUMMY =	ZERDUMMY +1	(1) DUMMY FOR ELVIRA
2215	REF	1		E7,1650	LRADRET =	ELVDUMMY +1	B(1) LR
2216	REF	1		E7,1651	VSELECT =	LRADRET +1	B(1) LR
2217	REF	1		E7,1652	VMEAS =	VSELECT +1	B(2) LR
2218	REF	1		E7,1654	HMEAS =	VMEAS +2	B(2) LR
2219	REF	1		E7,1656	VN2 =	HMEAS +2	B(6) LR

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2221	REF	1		F7,1656	GNLR	=	VA2	E(6)	LR
2221	REF	2	LAST	151	GNUV	=	VA2	B(6)	LR
2222	REF	3	LAST	151	LRADRET1	=	VA2	B(1)	LR
2223	REF	4	LAST	151	DELTAH	=	VA2 +6	E(2)	DISPLAY
2224	REF	1		F7,1666	FUNNYDSP	=	DELTAH +2	B(2)	DISPLAY
2225	REF	1		F7,1670	ECURPERM	EQUALS	FUNNYDSP +2	NEXT AVAILABLE ERASABLE AFTER OURPERMS	

R2226

R2227 (ERASABLES WHICH OVERLAY THE ABOVE BLOCK)

2228	REF	2	LAST	150	F7,1644	VDGVERT	=	ELTDUMMY	E(2)	F65, P66
2229	REF	2	LAST	150	F7,1646	NIGNLOOP	=	ZERDLMMY	E(1)	IGNALG
2230	REF	2	LAST	150	F7,1647	AGUIDSUE	=	FLVDUMMY	E(1)	IGNALG
2231	REF	3	LAST	151	F7,1647	WCHVERT	=	FLVDLMMY	E(1)	F65, F66, P67
2232	REF	2	LAST	151	F7,1666	FUELNEED	=	FUNNYDSP	B(1)	DISPLAY
2233	REF	3	LAST	151	F7,1666	TRFDES	=	FUNNYDSP	B(1)	DISPLAY
2234	REF	4	LAST	151	F7,1667	LOOKANGL	=	FLNNYDSP +1	B(1)	DISPLAY

A2235

R2236 ERASABLES CONVENIENTLY DEFINABLE IN THE WORK AREA

2237				0022	PROJ	=	180	I(2)	GUIDANCE
2238				0024	UNLRB/2	=	200	I(6)	GUIDANCE (DURING P64 ONLY)
2239				0024	UNLR/2	=	200	I(6)	GUIDANCE

R2240

R2241 THE END OF THE LUNAR LANDING ERASABLES

A2242

R2243 R12 (FOR LUNAR LANDING)

(6C)

2245	REF	1		F7,1670	LPLCTR	EQUALS	ECURPERM	B(1)	LR DATA TEST
2246	REF	1		F7,1671	LPRCTR	EQUALS	LRLCTR +1	B(1)	
2247	REF	1		F7,1672	LRMCTR	EQUALS	LPRCTR +1	B(1)	
2248	REF	1		F7,1673	LRSCPT	EQUALS	LRMCTR +1	B(1)	
2249	REF	1		F7,1674	STILEACH	EQUALS	LRSCPT +1	B(1)	
2250	REF	1		F7,1675	STILPADV	EQUALS	STILEACH +1	B(1)	

A2251

R2252 LANDING ANALOGS DISPLAY STORAGE.

(4CD)

2254	REF	1		F7,1676	LATVMETP	EQUALS	STILPADV +1	B(1)PRM	LATVEL MONITOR METER (AN ORDER)
2255	REF	1		F7,1677	FORVMETR	EQUALS	LATVMETR +1	B(1)PRM	FORVEL MONITOR METER (-EC PAIR)
2256	REF	1		F7,1700	LATVEL	EQUALS	FORVMETR +1	B(1)PRM	LATERAL VELOCITY (AN ORDER)
2257	REF	1		F7,1701	FORVEL	EQUALS	LATVEL +1	B(1)PRM	FORWARD VELOCITY (-EC PAIR)
2258	REF	1		F7,1702	TRAKLATV	EQUALS	FORVEL +1	B(1)PRM	MONITOR FLG 4 LATVEL (AN ORDER)
2259	REF	1		F7,1703	TRAKFWDV	EQUALS	TRAKLATV +1	B(1)PRM	MONIT. FLAG FOR FORVEL (EC PAIR)
2260	REF	1		F7,1704	VHY	EQUALS	TRAKFWDV +1	B(1)PRM	VHY=VMP, UHYP (AN ORDER)

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FC §4

2261	RFF	1		F7,1715	VHZ	EQUALS	VHZ	+1	B(1)PRM VHZ=VMP.UFZP (-ED PAIR)
2262	RFF	1		F7,1716	VVECT	EQUALS	VHZ	+1	B(3)PRM UPDATED S.P. VELOCITY VECTOR
2263	RFF	1		F7,1711	ALTRATE	EQUALS	VVECT	+2	B(1)PRM ALTITUDE RATE IN BIT UNITS
2264	RFF	1		F7,1712	ALTSAVE	EQUALS	ALTRATE	+1	B(2)PRM ALTITUDE IN BIT UNITS
2265	RFF	1		F7,1714	LACQSAVE	EQUALS	ALTSAVE	+2	B(1)PRM SAVE G IN LANDISP
2266	RFF	1		F7,1715	DT	EQUALS	LACQSAVE	+1	B(1)PRM TIME I MINUS (PIPTIME +1)
2267	RFF	1		F7,1716	DALTRATE	EQUALS	DT	+1	B(1)PRM ALTITUDE RATE ERROR CORRECTION
2268	RFF	1		F7,1717	UHYP	EQUALS	DALTRATE	+1	B(6)PRM SM UNIT VECTOR
2269	RFF	1		F7,1717	QAXIS	=	UHYP		
2270	RFF	2	LAST 152	F7,1725	UFZP	EQUALS	UHYP	+6	B(6)PRM SM UNIT VECTOR
2271	RFF	2	LAST 120	F7,1733	DELVS	EQUALS	UFZP	+6	B(6)PRM DELVS = WXP
2272	RFF	1		F7,1741	ALTBITS	EQUALS	DELVS	+6	B(2)PRM ALTITUDE IN BIT UNITS, 2.34FT/BT
2273	RFF	1		F7,1743	RUNIT	EQUALS	ALTBITS	+2	B(3)PRM SM HALF-UNIT R VECTOR
2274	RFF	1		F7,1745	LASTLADW	EQUALS	RUNIT	+2	ONLY A TAG TO SIGNIFY LAST L.A.D. WORD

R2276 P66 FRASABLES (F.C.C.)

(1 D)

2278	REF	2	LAST	152	F7,1746	PODCCLNT EQUALS RLNT	+3
A2279							

R2286 P66 ERASABLES (P.C.C.)

(14C)

2282	REF	2	LAST	147	E7,1756	RCDSCALI	EQUALS	RM	B(1)
2283	REF	1			E7,1757	LASTTPIP	EQUALS	RCDSCALI +1	I(2)
2284	REF	1			E7,1761	THISTPIF	EQUALS	LASTTPIP +2	E(2)
2285	REF	1			E7,1763	QLODIPAX	EQUALS	THISTPIP +2	B(1)
2286	REF	1			E7,1764	QLODIPAY	EQUALS	QLODIPAX +1	B(1)
2287	REF	1			E7,1765	QLODIPAZ	EQUALS	QLODIPAY +1	P(1)
2288	REF	1			E7,1766	DELVRDD	EQUALS	QLODIPAZ +1	E(6)
A2289									

R229'1 NCUN 63 COMPONENT

(25)

2252	RFF	1	57,1774	FCALC1	EQUALS DELVRED	+6	I(2)
A2253							

L ERASABLE ASSIGNMENTS

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P2294 ***** OVERLAY NUMBER 5 IN EEANK 7 *****
 A2295

R2296 ASCENT GUIDANCE ERASABLES.

(21D)

2298	REF	2	LAST 149	E7,1630	RCD	EQUALS	END-ALIG	I(2)TMP	TARGET RADIUS AND CLT-CF-PLANE
2299	REF	1		E7,1632	YCD	EQUALS	RCD +2	I(2)TMP	DISTANCE, SCALED AT 2(24).
2300	REF	1		E7,1634	1/EV1	EQUALS	YCD +2	B(2)TMP	ATMAG
2301	REF	1		E7,1636	1/DV2	EQUALS	1/DV1 +2	B(2)TMP	ATMAG
2302	REF	1		E7,1640	1/DV3	EQUALS	1/DV2 +2	B(2)TMP	ATMAG
2303	REF	1		E7,1642	XRANGE	EQUALS	1/EV3 +2	B(2)TMP	
2304	REF	1		E7,1644	ENGDOFFDT	EQUALS	XRANGE +2	B(1)TMP	
2305	REF	1		E7,1645	VGVECT	EQUALS	ENGDOFFDT +1	I(6)OUT	VELOCITY-TO-BE-GAINED
2306	REF	1		E7,1653	TXC	EQUALS	VGVECT +6	I(2)TMP	TIME AT WHICH X-AXIS OVERRIDE IS ALLOWED.

A2307

R2308 END OF THE ASCENT GUIDANCE ERASABLES.

R2309 THE FOLLOWING CARDS KEEP THE ASSEMBLER HAPPY UNTIL THE SYMBOLS ARE DELETED FROM THE PINBALL NCUN TABLES.

2311	REF	1		E7,1745	END-E7.0	EQUALS	IRETURN1 +1	FIRST UNUSED LOCATION IN E7 OVERLAY 0
2312	REF	1		E7,1747	END-E7.1	EQUALS	N49FLAG +1	FIRST UNUSED LOCATION IN E7 OVERLAY 1
2313	REF	1		4407	END-E7.2	EQUALS	PCINTVSM +6	FIRST UNUSED LOCATION IN E7 OVERLAY 2
2314	REF	3	LAST 153	E7,1630	END-E7.3	EQUALS	END-ALIG	FIRST UNUSED LOCATION IN E7 OVERLAY 3
2315				E7,1777	END-E7.4	EQUALS	3777	** LAST LOCATION USED IN E7 OVERLAY 4 **
2316	REF	1		E7,1655	END-E7.5	EQUALS	TXC +2	FIRST UNUSED LOCATION IN E7 OVERLAY 5
2317				E7,1777	END-E7	EQUALS	3777	**LAST LOCATION USED IN E7 **

A2318

*** END OF LUMERASE.12E ***

L INTERRUPT LEAD INS

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0001					4000		SETLOC 4000		
00015	REF	1					CCUNT# \$3/RUPTS		FIX-FIX LEAD INS
0002					4000	0 0004 0	INHINT		GC
0003	REF	1			4001	3 4054 1	CAF	GCBB	
0004	REF	1			4002	56 006 1	XCF	BBANK	
0005	REF	1			4003	1 2665 1	TCF	GEPRCG	
0006	REF	1			4004	52 011 0	EXCH	ARUPT	T6PUPT
0007					4005	0 0006 1	EXTEND		
0008	REF	1			4006	3 4056 0	DCA	T6ADR	
0009					4007	52 006 0	DTCB		
0010	REF	2	LAST	154	4008	52 011 0	EXCH	ARLPT	T5RLPT - AUTCPILCT
0011					4009	0 0006 1	EXTEND		
0012	REF	1			4010	3 1264 0	DCA	T5ACP	
0013					4011	52 006 0	DTCB		
0014	REF	3	LAST	154	4014	52 011 0	EXCH	ARUPT	T3RLPT
0015	REF	1			4015	3 4057 1	CAF	T3PPTBB	
0016	REF	2	LAST	154	4016	56 006 1	XCH	BBANK	
0017	REF	1			4017	1 3410 0	TCF	T3RUPT	
0018	REF	4	LAST	154	4020	52 011 0	EXCH	ARLPT	T4PUPT
0019	REF	1			4021	3 4064 1	CAF	T4RPTBB	
00195	REF	3	LAST	154	4022	56 006 1	XCF	BBANK	
0020	REF	1			4023	1 2000 1	TCF	T4RLPT	
0023	REF	5	LAST	154	4024	52 011 0	EXCH	ARUPT	KEYRLPT1
0024	REF	1			4025	3 4060 0	CAF	KEYRFTBB	
0025	REF	4	LAST	154	4026	56 006 1	XCH	BBANK	
0026	REF	1			4027	1 3256 1	TCF	KEYRUFT1	
0027	REF	6	LAST	154	4030	52 011 0	EXCH	ARUPT	KEYRUFT2
0028	REF	1			4031	3 4061 1	CAF	MKRPTBB	
0029	REF	5	LAST	154	4032	56 006 1	XCF	BBANK	
0030	REF	1			4033	1 2332 0	TCF	MARKRUPT	
0031	REF	7	LAST	154	4034	52 011 0	EXCH	ARUPT	UPRLPT
0032	REF	1			4035	3 4060 0	CAF	UPRPTBB	
0033	REF	6	LAST	154	4036	56 006 1	XCH	BBANK	
0034	REF	1			4037	1 3301 1	TCF	UPPUPT	
0035	REF	8	LAST	154	4040	52 011 0	EXCH	ARLPT	DCWNRUFT
0036	REF	1			4041	3 4062 1	CAF	DWNRPTBB	
0037	REF	7	LAST	154	4042	56 006 1	XCF	BBANK	
0038	REF	1			4043	1 2472 1	TCF	DCDCWNTN	
0039	REF	9	LAST	154	4044	52 011 0	EXCH	ARUPT	PACAR PLPT
0040	REF	1			4045	3 4063 0	CAF	PDPPTBB	

L INTERRUPT LEAD INS

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0041	REF	8	LAST	154	4046	56 006 1	XCH	PPANK
0042	REF	1			4047	1 3157 0	TCF	RADAREAC

0043	REF	10	LAST	154	4050	52 011 0	DXCH	ARUPT	RLPTIC IS USED ONLY BY LANDING GUIDANCE
0044	REF	1			4051	3 4065 0	CA	RUPTICBB	
0045	REF	9	LAST	155	4052	56 006 1	XCH	BEANK	
0046	REF	1			4053	1 2202 0	TCF	PITFALL	

0047	REF	1			E3,1400		EBANK=	LST1	RESTART USES EQ, E3
0048	REF	2	LAST	154	4054	12102 0 G0BB	BBCCN	GCPCRG	

0049	REF	1			E6,1464		EBANK=	PERPRC
0050	REF	1			4055	02117 1 T6ADR	2CACF	DCT6RLPT
0051	REF	1			4056	36106 0		

0051	REF	2	LAST	155	E3,1400		EBANK=	LST1
0052	REF	2	LAST	154	4057	02112 1 T2RPTBB	BBCCN	T3RLPT

0053	REF	1			0073		EBANK=	KEYTEMP1
0054	REF	2	LAST	154	4060	10110 1 KEYPPTBB	BBCCN	KEYRLPT1

0055	REF	1			E7,1404		EBANK=	ACTAZ
0056	REF	2	LAST	154	4061	16107 0 MKRUPTBB	BBCCN	MARKRUPT

0057	REF	2	LAST	154	4060		UPRPTBB	=	KEYPPTBB
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0058	REF	1			0340		EBANK=	DNTMBLFF
0059	REF	2	LAST	154	4062	12100 0 DWRPTBB	BBCCN	DCCDWTM

0060	REF	2	LAST	140	E7,1453		EBANK=	TTCGC
0061	REF	2	LAST	155	4063	52107 0 RCRPTBB	BBCCN	RADAREAC

0062	REF	1			E6,1414		EBANK=	N11
0063	REF	2	LAST	154	4064	14106 0 T4RPTBB	PRCON	T4RUPT

00631	REF	2	LAST	141	E7,1444		EBANK=	FLVIRA
00632	REF	2	LAST	155	4065	22107 1 RLPTICBB	BBCCN	PITFALL

L T4PLPT PROGRAM

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0001				12,2000				BANK 12	
000101	REF	1		06,2000				SETLCC T4PLP	
000102				06,2000				BANK	
0002	REF	2	LAST 156	06,1414				EBANK= M11	
00025	REF	1						COUNT# \$1/T4PPT	
0003	REF	1		06,2000	54 016 1	T4RUPT	TS	BANKRUPT	
0004				06,2001	2 3006 1			EXTEND	
0005	REF	1		06,2002	22 012 1			GXCH QRUPT	
0007	REF	1		06,2003	11 310 0			CCS DSPUPTSW	ECES 7(-1)0 AROUND AND AROUND
0008	REF	1		06,2004	1 2010 0			TCF NCPMT4 +1	
0009	REF	2	LAST 156	06,2005	1 2007 0			TCF NCPMT4	
0010	REF	1		06,2006	1 2134 1			TCF QLIKDCP	
0015	REF	1		06,2007	3 4757 0	NCPMT4	CAF	SEVEN	
0016	REF	1		06,2008	54 070 1		TS	RLPTRFC1	
0017	REF	2	LAST 156	06,2011	55 310 0		TS	DSRUPTSW	
0019				4066				BLOCK 02	
001901	REF	1		4066				SETLCC FF1AG10	
001902				4066				BANK	
001904	REF	1						COUNT# \$1/T4PPT	
0020	REF	1		7732		100MRUPT =	OCT37766	(DEC 16374)	
0023	RELTAR IS A PACKED TABLE. RELAYCODE CODE IN UPPER 4 BITS, RELAY CODE								
0024	IN LOWER 5 BITS.								
0025				4066	04025 1	RELTAR	CCT	04025	
0026				4067	10003 0		CCT	10003	
0027				4070	14031 0		CCT	14031	
0028				4071	20033 0		CCT	20033	
0029				4072	24017 1		CCT	24017	
0030				4073	30036 1		CCT	30036	
0031				4074	34034 1		CCT	34034	
0032				4075	40023 1		CCT	40023	
0033				4076	44035 1		CCT	44035	
0034				4077	50037 0		CCT	50037	
0035				4100	54000 0		CCT	54000	
0036				4101	60000 1	RELTAR11	OCT	60000	

L T4RUPT PROGRAM

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P0037 SWITCHED-BANK PORTION.

0038					12,2000			BANK	12
003801	REF	2	LAST	156	06,2000			SETLCC	T4RUP
0038'2					06,2012			BANK	
0039	REF	2	LAST	156	TC 156:	10	10*	CCUNT*	\$4/T4EPT
0042	REF	1			06,2012	11'035	1	CCS	DSPTAB +110
0043	REF	1			06,2013	0 2063	0	TC	DSPOUT
0044	REF	2	LAST	157	06,2014	0 2063	0	TC	DSFCLT
0045	REF	2	LAST	157	06,2015	57'035	0	XCH	DSPTAB +110
0046	REF	1			06,2016	7 4356	1	MASK	LCW11
0047	REF	3	LAST	157	06,2017	55'035	1	TS	DSPTAB +110
0048	REF	1			06,2020	6 4101	0	AD	RFLTAB11
0049	REF	1			06,2021	0 0006	1	EXTENC	
00491	REF	1			06,2022	01 010	1	WRITE	OUTO
00492	REF	1			06,2023	0 2071	0	TC	HANG20

L T4RUPT PROGRAM

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PCC50 DSFLUT PROGRAM. PLTS CUT DISPLAYS.

0055	REF	1		06,2024	55'015 C	DSPCLTSE	TS	NCUT	
0056	REF	1		06,2025	4 4755 0		CS	ZERO	
0057	REF	1		06,2026	54 073 1		TS	DSRUPTEN	SFT TC -C FCP 1ST PASS THRU DSPTAB
0058	REF	1		06,2027	56 775 1		XCH	DSPCNT	
0059	REF	1		06,2030	6 4754 C		AD	NEGO	TO PREVENT +C
0060	REF	2	LAST	158	06,2031	54 775 C	TS	DSPCNT	
0061	REF	3	LAST	158	06,2032	50 775 1	DSPSCAN	INDEX	DSPCNT
0062	REF	4	LAST	157	06,2033	11'022 1	CCS	DSPTAB	
0063	REF	4	LAST	158	06,2034	10 775 0	CCS	DSPCNT	IF DSPTAB ENTRY +, SKIP
0064	REF	1		06,2035	1 2030 1		TCF	DSPSCAN -2	IF DSPCNT +, TRY AGAIN
0065	REF	1		06,2036	1 2047 1		TCF	DISPLAY	IF DSPTAB ENTRY -, DISPLAY
0066				06,2037	00012 1	TABLNTH	OCT	12	DEC 10 LENGTH OF DSPTAB
0067	REF	2	LAST	158	06,2040	10 073 1	CCS	DSRUPTEN	IF DSRUPTEN=+C, 2ND PASS THRU DSPTAB
0068				06,2041	37764 C	120MRLPT	DEC	16372	(DSPCNT = 0). +C INTO NCUT.
0069	REF	2	LAST	158	06,2042	55'015 0	TS	NCUT	
0070	REF	2	LAST	93	06,2043	0 0002 0	TC	C	
0071	REF	3	LAST	158	06,2044	54 073 1	TS	DSRUPTEN	IF DSRUPTEN=-C, 1ST PASS THRU DSPTAB
0072	REF	1		06,2045	3 2037 1		CAF	TABLNTH	(DSPCNT=C). +C INTO DSRUPTEN. PASS AGAIN
0073	REF	2	LAST	158	06,2046	1 2031 0	TCF	DSPSCAN -1	
0074	REF	1		06,2047	6 4753 1	DISPLAY	AD	CNE	
0075	REF	5	LAST	158	06,2050	50 775 1	INDEX	DSPCNT	
0076	REF	6	LAST	158	06,2051	55'022 1	TS	DSPTAB	REPLACE POSITIVELY
0077	REF	2	LAST	157	06,2052	7 4356 1	MASK	LCW11	REMOVE BITS 12 TO 15
0078	REF	4	LAST	158	06,2053	54 073 1	TS	DSRUPTEN	
0079	REF	1		06,2054	3 4350 0		CAF	H15	
0080	REF	6	LAST	158	06,2055	50 775 1	INDEX	DSPCNT	
0081	REF	1		06,2056	7 4066 1		MASK	RELTAB	PICK UP BITS 12 TO 15 OF RELTAB ENTRY
0082	REF	5	LAST	158	06,2057	6 0073 0	AD	DSRUPTEN	
0083				06,2060	0 0005 1		EXTEND		
0084	REF	2	LAST	157	06,2061	01 010 1	WRITE	CLTO	
00841	REF	1		06,2062	1 6742 1		TCF	Q+1	
00842	REF	1		06,2063	10 101 0	DSPCNT	CCS	FLAGWRC5	IS CKEY FLAG ON
00843	REF	2	LAST	158	06,2064	3 4755 1	CAF	ZERO	NO
00844	REF	1		06,2065	1 2130 0		TCF	NO DSPCNT	NO
00845	REF	3	LAST	158	06,2066	11'015 C	CCS	NCUT	YES
00846	REF	1		06,2067	0 2024 C		TC	DSPCLTSE	
00847	REF	2	LAST	158	06,2070	1 2130 0	TCF	NO DSPCNT	NO DISPLAY REQUESTS
0085	REF	1		06,2071	4 2171 0	HANG2C	CS	14,11,9	
0086	REF	3	LAST	156	06,2072	27'310 0	AFS	DSRUPTEN	
0087	REF	1		06,2073	3 7734 C		CAF	20MRLPT	
0088	REF	1		06,2074	54 027 C	SETTIME4	TS	TIME4	

L T4RLPT PROGRAM

LSEF'S PAGE NO. 4 E6 S4

PO0881 THE STATUS OF THE PROCEED PUSHBUTTON IS MONITORED EVERY 120 MILLISECCNCS VIA THE CHANNEL 32 BIT 14 INBIT.
 RO08812 THE STATE OF THIS INBIT IS COMPARED WITH ITS STATE DURING THE PREVIOUS T4RLPT AND IS PROCESSED AS FOLLOWS.

RO08814 IF PREV CN AND NOW CN - BYPASS
 RO08815 IF PREV CN AND NOW OFF - UPDATE IMODES33
 RO08816 IF PREV OFF AND NOW CN - UPDATE IMODES33 AND PROCESS VIA PINBALL
 RO08817 IF PREV OFF AND NOW OFF - BYPASS

RO08818 THE LOGIC EMPLOYED REQUIRES ONLY 9 MCT (APPROX. 108 MICROSECCNDS) OF COMPUTER TIME WHEN NO CHANGES OCCUR.

00882	REF	1		06,2075	3 1300 0	PPCCEPDE CA	IMODES33	MONITOR FOR PROCEED BUTTON
008821				06,2076	0 0006 1	EXTEND		
008822	REF	1		06,2077	06 022 0	RXOR	CHAN32	
008823	REF	12	LAST 87	06,2100	7 4736 0	MASK	BIT14	
008824				06,2101	0 0006 1	EXTEND		
008825	REF	1		06,2102	1 2116 1	BZF	T4JUMP	NO CHANGE
008826	REF	2	LAST 159	06,2103	23 300 0	LXCF	IMODES33	
008827				06,2104	0 0006 1	EXTEND		
008828	REF	1		06,2105	06 001 0	RXOR	LCHAN	
008829	REF	3	LAST 159	06,2106	55 300 1	TS	IMODES33	UPDATE IMODES33
00883	REF	13	LAST 159	06,2107	7 4736 0	MASK	BIT14	
008831	REF	1		06,2110	10 000 0	CCS	A	
008832	REF	2	LAST 159	06,2111	1 2116 1	TCF	T4JUMP	WAS CN - NOW OFF
008833	REF	1		06,2112	3 4355 0	CAF	CHRPRI0	WAS OFF - NOW CN
008834	REF	1		06,2113	0 5072 1	TC	NCVAC	
008835	REF	1		06,2114	03506 1	EBANK=	DSPCCLNT	
008836	REF	1		06,2114	03506 1	ZCADR	PROCKEY	
008836	REF	1		06,2115	60101 1			

L T4RLPT PROGRAM

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P0089 JUMP TO APPROPRIATE PLACE-PER SECOND (.96 SEC ACTUALLY) ACTIVITY

0090	REF	2	LAST	156	06,2116	50 070 0	T4JUMP	INDEX	RLPTREG1
0091					06,2117	1 2120 1		TCF	+1

0092	REF	1			06,2120	0 3164 1		TC	RCSMONIT
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0093	REF	1			06,2121	1 3006 0		TCF	RRAUTCHK
------	-----	---	--	--	---------	----------	--	-----	----------

0094	REF	1			06,2122	1 2172 0		TCF	INUMON
------	-----	---	--	--	---------	----------	--	-----	--------

0095	REF	1			06,2123	1 2140 0		TCF	DAPT4S
------	-----	---	--	--	---------	----------	--	-----	--------

0096	REF	2	LAST	160	06,2124	0 3164 1		TC	RCSMONIT
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0097	REF	2	LAST	160	06,2125	1 3006 0		TCF	RRAUTCHK
------	-----	---	------	-----	---------	----------	--	-----	----------

0098	REF	2	LAST	160	06,2126	1 2172 0		TCF	INUMON
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0099	REF	2	LAST	160	06,2127	1 3140 0		TCF	DAPT4S
------	-----	---	------	-----	---------	----------	--	-----	--------

0102	REF	1			7734		20VRLPT =	OCT37776	(DEC 16382)
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L T4EUPY PROGRAM

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P0150 ADDITIONAL ROUTINES FOR 20MS. KEYBOARD ACTIVITY

0151					06,2130	0 0006 1	NODSPCUT	EXTEND	
0152	REF	3	LAST	158	06,2131	01 010 1		WRITE	CLTO
0153	REF	1			06,2132	3 2041 0		CAF	12CMRLPT
0154	REF	1			06,2133	1 2074 1		TCF	SETTIME4
0155	REF	14	LAST	159	06,2134	2 4736 1	QUICKESP	CAF	BIT14
01551	REF	4	LAST	158	06,2135	7 1310 0		MASK	DSRUPTSW
01552					06,2136	0 0006 1		EXTEND	
01553	REF	1			06,2137	1 2165 0		RZF	QUICKOFF
									WRCTE LAST TIME, NOW TURN OFF RELAYS.
01555	REF	4	LAST	158	06,2140	11 0115 0		CCS	NCUT
0156	REF	2	LAST	158	06,2141	0 2024 0		TC	DSFCLTSE
0157	REF	1			06,2142	1 2152 1		TCF	NODSPY
01576	REF	15	LAST	161	06,2143	4 4736 0		CS	BIT14
01577	REF	5	LAST	161	06,2144	27 0110 0	QUIKRLPT	ADS	DSPLPTSW
									NCLT=0 OR BAD RETURN FROM DSFCUTSE GCOD RETURN (WE DISPLAYED SOMETHING)
0158	REF	2	LAST	158	06,2145	3 7734 0		CAF	2CMRLPT
0159	REF	2	LAST	158	06,2146	54 027 0		TS	TIME4
0160	REF	12	LAST	87	06,2147	3 4743 0		CAF	BIT9
0161	REF	6	LAST	161	06,2150	27 0310 0		ADS	DSRUPTSW
0162	REF	1			06,2151	0 5270 1		TC	RESUME
0163					06,2152	0 0006 1	NODSPY	EXTEND	
0164	REF	4	LAST	161	06,2153	01 010 1		WRITE	CLTO
0165	REF	3	LAST	161	06,2154	3 7734 0	SYNCT4	CAF	2CMRLPT
0166	REF	3	LAST	161	06,2155	26 027 0		ADS	TIME4
0167	REF	13	LAST	161	06,2156	3 4743 0		CAF	BIT9
0168	REF	7	LAST	161	06,2157	27 0310 0		ADS	DSRUPTSW
0169	REF	8	LAST	161	06,2160	11 0310 0		CCS	DSRUPTSW
0170	REF	2	LAST	161	06,2161	0 5270 1		TC	RESUME
0171					06,2162	37737 0	OCT37737	CCT	37737
0172	REF	1			06,2163	0 2154 0		TC	SYNCT4
0173	REF	3	LAST	161	06,2164	0 5270 1		TC	RESUME
0174					06,2165	0 0006 1	QUICKOFF	EXTEND	
0175	REF	5	LAST	161	06,2166	01 010 1		WRITE	CLTO
0176	REF	16	LAST	161	06,2167	3 4736 1		CAF	BIT14
0177	REF	1			06,2170	1 2144 0		TCF	QUIKRUPT
0179					06,2171	22400 0	14,11,9	CCT	22400

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P0300 PROGRAM NAME: IMUMON

P0301 FUNCTIONAL DESCRIPTION: THIS PROGRAM IS ENTERED EVERY 480 MS. IT DETECTS CHANGES OF THE IMU STATUS BITS IN
 R0303 CHANNEL 30 AND CALLS THE APPROPRIATE SUBROUTINES. THE BITS PROCESSED AND THEIR RELEVANT SUBROUTINES ARE:

R0305	FUNCTION	BIT	SUBROUTINE CALLED
R0306	-----	---	-----
R0307	TEMP IN LIMITS	15	TLIM
R0308	ISS TURN-ON REQUEST	14	ITLPNCA
R0309	IMU FAIL	13	IMUFAIL (SETISSW)
R0310	IMU CDU FAIL	12	ICDUFAIL (SETISSW)
R0311	IMU CAGE	11	IMUCAGE
R0312	IMU OPERATE	9	IMUCP

R0313 THE LAST SAMPLED STATE OF THESE BITS IS LEFT IN IMODES30. ALSO, EACH SUBROUTINE CALLED FINDS THE NEW
 R0315 VALUE OF THE BIT IN A, WITH Q SET TO THE PROPER RETURN LOCATION, NEXTIFAIL.

R0317 CALLING SEQUENCE: T4PUPT EVERY 480 MILLISECONDS.

R0318 JOBS OR TASKS INITIATED: NONE.

R0319 SUBROUTINES CALLED: TLIM, ITLPNCA, SETISSW, IMUCAGE, IMUCP.

R0320 ERASABLE INITIALIZATION:

R0321 FRESH START OR RESTART WITH NO GROUPS ACTIVE: C(IMODES30) = OCT 37411.

R0323 RESTART WITH ACTIVE GROUPS: C(IMODES30) = (B(IMODES30) AND (OCT 00025)) PLUS OCT 37400.
 R0325 THIS LEAVES IMU FAIL BITS INTACT.

R0326 ALARMS: NONE.

R0327 EXIT: TNONTEST.

R0328 OUTPUT: UPDATED IMODES30 WITH CHANGES PROCESSED BY APPROPRIATE SUBROUTINE.

0330	REF	1		06,2172	3 1277 1	IMUMON	CA	IMODES30	SEE IF THERE HAS BEEN A CHANGE IN THE
0331				06,2173	0 0006 1		EXTEND		RELEVANT BITS OF CHAN 30.
0332	REF	1		06,2174	06 030 1		RXOR	CHAN30	
0333	REF	1		06,2175	7 2761 1		MASK	30RDMSK	
0334				06,2176	0 0006 1		EXTEND		
0335	REF	1		06,2177	1 2227 0		RZF	TNONTEST	NO CHANGE IN STATUS.
0336	REF	3	LAST 160	06,2200	54 070 1		TS	RUPTRG1	SAVE BITS WHICH HAVE CHANGED.
0337	REF	2	LAST 162	06,2201	22 277 1		LXCH	IMODES30	UPDATE IMODES30.
0338				06,2202	0 0006 1		EXTEND		
0339	REF	2	LAST 159	06,2203	06 001 0		RXCR	LCHAN	
0340	REF	3	LAST 162	06,2204	55 277 0		TS	IMODES30	
0341	REF	2	LAST 158	06,2205	4 4753 0		CS	CNF	
0342	REF	4	LAST 162	06,2206	56 070 0		XCH	RUPTRG1	
0343				06,2207	1 0006 1		EXTEND		

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0344	REF	1		06,2210	6 2514 0		BZMF	TLIM	CHANGE IN IMU TEMP.	
0345	REF	1		06,2211	1 2213 1		TCF	NXTIFBIT	BEGIN BIT SCAN.	
0346	REF	3	LAST	162	06,2212	6 4753 1	-1	AC	CNE	(RE-ENTERS HERE FROM NXTIFAIL.)
0347	REF	5	LAST	162	06,2213	24 073 0	NXTIFBIT	INCR	RUPTREG1	ADVANCE EIT POSITION NUMBER.
0348					06,2214	6 0000 1	+1	CCURLE		
0349	REF	2	LAST	155	06,2215	54 000 0		TS	A	SKIP IF CVERFLOW.
0350	REF	2	LAST	163	06,2216	1 2213 1		TCF	NXTIFBIT	LOCK FOR BIT.
0351	REF	1			06,2217	56 071 1		XCF	RUPTREG2	SAVE CVERFLOW-CORRECTED DATA.
0352	REF	6	LAST	163	06,2220	50 070 0		INDEX	RUPTREG1	SELECT NEW VALUE OF THIS EIT.
0353	REF	17	LAST	161	06,2221	3 4736 1		CAF	BIT14	
0354	REF	4	LAST	162	06,2222	7 1277 0		MASK	INDEXES30	
0355	REF	7	LAST	163	06,2223	50 070 0		INDEX	RUPTREG1	
0356	REF	1			06,2224	0 2755 1		TC	IFAILJMP	
0357	REF	2	LAST	163	06,2225	10 071 0	NXTIFAIL	CCS	RUPTREG2	PROCESS ANY ADDITIONAL CHANGES.
0358	REF	3	LAST	163	06,2226	1 2212 0		TCF	NXTIFBIT -1	

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P0359 PROGRAM NAME: TNCNTEST.

R0361 FUNCTIONAL DESCRIPTION: THIS PROGRAM HONORS REQUESTS FOR ISS INITIALIZATION. ISS TURN-ON (CHANNEL 30 BIT 14)
 R0362 AND ISS OPERATE (CHANNEL 31 BIT 9) REQUESTS ARE TREATED AS A PAIR AND PROCESSING TAKES PLACE .480 SECONDS
 R0364 AFTER EITHER ONE APPEARS. THIS INITIALIZATION TAKES ON ONE OF THE FOLLOWING THREE FORMS:

R0366 1) ISS TURN-ON: IN THIS SITUATION THE COMPUTER IS OPERATING WHEN THE ISS IS TURNED ON. NORMALLY,
 R0368 BOTH ISS TURN-ON AND ISS OPERATE APPEAR. THE PLATFORM IS CAGED FOR 90 SECONDS AND THE ICCL'S ZEROED
 R0370 SO THAT AT THE END OF THE PROCESS THE GIMBAL LOCK MONITOR WILL FUNCTION PROPERLY.

R0372 2) ICCL INITIALIZATION: IN THIS CASE THE COMPUTER WAS PROBABLY TURNED ON WITH THE ISS IN OPERATE OR
 R0374 A FRESH START WAS DONE WITH THE ISS IN OPERATE. IN THIS CASE ONLY ISS OPERATE IS ON. THE ICCL'S ARE
 R0376 ZEROED SO THE GIMBAL LOCK MONITOR WILL FUNCTION. AN EXCEPTION IS IF THE ISS IS IN GIMBAL LOCK AFTER
 R0378 A RESTART, THE ICCL'S WILL NOT BE ZEROED.

R0379 3) RESTART WITH RESTARTABLE PROGRAM USING THE IMU: IN THIS CASE, NO INITIALIZATION TAKES PLACE SINCE
 R0381 IT IS ASSUMED THAT THE USING PROGRAM DID THE INITIALIZATION AND THEREFORE T4RUPT SHOULD NOT INTERFERE.

R0383 IMCDFS30 BIT 7 IS SET = 1 BY THE FIRST BIT (CHANNEL 30 BIT 14 OR 9) WHICH ARRIVES. FOLLOWING THIS, TNCNTEST IS
 R0385 ENTERED, FINDS BIT 7 = 1 BUT BIT 8 = 0, SO IT SETS BIT 8 = 1 AND EXITS. THE NEXT TIME IT FINDS BIT 8 = 1 AND
 R0387 PROCEEDS, SETTING BITS 8 AND 7 = 0. AT PROCTNON, IF ISS TURN-ON REQUEST IS PRESENT, THE ISS IS CAGED (ZERO +
 R0389 COARSE). IF ISS OPERATE IS NOT PRESENT PROGRAM ALARM 00213 IS ISSUED. AT THE END OF A 90 SECOND CAGE, BIT 2
 R0391 OF IMCDFS30 IS TESTED. IF IT IS = 1, ISS TURN-ON WAS NOT PRESENT FOR THE ENTIRE 90 SECONDS. IN THAT CASE, IF
 R0393 THE ISS TURN-ON REQUEST IS PRESENT THE 90 SECOND WAIT IS REPEATED, OTHERWISE NO ACTION OCCURS UNLESS A PROGRAM
 R0395 WAS WAITING FOR THE INITIALIZATION IN WHICH CASE THE PROGRAM IS GIVEN AN IMUSTALL ERROR RETURN. IF THE DELAY
 R0397 WENT PROPERLY, THE ISS DELAY OUTPUT IS SENT AND THE ICCL'S ZEROED. A TASK IS INITIATED TO REMOVE THE PIPA FAIL
 R0399 INHIBIT BIT IN 10.24 SECONDS. IF A MISSION PROGRAM WAS WAITING IT IS INFORMED VIA ENDIML.

R0401 AT PROCTNON, IF ONLY ISS OPERATE IS PRESENT (CPCONLY), THE CDU'S ARE ZEROED UNLESS THE PLATFORM IS IN COARSE
 R0403 ALIGN (= GIMBAL LOCK HERE) OR A MISSION PROGRAM IS USING THE IML (IMLSEFLC = 1).

R0405 CALLING SEQUENCE: T4RUPT EVERY 480 MILLISECONDS AFTER IMUNON.

R0406 JOBS OR TASKS INITIATED: 1) ENDIMON, 90 SECONDS AFTER CAGING STARTED. 2) ISSUP, 4 SECONDS AFTER CAGING DONE.
 R0408 3) PFAILCK, 10.24 SECONDS AFTER INITIALIZATION COMPLETED. 4) UNZ2, 320 MILLISECONDS AFTER ZEROING
 R0410 STARTED.

R0411 .SUPROUTINES CALLED: CACFSUB, CACFSUB2, ZFR7ICCL, ENDIMU, IMUBAD, NCATTFF, SETISSW, VARDELAY.

R0413 FRASABLE INITIALIZATION: SEE IMUNON.

R0414 ALARMS: PROGRAM ALARM 00213 IF ISS TURN-ON REQUESTED WITHOUT ISS OPERATE.

R0416 EXIT: ENDIMON EXITS TO C03TEST. TASKS HAVING TO DO WITH INITIALIZATION EXIT AS FOLLOWS: MISSION PROGRAM
 R0418 WAITING AND INITIALIZATION COMPLETE, EXIT TO ENDIMU, MISSION PROGRAM WAITING AND INITIALIZATION FAILED, EXIT TO
 R0420 IMUBAD, IMU NOT IN USE, EXIT TO TASKOVER.

R0421 CLIPLT: ISS INITIALIZED.

0422 REF 5 LAST 163 26,2727 4 1277 C TNCNTEST CS IMCDFS30 AFTER PROCESSING ALL CHANGES, SEE IF IT

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0423	REF	14	LAST	88	06,2230	7 4745 1	MASK	BIT7	IS TIME TO ACT ON A TURN-CN SEQUENCE.
0424	REF	3	LAST	163	06,2231	10 000 0	CCS	A	
0425	REF	1			06,2232	1 2374 1	TCF	C33TEST	NO - EXAMINE CHANNEL 33.

0426	REF	14	LAST	87	06,2233	3 4744 1	CAF	BIT8	SEE IF FIRST SAMPLE OR SECOND.
0427	REF	6	LAST	164	06,2234	7 1277 0	MASK	IMODES30	
0428	REF	4	LAST	165	06,2235	10 000 0	CCS	A	
0429	REF	1			06,2236	1 2242 0	TCF	PROCTACN	REACT AFTER SECOND SAMPLE.

0430	REF	15	LAST	165	06,2237	3 4744 1	CAF	BIT8	IF FIRST SAMPLE, SET BIT TO REACT NEXT
0431	REF	7	LAST	165	06,2240	27 277 0	ADS	IMODES30	TIME.
0432	REF	2	LAST	165	06,2241	1 2374 1	TCF	C33TEST	

R0433 PROCESS IMU TURN-CN REQUESTS AFTER WAITING 1 SAMPLE FOR ALL SIGNALS TO ARRIVE.

0435	REF	1			06,2242	4 2777 0	PROCTACN	CS	BITS788	
0436	REF	8	LAST	165	06,2243	7 1277 0	MASK	IMODES30		
0437	REF	9	LAST	165	06,2244	55 277 0	TS	IMODES30		
0438	REF	18	LAST	162	06,2245	7 4736 0	MASK	BIT14	SEE IF TURN-CN REQUEST.	
0439	REF	5	LAST	165	06,2246	10 000 0	CCS	A		
0440	REF	1			06,2247	1 2347 1	TCF	CFCNLY	OPERATE CN ONLY.	

0441	REF	10	LAST	165	06,2250	4 1277 0	CS	IMODES30	IF TURN-CN REQUEST, WE SHOULD HAVE IMU
0442	REF	14	LAST	161	06,2251	7 4743 1	MASK	BIT9	OPERATE.
0443	REF	6	LAST	165	06,2252	10 000 0	CCS	A	
0444					06,2253	1 2256 0	TCF	+3	

0445	REF	1			06,2254	0 5567 0	TC	ALARM	ALARM IF NOT.
0446					06,2255	00213 1	CC1	213	

0447	REF	1			06,2256	0 2735 1	+3	TC	CAGESLB
0448	REF	1			06,2257	3 3005 1	CAF	90SECS	
0449	REF	1			06,2260	0 5203 0	TC	WAITLIST	
0450	REF	3	LAST	156	06,1414		FBANK=	M11	
0451	REF	1			06,2261	02266 1	2CADR	ENDTACN	
0451	REF	1			06,2262	14186 0			

0452	REF	3	LAST	165	06,2263	1 2374 1	TCF	C33TEST	
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0453	REF	2	LAST	165	06,2264	3 3005 1	RETACN	CAF	90SECS
0454	REF	1			06,2265	0 5224 0	TC		VARDELAY

0455	REF	13	LAST	88	06,2266	4 4752 1	ENDTACN	CS	BIT2	RESET TURN-CN REQUEST FAIL BIT.
0456	REF	11	LAST	165	06,2267	7 1277 0	MASK	IMODES30		
0457	REF	12	LAST	165	06,2270	57 277 1	XCF	IMODES30		
0458	REF	14	LAST	165	06,2271	7 4752 1	MASK	BIT2	IF IT WAS OFF, SEND ISS DELAY COMPLETE.	
0459					06,2272	0 0006 1	EXTEND			
0460	REF	1			06,2273	1 2376 1	BZF	ENDTACN2		

0461	REF	19	LAST	165	06,2274	3 4736 1	CAF	BIT14	IF IT WAS ON AND TURN-CN REQUEST NOW
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0462	REF	13	LAST	165	06,2275	7 1277 0		MASK	IMODES30	PRESNT, RE-ENTER 90 SEC DELAY IN WL.
0463					06,2276	0 0076 1		EXTEND		
0464	REF	1			06,2277	1 2264 1		BZF	RETEND	
0465	REF	1			06,2310	4 0074 0		CS	FLAGWRD0	IF IT IS NOT ON NOW, SEE IF A PRG WAS
0466	REF	1			06,2311	7 4744 0		MASK	IMLSEBIT	WAITING.
0467	REF	7	LAST	165	06,2312	10 000 0		CCS	A	
0468	REF	1			06,2313	1 5261 0		TCF	TASKCOVER	
0469	REF	1			06,2314	0 4635 0		TC	POSTJUMP	
0470	REF	1			06,2315	17631 0		CACR	IMURAC	UNSUCCESSFUL TURN-ON.
0471	REF	13	LAST	87	06,2316	3 4735 1	ENDTNGN2	CAF	BIT15	SEND ISS DELAY COMPLETE.
0472					06,2317	0 0076 1		EXTEND		
0473	REF	1			06,2318	05 012 1		WCR	CHAN12	
0474	REF	1			06,2311	0 4674 0		TC	IBNKCALL	TURN OFF AC ATT LAMP.
0475	REF	1			06,2312	17260 0		CACR	NCATTCPF	
0476	REF	1			06,2313	0 5457 1	LN72	TC	ZEPICIDL	
0477	REF	1			06,2314	4 4763 0		CS	BITS485	REMOVE ZERO AND COARSE.
0478					06,2315	0 0006 1		EXTEND		
0479	REF	2	LAST	166	06,2316	03 012 1		WAND	CHAN12	
0480	REF	14	LAST	132	06,2317	3 4741 1		CAF	BIT11	WAIT 10 SECS FOR CTRS TC FIND GIMBALS
0481	REF	2	LAST	165	06,2321	0 5224 0		TC	VARDELAY	
0482	REF	1			06,2321	4 2774 0	ISSUP	CS	DCT54	REMOVE CAGING, IML FAIL INHIBIT, AND
0483	REF	14	LAST	166	06,2322	7 1277 0		MASK	IMODES30	ICDUFAIL INHIBIT FLAGS.
0484	REF	15	LAST	166	06,2323	55 277 0		TS	IMODES30	
0485	REF	14	LAST	88	06,2324	4 4746 1		CS	BIT6	ENABLE DAP
0486	REF	4	LAST	155	06,2325	7 1200 1		MASK	IMODES33	
0487	REF	5	LAST	166	06,2326	55 300 1		TS	IMODES33	
04871	REF	1			06,2327	4 2076 1		CS	FLAGWRD2	TEST DRIFTFLG: IF ON, DO NOTHING BECAUSE
04872	REF	1			06,2330	7 4735 0		MASK	DRPTEIT	IMUCCMP SHOULD BE ALL SET UP (RESTART
04873					06,2331	0 0006 1		EXTEND		WITH IMLSE DOWN). IF OFF, SET DRIFTFLG
04874					06,2332	1 2336 1		BZF	+4	AND 1/PIFACT TO GET FREEFALL IMUCCMP
04875	REF	2	LAST	166	06,2332	26 076 1		ADS	FLAGWRD2	CING (FRESH START OR ISS TURN-ON).
04876	REF	1			06,2334	3 0025 0		CA	TIMEI	
04877	REF	1			06,2335	57 074 0		XCH	1/PIFACT	CANNOT GET HERE IF RESTART WITH IMLSE UP
0488	REF	1			06,2336	0 2713 1		TC	SETISSW	ISS WARNING MIGHT HAVE BEEN INHIBITED.
0489	REF	14	LAST	166	06,2337	4 4735 0		CS	BIT15	REMOVE IMU DELAY COMPLETE DISCRETE.
0490					06,2340	0 0006 1		EXTEND		
0491	REF	3	LAST	166	06,2341	03 012 1		WAND	CHAN12	
0492	REF	1			06,2342	3 5003 1		CAF	4SECS	DO NOT ENABLE PROG ALARM ON PIP FAIL FOR

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0493	REF	2	LAST	165	06,2343	0 5203 0		TC	WAITLIST	ANOTHER 4 SECS.
0494	REF	1			06,2344	0 5203 0		EBANK=	CCUIND	
0495	REF	1			06,2344	0 5203 0		2CADR	PFAILCK	
0495	REF	1			06,2345	1 16113 1				
0499	REF	2	LAST	166	06,2346	1 5261 0		TCF	TASKCOVER	
0502	REF	11	LAST	88	06,2347	3 4751 1	OPONLY	CAF	BIT4	IF OPERATE CN ONLY, AND WE ARE IN CCARSE
0503	REF	1			06,2350	0 0006 1		EXTEND		ALIGN, COUNT ZERO THE CCUS BECAUSE WE
0504	REF	4	LAST	166	06,2351	02 012 0		RAND	CHAN12	MIGHT BE IN GIMBAL LOCK
0505	REF	8	LAST	166	06,2352	10 000 0		CCS	A	
0506	REF	4	LAST	165	06,2353	1 2374 1		TCF	C33TEST	
0507	REF	2	LAST	166	06,2354	3 4744 1		CAF	TMUSEBIT	OTHERWISE, ZERO THE COUNTERS.
0508	REF	2	LAST	166	06,2355	7 0074 0		MASK	FLAGWRD	UNLESS SOMEONE IS USING THE IML.
0509	REF	9	LAST	167	06,2356	10 000 0		CCS	A	
0510	REF	5	LAST	167	06,2357	1 2374 1		TCF	C33TEST	
0511	REF	1			06,2360	0 2746 0		TC	CAGESUB2	SET TURNON FLAGS.
05115	REF	2	LAST	166	06,2361	0 4674 0	ISSZERO	TC	IBANKCALL	TURN OFF NC ATT LAMP
05116	REF	2	LAST	166	06,2362	17260 0		CADR	NCATTCEFF	IML CAGE OFF ENTRY
0512	REF	12	LAST	88	06,2363	3 4747 1		CAF	BIT5	ISS CCU ZERO
0513	REF	1			06,2364	0 0006 1		EXTEND		
0514	REF	5	LAST	167	06,2365	05 012 1		WCR	CHAN12	
05141	REF	2	LAST	166	06,2366	0 5457 1		TC	ZEROCIDL	
0515	REF	15	LAST	166	06,2367	3 4746 0		CAF	BIT6	WAIT 300 MS FOR AGS TO RECEIVE SIGNAL.
0516	REF	3	LAST	167	06,2370	0 5203 0		TC	WAITLIST	
0517	REF	4	LAST	165	06,1414			EBANK=	M11	
0518	REF	1			06,2371	02313 1		2CADF	UNZ2	
0518	REF	1			06,2372	14106 0				
0519	REF	6	LAST	167	06,2373	1 2374 1		TCF	C33TEST	

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R0520 PROGRAM NAME: C33TEST

R0521 FUNCTIONAL DESCRIPTION: THIS PROGRAM MONITORS THREE FLIP-FLIP INBITS OF CHANNEL 33 AND CALLS THE APPROPRIATE
 R0523 SUBROUTINE TO PROCESS A CHANGE. IT IS ANALOGOUS TO IMCMON, WHICH MONITORS CHANNEL 30, EXCEPT THAT IT READS
 R0525 CHANNEL 33 WITH A WAND INSTRUCTION BECAUSE A 'WRITE' PULSE IS REQUIRED TO RESET THE FLIP-FLIPS. THE BITS
 R0527 PROCESSED AND THE SUBROUTINES CALLED ARE:

R0528	BIT	FUNCTION	SUBROUTINE
R0529	---	-----	-----
R0530	13	PIPA FAIL	PIPEFAIL
R0531	12	DOWNLINK TOO FAST	DNTMFAST
R0532	11	UPLINK TOO FAST	UPTMFAST

R0533 UPON ENTRY TO THE SUBROUTINE, THE NEW BIT STATE IS IN A.

R0534 CALLING SEQUENCE: EVERY 480 MILLISECONES AFTER TMONTEST.

R0535 JOBS OR TASKS INITIATED: NONE.

R0536 SUBROUTINES CALLED: PIPEFAIL, DNTMFAST AND UPTMFAST ON BIT CHANGES.

R0537 FRASABLE INITIALIZATION: C(IMCDES33) = OCT 16000 ON A FRESH START OR RESTART, THEREFORE, THESE ALARMS WILL
 R0539 REAPPEAR IF THE CONDITIONS PERSIST.

R0540 ALARMS: NONE.

R0541 EXIT: GLOCKMON.

R0542 OUTPUT: UPDATED BITS 13, 12 AND 11 OF IMCDES33 WITH CHANGES PROCESSED.

0543	REF	6	LAST	166	06,2374	3 1300 0	C33TEST	CA	IMCDES33	SEE IF RELEVANT CHAN 33 BITS HAVE
0544	REF	1			06,2375	7 5026 1		MASK	33PDMASK	
0545	REF	2	LAST	93	06,2376	54 001 1		TS	L	CHANGED.
0546	REF	2	LAST	168	06,2377	3 5026 0		CAF	33PDMASK	
0547					06,2400	0 0006 1		EXTEND		
0548	REF	1			06,2401	03 033 1		WAND	CHAN33	RESETS FLIP-FLIP INPUTS
0549					06,2402	0 0006 1		EXTEND		
0550	REF	3	LAST	162	06,2403	06 001 0		RXCR	LCHAN	
0551					06,2404	0 0006 1		EXTEND		
0552	REF	1			06,2405	1 2434 1		RZF	GLOCKMON	ON NO CHANGE.
0553	REF	8	LAST	163	06,2406	54 070 1		TS	RUPTPEGI	SAVE BITS WHICH HAVE CHANGED.
0554	REF	7	LAST	168	06,2407	23 000 0		LXCH	IMCDES33	
0555					06,2410	0 0006 1		EXTEND		
0556	REF	4	LAST	168	06,2411	06 001 0		RXOR	LCHAN	
0557	REF	8	LAST	168	06,2412	54 000 1		TS	IMCDES33	UPDATED IMCDES33.
0558	REF	3	LAST	158	06,2413	3 4755 1		CAF	ZERO	
0559	REF	9	LAST	168	06,2414	56 070 0		XCH	RUPTPEGI	
0560					06,2415	6 0006 1		DCPLR		

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0561	REF	1		06,2416	1 2421 0		TCF	NXTIBT +1	SCAN FOR BIT CHANGES.
0562	REF	4	LAST	163	06,2417	6 4753 1 -1	AD	CNF	
0563	REF	10	LAST	168	06,2420	24 070 0	NXTIBT	INCR	RUPTRREG1
0564					06,2421	6 0000 1 +1	DOUBLE		
0565	REF	10	LAST	167	06,2422	54 000 0	TS	A	(CODING IDENTICAL TO CHAN 30).
0566	REF	2	LAST	169	06,2423	1 2420 1	TCF	NXTIBT	
0567	REF	3	LAST	163	06,2424	56 071 1	XCH	PLPTRREG2	
0568	REF	11	LAST	169	06,2425	50 070 0	INDEX	RUPTRREG1	GET NEW VALUE OF BIT WHICH CHANGED.
0569	REF	15	LAST	87	06,2426	3 4727 0	CAF	BIT13	
0570	REF	9	LAST	168	06,2427	7 1200 1	MASK	IMODES33	
0571	REF	12	LAST	169	06,2430	50 070 0	INDEX	RUPTRREG1	
0572	REF	1			06,2431	0 2763 1	TC	C33JMP	
0573	REF	4	LAST	169	06,2432	10 071 0	NXTFL32	CCS	RUPTRREG2
0574	REF	3	LAST	169	06,2433	1 2417 0	TCF	NXTIBT -1	PROCESS POSSIBLE ADDITIONAL CHANGES.

L T4RPT PROGRAM

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R0575 PROGRAM NAME: CLECKMCA

R0576 FUNCTIONAL DESCRIPTION: THIS PROGRAM MONITORS THE CDUZ COUNTER TO DETERMINE WHETHER THE ISS IS IN GIMBAL LOCK
 R0578 AND TAKES ACTION IF IT IS. THREE REGIONS OF MIDDLE GIMBAL ANGLE (MGA) ARE USED:

R0580 1) ABS(MGA) LESS THAN OR EQUAL TO 70 DEGREES - NORMAL MODE.

R0581 2) ABS(MGA) GREATER THAN 70 DEGREES AND LESS THAN OR EQUAL TO 85 DEGREES - GIMBAL LOCK LAMP TURNED ON.

R0583 3) ABS(MGA) GREATER THAN 85 DEGREES - ISS PUT IN COARSE ALIGN AND NO ATT LAMP TURNED ON.

R0585 CALLING SEQUENCE: EVERY 480 MILLISECONDS AFTER C33TEST.

R0586 JOBS OR TASKS INITIATED: NONE.

R0587 SUBROUTINES CALLED: 1) SETCCAPS WHEN ABS(MGA) GREATER THAN 85 DEGREES AND ISS NOT IN COARSE ALIGN.

R0589 2) LAMTEST BEFORE TURNING OFF GIMBAL LOCK LAMP.

R0590 FRASABLE INITIALIZATION:

R0591 1) FRESH START OR RESTART WITH NO GROUPS ACTIVE: C(CDUZ) = 0, IMCCES30 BIT 6 = 0, IMCCES32 BIT 1 = 0.

R0593 2) RESTART WITH GROUPS ACTIVE: SAME AS FRESH START EXCEPT C(CDUZ) NOT CHANGED SO GIMBAL MONITOR
 R0595 PROCEEDS AS BEFORE.

R0596 ALARMS: 1) MGA REGION (2) CAUSES GIMBAL LOCK LAMP TO BE LIT.

R0597 2) MGA REGION (3) CAUSES THE ISS TO BE PUT IN COARSE ALIGN AND THE NO ATT LAMP TO BE LIT IF EITHER NOT
 R0599 SO ALREADY.

0600	REF	1		06,2434	1 034 1	CLECKMCA CCS	CDUZ	
0601	REF	1		06,2435	1 2441 0	TCF	GLOCKCHK	SEE IF MAGNITUDE OF MGA IS GREATER THAN
0602	REF	1		06,2436	1 2465 0	TCF	SETGLOCK	70 DEGREES.
0603	REF	2	LAST 170	06,2437	1 2441 0	TCF	GLOCKCHK	
0604	REF	2	LAST 170	06,2440	1 2465 0	TCF	SETGLOCK	
0605	REF	1		06,2441	6 2512 0	GLOCKCHK AD	-70DEGS	
0606				06,2442	0 0006 1	EXTEND		
0607	REF	2	LAST 170	06,2443	6 2464 0	BZMF	SETGLOCK -1	NO LOCK.
0608	REF	1		06,2444	6 2513 1	AD	-15DEGS	SEE IF ABS(MGA) GREATER THAN 85 DEGREES.
0609				06,2445	0 0006 1	EXTEND		
0610	REF	1		06,2446	6 2462 0	PZMF	NOGIMFUN	
0611	REF	12	LAST 167	06,2447	3 4750 1	CAF	BIT4	IF SO, SYSTEM SHOULD BE IN COARSE ALIGN
0612				06,2448	0 0006 1	EXTEND		TO PREVENT GIMBAL RUNAWAY.
0613	REF	6	LAST 167	06,2451	02 012 0	RAND	CHAN12	
0614	REF	11	LAST 169	06,2452	10 000 0	CCS	A	
0615	REF	2	LAST 170	06,2453	1 2462 1	TCF	NOGIMFUN	
0616	REF	3	LAST 167	06,2454	0 4674 0	TC	IBNKCALL	
0617	REF	1		06,2455	17136 0	CAER	SETCCAPS	
06173	REF	1		06,2456	3 6245 1	CAF	SIX	ENABLE ISS ERROR COUNTERS IN 60 MS
06174	REF	4	LAST 167	06,2457	0 5203 0	TC	WAITLIST	

L T4PUPT PROGRAM

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06175	REF	2	LAST	167	F3,1474		EBANK=	COLIND		
06176	RFF	1			06,2460	03132 1	2CADR	CA+ECE		
06176	RFF	1			06,2461	16103 1				
0618	REF	16	LAST	167	06,2462	3 4746 0	NOGIMRLN	CAF	BIT6	TUPN CN GIMBAL LOCK LAMP.
0619	REF	4	LAST	170	06,2463	1 2465 0	TCF	SETGLOCK		
0620	RFF	4	LAST	168	06,2464	3 4755 1	-1	CAF	ZERO	
0621	RFF	6	LAST	158	06,2465	6 1035 0	SETGLOCK	AD	DSPTAB +110	SEE IF PRESENT STATE OF GIMBAL LOCK LAMP
0622	REF	17	LAST	171	06,2466	7 4746 1	MASK	BIT6		AGREES WITH DESIRED STATE BY HALF ADDING
0623					06,2467	0 1006 1	EXTEND			THE TWO.
0624	RFF	1			06,2470	1 5270 0	BZF	GLOCKCK		CK AS IS.
0625	REF	7	LAST	171	06,2471	7 1035 1	MASK	DSPTAB +110		IF OFF, CNTN TURN ON IF IMU BEING CAGED.
0626	REF	12	LAST	170	06,2472	10 000 0	CCS	A		
0627	REF	1			06,2473	1 2507 0	TCF	GLAMPTST		TURN OFF UNLESS LAMP TEST IN PROGRESS.
0628	REF	18	LAST	171	06,2474	3 4746 0	CAF	BIT6		
0629	REF	16	LAST	166	06,2475	7 1277 0	MASK	IMODES30		
0630	REF	13	LAST	171	06,2476	10 000 0	CCS	A		
0631	REF	2	LAST	171	06,2477	1 5270 0	TCF	GLCKCK		
0632	REF	8	LAST	171	06,2500	4 1035 1	GLINVERT	CS	DSPTAB +110	INVERT GIMBAL LOCK LAMP.
0633	REF	19	LAST	171	06,2501	7 4746 1	MASK	BIT6		
0634	REF	15	LAST	166	06,2502	6 4735 1	AD	BIT15		TO INDICATE CHANGE IN DSPTAB +110.
0635	RFF	9	LAST	171	06,2503	57 1035 0	XCF	DSPTAB +110		
0636	RFF	1			06,2504	7 2162 1	MASK	CCT37737		
0637	RFF	10	LAST	171	06,2505	27 1035 1	ADS	DSPTAB +110		
0638	REF	3	LAST	171	06,2506	1 5270 0	TCF	GLCKCK		
0639	RFF	1			06,2507	0 2766 1	GLAMPTST	TC	LAMPTST	TUPN OFF UNLESS LAMP TEST IN PROGRESS.
0640	REF	4	LAST	171	06,2510	1 5270 0	TCF	GLCKCK		
0641	RFF	1			06,2511	1 2500 1	TCF	GLINVERT		
0642					06,2512	63434 1	-70DEGS	DEC	-0.38888	-70 DEGREES SCALD IN HALF-REVOLUTIONS.
0643					06,2513	75252 0	-15DEGS	DEC	-0.08333	

L T4RUPT PROGRAM

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R0644 PROGRAM NAME: TLIM.

R0645 FUNCTIONAL DESCRIPTION: THIS PROGRAM MAINTAINS THE TEMP LAMP (BIT 4 OF CHANNEL 11) ON THE DSKY TO AGREE WITH
 R0647 THE TEMP SIGNAL FROM THE ISS (BIT 15 OF CHANNEL 30). HOWEVER, THE LIGHT WILL NOT BE TURNED OFF IF A LAMP TEST
 R0649 IS IN PROGRESS.

R0650 CALLING SEQUENCE: CALLED BY IMUMON ON A CHANGE OF BIT 15 OF CHANNEL 30.

R0651 JOBS OF TASKS INITIATED: NONE.

R0652 SUBROUTINES CALLED: LAMPTEST.

R0653 FRASABLE INITIALIZATION: FRESH START AND RESTART TURN THE TEMP LAMP OFF.

R0655 ALARMS: TEMP LAMP TURNED ON WHEN IMU TEMP GOES OUT OF LIMITS.

R0656 EXIT: NXTIFAIL.

R0657 OUTPUT: SERVICE OF TEMP LAMP.

IN A, EXCEPT FOR TLIM.

0659	REF	1		06,2514	7 4733 0	TLIM	MASK	PCSMAX	REMOVE BIT FROM WORD OF CHANGES AND SET
0660	REF	5	LAST 169	06,2515	54 071 0		TS	RLPTSEG2	DSKY TEMP LAMP ACCORDINGLY.
0661	REF	17	LAST 171	06,2516	11'277 0		CCS	IMDDFS30	
0662	REF	1		06,2517	1 2525 0		TCF	TEMPCK	
0663	REF	2	LAST 172	06,2520	1 2525 0		TCF	TEMPCK	
0664	REF	17	LAST 170	06,2521	3 4750 1		CAF	BIT4	TURN ON LAMP.
0665				06,2522	0 0006 1		EXTEND		
0666	REF	1		06,2523	5 011 1		WOR	DSALMCUT	
0667	REF	1		06,2524	1 2225 1		TCF	NXTIFAIL	
0668	REF	2	LAST 171	06,2525	1 2766 1	TEMPCK	TC	LAMPTEST	IF TEMP NOW OK, DO NOT TURN OFF LAMP IF
0669	REF	2	LAST 172	06,2526	1 2225 1		TCF	NXTIFAIL	LAMP TEST IN PROGRESS.
0670	REF	14	LAST 172	06,2527	4 4750 0		CS	BIT4	
0671				06,2530	0 0006 1		EXTEND		
0672	REF	2	LAST 172	06,2531	03 011 1		WAND	DSALMCUT	TURN OFF LAMP
0673	REF	3	LAST 172	06,2532	1 2225 1		TCF	NXTIFAIL	

L T4PORT PROGRAM

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R0674 PROGRAM NAME: ITURNON.

R0675 FUNCTIONAL DESCRIPTION: THIS PROGRAM IS CALLED BY IMCMON WHEN A CHANGE OF BIT 14 OF CHANNEL 30 (ISS TURN-CN REQUEST) IS DETECTED. UPON ENTRY, ITURNON CHECKS IF A TURN-ON DELAY SEQUENCE HAS FAILED, AND IF SC, IT EXITS. IF NOT, IT CHECKS WHETHER THE TURN-ON REQUEST CHANGE IS TO CN OR OFF. IF CN, IT SETS BIT 7 OF IMODES30 TO 1 SO THAT TMCNTST WILL INITIATE THE ISS INITIALIZATION SEQUENCE. IF OFF, THE TURN-CN DELAY SIGNAL, CHANNEL 12 BIT 15, IS CHECKED AND IF IT IS CN, ITURNON EXITS. IF THE DELAY SIGNAL IS OFF, PROGRAM ALARM 00207 IS ISSUED, BIT 2 OF IMODES30 IS SET TO 1 AND THE PROGRAM EXITS.

R0686 THE SETTING OF BIT 2 OF IMODES30 (ISS DELAY SEQUENCE FAIL) INHIBITS THIS ROUTINE AND IMCOP FROM PROCESSING ANY CHANGES. THIS BIT WILL BE RESET BY THE ENCTNON ROUTINE WHEN THE CURRENT 90 SECOND DELAY PERIOD ENDS.

R0691 CALLING SEQUENCE: FROM IMCMON WHEN ISS TURN-CN REQUEST CHANGES STATE.

R0692 JOBS OR TASKS INITIATED: NONE.

R0693 SUBROUTINES CALLED: ALARM, IF THE ISS TURN-CN REQUEST IS NOT PRESENT FOR 90 SECONDS.

R0695 FRASABLE INITIALIZATION: FRESH START AND RESTART SET BIT 15 OF CHANNEL 12 AND BITS 2 AND 7 OF IMODES30 TO 1, AND BIT 14 OF IMODES30 TO 1.

R0698 ALARMS: PROGRAM ALARM 00207 IS ISSUED IF THE ISS TURN-CN REQUEST SIGNAL IS NOT PRESENT FOR 90 SECONDS.

R0700 EXIT: NXTIFAIL.

R0701 OUTPUT: BIT 7 OF IMODES30 TO START ISS INITIALIZATION, OR BIT 2 OF IMODES30 AND PROGRAM ALARM 00207 TO INDICATE A FAILED TURN-CN SEQUENCE.

0704	REF	15	LAST	165	06,2533	3 4752 0	ITURNON	CAF	BIT2	IF DELAY REQUEST HAS GONE OFF
0705	REF	18	LAST	172	06,2534	7 1277 0		MASK	IMODES30	PREMATURELY, DO NOT PROCESS ANY CHANGES
0706	REF	14	LAST	171	06,2535	10 000 0		CCS	A	UNTIL THE CURRENT 90 SEC WAIT EXPIRES.
0707	REF	4	LAST	172	06,2536	1 2225 1		TCF	NXTIFAIL	
0708	REF	20	LAST	165	06,2537	3 4736 1		CAF	BIT14	SEE IF JUST ON OR OFF.
0709	REF	19	LAST	173	06,2540	7 1277 0		MASK	IMODES30	
0710					06,2541	0 0006 1		EXTEND		
0711	REF	1			06,2542	1 2556 1		BZF	ITURNON2	IF JUST CN.
0712	REF	16	LAST	171	06,2543	3 4735 1		CAF	BIT15	
0713					06,2544	0 0006 1		EXTEND		SEE IF DELAY PRESENT DISCRETE HAS BEEN
0714	REF	7	LAST	170	06,2545	02 012 0		RAND	CHAN12	SENT. IF SC, ACTION COMPLETE
0715					06,2546	0 0006 1		EXTEND		
0716					06,2547	1 2551 0		BZF	+2	
0717	REF	5	LAST	173	06,2550	1 2225 1		TCF	NXTIFAIL	
0718	REF	16	LAST	173	06,2551	3 4752 0		CAF	BIT2	IF NOT, SET BIT TO INDICATE REQUEST NOT
0719	REF	20	LAST	173	06,2552	27 277 0		ADS	IMODES30	PRESENT FOR FULL DURATION.
0720	REF	2	LAST	165	06,2553	0 5567 0		TC	ALARM	
0721					06,2554	00277 1		ACT	207	
0722	REF	6	LAST	173	06,2555	1 2225 1		TCF	NXTIFAIL	

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0723	PEF	21	LAST	173	06,2556	4 1277 0	ITURNEN2	CS	1WCCES30	SFT BIT7 TO INDICATE WAIT OF 1 SAMPLE
0724	PEF	15	LAST	165	06,2557	7 4745 1		MASK	BIT7	
0725	PEF	22	LAST	174	06,2560	27 277 0		ADS	IMODES30	
0726	PEF	1			06,2561	3 2564 1		CAF	RRINIT	
07261	PEF	1			06,2562	54 110 0		TS	RADMCCES	
0727	PEF	7	LAST	173	06,2563	1 2225 1		TCF	NXTIFAIL	
07271					06,2564	00102 1	RRINIT	CCT	00102	

L T4RLPT PROGRAM

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R0728 PROGRAM NAME: IMLCAGE.

R0729 FUNCTIONAL DESCRIPTION: THIS PROGRAM PROCESSES CHANGES OF THE IMLCAGE INBIT, CHANNEL 30 BIT 11. IF THE BIT
 R0731 CHANGES TO 0 (CAGE BUTTON PRESSED), THE ISS IS CAGED (ICDU ZERO + CCARSE ALIGN + NO ATT LAMP) UNTIL THE
 R0733 ASTRONAUT SELECTS ANOTHER PROGRAM TO ALIGN THE ISS. ANY PULSE TRAINS TO THE ICCL'S AND GYRO'S ARE TERMINATED,
 R0735 THE ASSOCIATED OUTCOUNTERS ARE ZEROED AND THE GYRO'S ARE DE-SELECTED. NO ACTION OCCURS WHEN THE BUTTON IS
 R0737 RELEASED (INBIT CHANGES TO 1).

R0738 CALLING SEQUENCE: BY IMUMCN WHEN IMU CAGE BIT CHANGES.

R0739 JOBS OR TASKS INITIATED: NONE.

R0740 SUBROUTINES CALLED: CAGESUB.

R0741 ERASABLE INITIALIZATION: FRESH START AND RESTART SET BIT 11 OF IMCDES20 TO 1.

R0743 ALARMS: NONE.

R0744 EXIT: NXTIFAIL.

R0745 OUTPUT: ISS CAGED, COUNTERS ZEROED, PULSE TRAINS TERMINATED AND NO ATT LAMP LIT.

0747	REF	15	LAST	173	06,2565	10 300 0	IMUCAGE	CCS	A	NO ACTION IF CCING OFF.
0748	REF	1			06,2566	1 2361 0		TCF	ISSZERO	
0749	REF	1			06,2567	4 3002 1		CS	CCT7700	TERMINATE ICPU,ICDU, GYRO PULSE TRAINS
0750					06,2570	0 0006 1		EXTEND		
0751	REF	1			06,2571	03 014 1		WAND	CHAN14	
0752	REF	1			06,2572	4 2776 1		CS	CCT272	KNOCK DOWN DISPLAY INERTIAL DATA, IMU
07521					06,2573	0 0006 1		EXTEND		ERROR COUNTER ENABLE, ZERO ICPU, CCARSE
07522	REF	8	LAST	173	06,2574	03 012 1		WAND	CHAN12	ALIGN ENABLE, RE ERROR COUNTER ENABLE.
075221	REF	1			06,2575	4 4745 1		CS	ENGCONBIT	INSURE ENGCONFLC IS CLEAR.
075222	REF	2	LAST	158	06,2576	7 0101 0		MASK	FLAGWRD5	
075223	REF	2	LAST	175	06,2577	54 101 0		TS	FLAGWRD5	
07523	REF	1			06,2600	4 4355 1		CS	PRI030	TURN ENGINE OFF.
07524					06,2601	0 0006 1		EXTEND		
07525	REF	2	LAST	172	06,2602	02 011 0		RAND	DSALMCUT	
075251	REF	21	LAST	173	06,2603	6 4736 1		AD	RIT14	
075252					06,2604	0 0006 1		EXTEND		
075253	REF	4	LAST	175	06,2605	01 011 0		WRITE	DSALMCUT	FORCE BIT14=1, BIT13=0.
07526	REF	1			06,2606	0 2743 0		TC	CAGESUB1	
07527	REF	4	LAST	170	06,2607	0 4674 0		TC	IPNKCALL	KNOCK DOWN TRACK, PEFSMMAT, DRIFT FLAGS
07528	REF	1			06,2610	17167 1		CADR	RADREFOR	
0753	REF	5	LAST	171	06,2611	4 4755 0		CS	ZERO	
0754	REF	1			06,2612	54 050 0		TS	CDUXCMD	
0755	REF	1			06,2613	54 051 1		TS	CDUYCMD	

I T4RUPT PROGRAM

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0756	PEF	1		06,2614	54 052 1
0757	PEF	1		06,2615	54 047 0

TS	CDUZCMD
TS	GYPCMD

0758	PEF	1		06,2616	4 3001 1
0759				06,2617	0 0006 1
0760	PEF	2	LAST 175	06,2620	03 014 1
0761	PEF	8	LAST 174	06,2621	1 2225 1

CS	OCT740
EXTEND	
WAND	CHAN14
TCF	EXTIFAIL

HAVING WAITED AT LEAST 27 MCT FROM
GYRC PULSE TRAIN TERMINATION, WE CAN
DE-SELECT THE GYRCS

L T4RUPT PROGRAM

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R0762 PROGRAM NAME: IMUP.

R0763 FUNCTIONAL DESCRIPTION: THIS PROGRAM PROCESSES CHANGES IN THE ISS OPERATE DISCRETE, BIT 9 OF CHANNEL 30.

R0765 IF THE INBIT CHANGES TO 0, INDICATING ISS ON, IMUP GENERALLY SETS BIT 7 OF IMODES30 TO 1 TO REQUEST ISS
 R0767 INITIALIZATION VIA TACNTST. AN EXCEPTION IS DURING A FAILED ISS DELAY DURING WHICH BIT 2 OF IMODES30 IS SET
 R0769 TO 1 AND NO FURTHER INITIALIZATION IS REQUIRED. WHEN THE INBIT CHANGES TO 1, INDICATING ISS OFF, IMUSEFLG IS
 R0771 TESTED TO SEE IF ANY PROGRAM WAS USING THE ISS. IF SO, PROGRAM ALARM 00214 IS ISSUED.

R0773 CALLING SEQUENCE: BY INUMON WHEN BIT 9 OF CHANNEL 30 CHANGES.

R0774 JOBS OR TASKS INITIATED: NONE.

R0775 SUBROUTINES CALLED: ALARM, IF ISS IS TURNED OFF WHILE IN USE.

R0776 ERASABLE INITIALIZATION: ON FRESH START AND RESTART, BIT 9 OF IMODES30 IS SET TO 1 EXCEPT WHEN THE GIMBAL LOCK
 R0778 LAMP IS ON, IN WHICH CASE IT IS SET TO 0. THIS PREVENTS ICDU ZERO BY TACNTST WITH THE ISS IN GIMBAL LOCK.

R0780 ALARMS: PROGRAM ALARM 00214 IF THE ISS IS TURNED OFF WHILE IN USE.

R0781 EXIT: NXTIFAIL.

R0782 OUTPUT: ISS INITIALIZATION REQUEST (IMODES30 BIT 7) OR PROGRAM ALARM 00214.

0784 06,2622 0 0006 1 IMUP EXTEND

0785 REF 1 06,2623 1 2643 0 BZF IMUPF2

0786 REF 10 LAST 169 06,2624 4 1300 1 CS IMODES33 DISABLE CAP

0787 REF 20 LAST 171 06,2625 7 4746 1 MASK BIT6

0788 REF 11 LAST 177 06,2626 27 1300 1 ADS IMODES33

07885 REF 5 LAST 175 06,2627 0 4674 0 TC IBNKCALL KNOCK DOWN TRACK, REFSMMAT, DRIFT FLAGS

07886 REF 2 LAST 175 06,2630 17167 1 CADR RNDREFDR

07887 REF 2 LAST 165 06,2631 4 2777 0 CS BITS768 KNOCK DOWN REFDEZVCUS, IMOUSE FLAGS

07888 REF 3 LAST 167 06,2632 7 0074 0 MASK FLAGWPC0

0789 REF 4 LAST 177 06,2633 56 074 1 XCH FLAGWRD0 IF CCING OFF, ALARM IF PRCG USING IMU.

07891 06,2634 4 0000 0 COM

0790 REF 1 06,2635 7 4744 0 MASK IMUSEFLG

0791 REF 16 LAST 175 06,2636 10 000 0 CCS A

0792 REF 9 LAST 176 06,2637 1 2225 1 TCF NXTIFAIL

0793 REF 3 LAST 173 06,2640 0 5567 0 TC ALARM

0794 06,2641 00214 0 CCT 214

0795 REF 10 LAST 177 06,2642 1 2225 1 TCF NXTIFAIL

0796 REF 17 LAST 173 06,2643 3 4752 0 IMUP2 CAF BIT2 SEE IF FAILED ISS TURN-ON SEQ IN PRCC.

0797 REF 23 LAST 174 06,2644 7 1277 0 MASK IMODES30

0798 REF 17 LAST 177 06,2645 10 000 0 CCS A

0799 REF 11 LAST 177 06,2646 1 2225 1 TCF NXTIFAIL

0800 REF 2 LAST 172 06,2647 1 2556 1 TCF ITURNEN2

IF SC, COUNT PROCESS UNTIL PRESENT 90 SECONDS EXPIRES.

L T4DUPT PROGRAM

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R0801 PROGRAM NAME: PIPFAIL

R0802 FUNCTIONAL DESCRIPTION: THIS PROGRAM PROCESSES CHANGES OF BIT 13 OF CHANNEL 33, PIPA FAIL. IT SETS BIT 10 OF
 R0804 IMCDES30 TO AGREE. IT CALLS SETISSW IN CASE A PIPA FAIL NECESSITATES AN ISS WARNING. IF NOT, I.E., IMCDES30
 R0806 BIT 1 = 1, AND A PIPA FAIL IS PRESENT AND THE ISS IS NOT BEING INITIALIZED, PROGRAM ALARM 00212 IS ISSUED.

R0808 CALLING SEQUENCE: BY CR2TEST ON CHANGES OF CHANNEL 33 BIT 13.

R0809 JCBS OR T/SSKS INITIATED: NONE.

R0810 SUBROUTINES CALLED: 1) SETISSW, AND 2) ALARM (SEE FUNCTIONAL DESCRIPTION).

R0812 ERASABLE INITIALIZATION: SEE IMCEN FOR INITIALIZATION OF IMCDES30. THE RELEVANT BITS ARE 5, 7, 8, 9, AND 10.

R0814 ALARMS: PROGRAM ALARM 00212 IF PIPA FAIL IS PRESENT BUT NEITHER ISS WARNING IS TO BE ISSUED NOR THE ISS IS
 R0816 BEING INITIALIZED.

R0817 EXIT: NXTFL33.

R0818 OUTPUT: PROGRAM ALARM 00212 AND ISS WARNING MAINTENANCE.

0819	REF	18	LAST	177	06,2650	10 000 0	PIPFAIL	CCS	A	SET BIT10 IN IMCDES30 SO ALL ISS WARNING
0820	REF	14	LAST	132	06,2651	3 4742 1		CAF	BIT10	INFO IS IN CNF REGISTER.
0821	REF	24	LAST	177	06,2652	57'277 1		XCF	IMCDES30	
0822	REF	1			06,2652	7 2004 1		MASK	-BIT10	
0823	REF	25	LAST	178	06,2654	27'277 0		ADS	IMCDES30	
0824	REF	2	LAST	166	06,2655	0 2703 1		TC	SETISSW	
0825	REF	26	LAST	178	06,2656	4 1277 0		CS	IMCDES30	IF PIP FAIL DOESNT LIGHT ISS WARNING, DO
0826	REF	13	LAST	88	06,2657	7 4753 0		MASK	BIT1	A PROGRAM ALARM IF IMC CREATING BUT NOT
0827	REF	19	LAST	178	06,2660	10 000 0		CCS	A	CACED OR BEING TURNED ON.
0828	REF	1			06,2661	1 2432 1		TCF	NXTFL33	
0829	REF	27	LAST	178	06,2662	3 1277 1		CA	IMCDES30	
0830	REF	1			06,2663	7 3000 0		MASK	OCT1720	
0831	REF	20	LAST	178	06,2664	10 000 0		CCS	A	
0832	REF	2	LAST	178	06,2665	1 2432 1		TCF	NXTFL33	ABOVE CONDITION NOT MET.
0833	REF	4	LAST	177	06,2666	0 5567 0		TC	ALARM	
0834					06,2667	00212 0		CCT	212	
0835	REF	3	LAST	178	06,2670	1 2432 1		TCF	NXTFL33	

L T4RLPT PROGRAM

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P0826 PROGRAM NAMES: DNTMFAST, LPTMFAST

R0827 FUNCTIONAL DESCRIPTION: THESE PROGRAMS PROCESS CHANGES OF BITS 12 AND 11 OF CHANNEL 33. IF A BIT CHANGES TO A
 R0839 0, A PROGRAM ALARM IS ISSUED. THE ALARMS ARE:

R0840	BIT	ALARM	CALSE
R0841	---	----	----
R0842	12	01105	DOWNLINK TOO FAST
R0843	11	01106	UPLINK TOO FAST

R0844 CALLING SEQUENCE: BY C33TEST ON A BIT CHANGE.

R0845 SUBROUTINES CALLED: ALARM, IF A BIT CHANGES TO A 0.

R0846 ERASABLE INITIALIZATION: FRESH START OR RESTART, BITS 12 AND 11 OF INCD0533 ARE SET TO 1.

R0848 ALARMS: SEE FUNCTIONAL DESCRIPTION.

R0849 EXIT: NXTFL33.

R0850 OUTPLT: PROGRAM ALARM ON A BIT CHANGE TO 0.

0851	REF	21	LAST	178	06,2671	I 0 000 0	DNTMFAST	CCS	A	CC PRG ALARM IF TM TOO FAST.
0852	REF	4	LAST	178	06,2672	1 2432 I		TCF	NXTFL33	

0853	REF	5	LAST	178	06,2673	0 5567 0		TC	ALARM	
0854					06,2674	01105 1		CCT	1105	
0855	REF	5	LAST	179	06,2675	1 2432 1		TCF	NXTFL33	

0856	REF	22	LAST	179	06,2676	I 0 000 0	LPTMFAST	CCS	A	SAME AS CNLINK TOO FAST WITH DIFFERENT
0857	REF	6	LAST	179	06,2677	1 2432 I		TCF	NXTFL33	ALARM CODE.

0858	REF	6	LAST	179	06,2700	0 5567 0		TC	ALARM	
0859					06,2701	01106 1		CCT	1106	
0860	REF	7	LAST	179	06,2702	1 2432 1		TCF	NXTFL33	

L T4RUPT PROGRAM

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P0861 PROGRAM NAME: SETISSW

R0862 FUNCTIONAL DESCRIPTION: THIS PROGRAM TURNS THE ISS WARNING LAMP ON AND OFF (CHANNEL 11 BIT 1 = 1 FOR ON,
 R0864 0 FOR OFF) DEPENDING ON THE STATUS OF IMODES30 BITS 13 (IMU FAIL) AND 4 (INHIBIT IMU FAIL), 12 (ICCU FAIL) AND
 R0866 3 (INHIBIT ICCU FAIL), AND 10 (PIPA FAIL) AND 1 (INHIBIT PIPA FAIL). THE LAMP IS LEFT ON IF A LAMP TEST IS IN
 R0868 PROGRESS.

R0869 CALLING SEQUENCE: CALLED BY IMUWON ON CHANGES TO IMU FAIL AND ICCU FAIL. CALLED BY IFAILCK AND PFAILCK UPON
 R0871 REMOVAL OF THE FAIL INHIBITS. CALLED BY PIPEAIL WHEN THE PIPA FAIL DISCRETE CHANGES. IT IS CALLED BY PIPEUSE
 R0873 SINCE THE PIPA FAIL PROGRAM ALARM MAY NECESSITATE AN ISS WARNING, AND LIKEWISE BY PIPEFREE WHEN THE ALARM DEPARTS
 R0875 AND IT IS CALLED BY IMUZERC3 AND ISSUP AFTER THE FAIL INHIBITS HAVE BEEN REMOVED.

R0877 JOBS OR TASKS INITIATED: NONE.

R0878 SUBROUTINES CALLED: NONE.

P0879 ERASABLE INITIALIZATION:

R0880 1) IMODES30 - SEE IMUWON.
 R0881 2) IMODES30 BIT 1 = 0 (LAMP TEST NOT IN PROGRESS).

R0882 ALARMS: ISS WARNING.

R08821 THE FOLLOWING PROGRAM ALARMS WILL SHOW WHICH FAILURE CAUSED THE ISS WARN

R08822 PROGRAM ALARM 00777 PIPA FAIL

R08823 PROGRAM ALARM 03777 ICCU FAIL

R08824 PROGRAM ALARM 04777 ICCU , PIPA FAILS

R08825 PROGRAM ALARM 07777 IMU FAIL

R08826 PROGRAM ALARM 10777 IMU , PIPA FAILS

R08827 PROGRAM ALARM 13777 IMU , ICCU FAILS

R08828 PROGRAM ALARM 14777 IMU , ICCU , PIPA FAILS

P0883 EXIT: VI: Q.

R0894 CLTPUT: ISS WARNING LAMP SET PROPERLY.

0885	REF	1		06,2703	3 4761 0	SETISSW	CAF	OCT15	SET ISS WARNING USING THE FAIL BITS IN
0886	REF	28	LAST	178	06,2704	7 1277 0	MASK	IMODES30	BITS 13, 12, AND 10 OF IMODES30 AND THE
0887					06,2705	0 0006 1	EXTEND		FAILURE INHIBIT BITS IN POSITIONS
0888	REF	15	LAST	178	06,2706	7 4742 0	MF	BIT10	4, 3, AND 1.
0889	REF	29	LAST	180	06,2707	3 1277 1	CA	IMODES30	
0890					06,2710	0 0006 1	EXTEND		
0891	REF	5	LAST	168	06,2711	04 001 1	RCR	LCHAN	0 INDICATES FAILURE
0892					06,2712	4 001 0	CCM		
0893	REF	1			06,2713	7 5025 1	MASK	OCT15000	
0894	REF	23	LAST	179	06,2714	10 000 0	CCS	A	
0895	REF	1			06,2715	1 2726 1	TCF	ISSWON	FAILURE.
0896	REF	14	LAST	178	06,2716	3 4753 1	CAF	BIT1	DO NOT TURN OFF ISS WARNING IF LAMP TEST
0897	REF	12	LAST	177	06,2717	7 1300 1	MASK	IMODES32	IN PROGRESS.

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0898	REF	24	LAST	180	06,2720	10 000 0	CCS	A	
0899	REF	2	LAST	158	06,2721	0 0002 0	TC	Q	
0900	REF	15	LAST	180	06,2722	4 4753 0	CS	BIT1	
0901					06,2723	0 0006 1	EXTEND		
0902	REF	5	LAST	175	06,2724	03 011 1	WAND	DSALMOUT	
0903	REF	4	LAST	181	06,2725	0 0002 0	TC	Q	
0904					06,2726	0 0006 1	ISSWON	EXTEND	
090402	REF	1			06,2727	22 066 1	QXCH	ITEMP6	
090404	REF	1			06,2730	0 5734 1	TC	VARALARM	TELL EVERYONE WHAT CAUSED THE ISSWARNING
09041	REF	16	LAST	181	06,2731	3 4753 1	CAF	BIT1	
0905					06,2732	0 0006 1	EXTEND		
0906	REF	6	LAST	181	06,2733	05 011 1	WCR	DSALMOUT	
0907	REF	2	LAST	181	06,2734	0 0066 1	TC	ITEMP6	
0908	REF	1			06,2735	4 3003 0	CAGESLB	CS	BITS6615
0909					06,2736	0 0006 1	EXTEND		SET CUTEITS AND INTERNAL FLAGS FOR
0910	REF	9	LAST	175	06,2737	03 012 1	WAND	CHAN12	SYSTEM TURN-CN OR CAGE. DISABLE THE
0911	REF	2	LAST	166	06,2740	3 4763 1	CAF	BITS465	ERROR COUNTER AND REMOVE 1ML DELAY COMF.
0912					06,2741	0 0006 1	EXTEND		SEND ZERO AND COARSE.
0913	REF	10	LAST	181	06,2742	05 012 1	WCR	CHAN12	
0914	REF	11	LAST	171	06,2743	4 1035 1	CAGESLB1	CS	DSPTAB +11D
0915	REF	1			06,2744	7 2773 1	MASK	0C40010	TURN CN AC ATT LAMP
0916	REF	12	LAST	181	06,2745	27 035 1	ADS	DSPTAB +11D	
0918	REF	30	LAST	180	06,2746	4 1277 0	CAGESLB2	CS	IMODES30
0919	REF	1			06,2747	7 2775 1	MASK	OCT75	SET FLAGS TO INDICATE CAGING OR TURN-CN
0920	REF	31	LAST	181	06,2750	27 277 0	ADS	IMODES30	AND INITIATE ALL ISS WARNING INFO
0922	REF	13	LAST	180	06,2751	4 1300 1	CS	IMODES33	DISABLE CAF AUTO AND HOLD MODES
0923	REF	21	LAST	177	06,2752	7 4746 1	MASK	BIT6	
0924	REF	14	LAST	181	06,2753	27 200 1	ADS	IMODES33	
0925	REF	5	LAST	181	06,2754	0 0002 0	TC	Q	
0926	REF	3	LAST	178	06,2703		IMCFALL	EQUALS SETISSW	
0927	REF	4	LAST	181	06,2703		ICDFALL	EQUALS SETISSW	

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P0928 JUMP TABLES AND CONSTANTS.

0929	REF	1		06,2755	1 2533 1	IFAILJMP	TCF	ITURNON	CHANNEL 20 DISPATCH.
0930	REF	1		06,2756	1 2703 0		TCF	IMUFAIL	
0931	REF	1		06,2757	1 2703 0		TCF	ICDUFAIL	
0932	REF	1		06,2760	1 2565 1		TCF	IMUCAGE	
0933				06,2761	76400 1	30PDMASK	CCT	76400	(BIT 10 NOT SAMPLED HERE).
0934	REF	1		06,2762	1 2622 1		TCF	IMUOP	
0935	REF	1		06,2763	1 2650 1	C23JMP	TCF	PIPFAIL	CHANNEL 23 DISPATCH.
0936	REF	1		06,2764	1 2671 1		TCF	DMTMEAST	
0937	REF	1		06,2765	1 2676 0		TCF	UPTMEAST	

R0938 SUBROUTINE TO SKIP IF LAMP TEST NOT IN PROGRESS.

0939	REF	15	LAST	181	06,2766	4 1300 1	LAMPTST	CS	IMODES33	BIT 1 OF IMODES33 = 1 IF LAMP TEST IN
0940	REF	17	LAST	181	06,2767	7 4753 0		MASK	BIT1	PROGRESS.
0941	REF	25	LAST	181	06,2770	10 0000 0		CCS	A	
0942	REF	6	LAST	181	06,2771	24 0002 0		INCR	0	
0943	REF	7	LAST	182	06,2772	0 0002 0		IC	G	
0944	REF	1			5026		32RDMASK	EQUALS	PRIC16	
0945					06,2773	40010 1	0040010	CCT	40010	
0947					06,2774	00054 0	00154	CCT	54	
0948					06,2775	00075 0	00175	CCT	75	
09485					06,2776	00272 0	00272	CCT	00272	
0949					06,2777	00300 1	BIT5768	CCT	300	
0950					06,3000	01720 0	001720	CCT	1720	
0951					06,3001	00740 1	00740	CCT	00740	
0952	REF	1			5025		00115000	EQUALS	PRIC15	
0953					06,3002	77000 1	00177000	CCT	77000	
0954					06,3003	40040 1	BIT56815	CCT	40040	
0955					06,3004	76777 1	-BIT10	CCT	-1000	
0956					06,3005	21450 0	90SECS	DEC	9000	
0957	REF	1			5741		120MS	=	CCT14	(DEC12)
0958	REF	4	LAST	161	5270		GLOCKCK	EQUALS	RESUME	

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R0959 PROGRAM NAME_ BRAUTCHK

R0960 FUNCTIONAL DESCRIPTION_

R0961 BRAUTCHK IS THE PENDEZVOLS RADAR INBIT MONITOR. INITIALLY THE RR

R0962 POWER CN AUTO (CHAN 23 BIT 2) INBIT IS CHECKED. IF NO CHANGE, THE

R0963 PROGRAM EXITS TO BRCDUCHK. IF A CHANGE, RADMCDES IS UPDATED

R0964 AND A CHECK MADE IF RR POWER HAS JUST COME ON. IF JUST OFF, A CHECK

R0965 IS MADE TO SEE IF A PROGRAM WAS USING THE RR (STATE BIT 7). IF NO,

R0966 THE PROGRAM EXITS TO BRCDUCHK. IF YES, PROGRAM ALARM 00514

R0967 IS REQUESTED BEFORE EXITING TO BRCDUCHK. IF RR POWER HAS JUST COME

R0968 ON, A CHECK IS MADE TO SEE IF A PROGRAM WAS USING THE RR (STATE BIT 7).

R0969 IF YES, THE PROGRAM EXITS TO BRCDUCHK WITHOUT REQUESTING THE TURN-CN

R0970 SEQUENCE. IF NO, RADMCDES IS UPDATED TO INDICATE RR CDL ZERO AND

R0971 RR TURN-CN SEQUENCE (BITS 13, 1). A 10 MILLISECOND WAITLIST CALL

R0972 IS THEN SET FOR RTURNON BEFORE THE PROGRAM EXITS TO ACPRGMON.

R0973 CALLING SEQUENCE_

R0974 T4RUPT EVERY 480 MILLISECONDS

R0975 FRASABLE INITIALIZATION REQUIRED_

R0976 RADMCDES, STATE

R0977 SUPROUTINES CALLED_

R0978 WAITLIST

R0979 JOBS OR TASKS INITIATED_

R0980 RTURNON

R0981 ALARMS_ PROGRAM ALARM 00514 - RADAR GOES OUT OF AUTO MODE WHILE BEING

R0982 USED

R0983 EXIT_ BRCDUCHK, NORREMON

0984 REF 2 LAST 174 06,3006 3 0110 1 BRAUTCHK CA RADMCDES SEE IF CHANGE IN RR AUTO MODE BIT.

0985 06,3007 0 0006 1 EXTEND

0986 REF 2 LAST 168 06,3010 06 033 1 RXOR CHAN32

0987 REF 1 06,3011 7 4752 1 MASK AUTOMBIT

0988 06,3012 0 0006 1 EXTEND

0989 REF 1 06,3013 1 3037 1 BZF BRCDUCHK

0990 REF 3 LAST 183 06,3014 22 110 1 LXOR RADMCDES UPDATE RADMCDES.

0991 06,3015 0 0006 1 EXTEND

0992 REF 6 LAST 180 06,3016 06 111 0 RXOR LCHAN

09925 REF 1 06,3017 7 3033 0 MASK OCT05776 CLR CCNT. CES., REMODE, REPOS, CDLZERC,

0993 REF 4 LAST 183 06,3020 54 110 0 TS RADMCDES AND TURNON BITS.

0994 REF 18 LAST 177 06,3021 7 4752 1 MASK BIT2 SEE IF JUST ON.

0995 REF 26 LAST 182 06,3022 10 000 0 CCS A

0996 REF 2 LAST 183 06,3023 1 3034 1 TCF BRCDUCHK -2 OFF. GC DISABLE RR CDL ERROR COUNTERS.

0999 REF 1 06,3024 3 7666 0 CA OCT10001 SET BRCDUZR AND TURNON BITS.

1000 REF 5 LAST 182 06,3025 26 110 0 AND RADMCDES

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1001	REF	5	LAST	169	06,2026	3 4753 1	CAF	CNE
1002	REF	5	LAST	170	06,3027	0 5203 0	TC	WAITLIST
1003	REF	1			07,1456		EBANK=	LCSCOUNT
1004	REF	1			06,3030	02073 1	2CAGR	RPTUPACN
1004	REF	1			06,3031	52107 0		
1005	REF	1			06,3032	1 3126 0	TCF	NOPRGMON
1006					06,3033	05776 1	CC105776	CCT 5776

L T4RUPT PROGRAM

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P1007 PROGRAM NAME_ RPDCUCHK

P1009 FUNCTIONAL DESCRIPTION_

R1009 RPDCUCHK CHECKS FOR RP CPU FAIL (CHAN 30 BIT 7). INITIALLY THE

R1010 RP CPU FAIL BIT IS SAMPLED (CHAN 30 BIT 7). IF NO CHANGE, THE

R1011 PROGRAM EXITS TO PRGIMCN. IF A CHANGE, THE RP AUTO MODE

R1012 (RADMCCES BIT 2) BIT IS CHECKED. IF NOT IN RP AUTO MODE, THE

R1013 PROGRAM EXITS TO NCRPGMCN. IF IN AUTO MODE, RADMCCES BIT 7

R1014 (RP CPU OK) IS UPDATED AND IF P-20 IS OPERATING PROGRAM ALARM 00515 IS

R1015 REQUESTED. CONTROL IS TRANSFERRED TO SETTRKF TO UPDATE

R1016 THE TRACKER FAIL LAMP (DSPTAP+110 BIT 8). CONTROL RETURNS TO

R1017 PRGIMCN.

P1018 CALLING SEQUENCE_

P1019 EVERY 480 MILLISECONDS FROM RRAUTCHK (VIA T4RUPT) UNLESS A

R1020 TURN-ON SEQUENCE HAS JUST BEEN INITIATED.

R1021 ERASABLE INITIALIZATION REQUIRED_

R1022 RADMCCES

R1023 SUBROUTINES CALLED_

R1024 SETTRKF

R1025 JCBS OR TASKS INITIATED_

R1026 NONE

R1027 ALARMS_

R1028 TRACKER FAIL

R1029 PROGRAM ALARM 00515 - RPCCU FAIL DURING P-20

R1030 EXIT_

R1031 PRGIMCN, NCRPGMCN

10315 REF 19 LAST 183 06,3034 4 4752 1 -3 CS BIT2

10316 06,3035 0 0206 1 EXTEND

10317 REF 11 LAST 181 06,3036 03 012 1 WAND CHAN12 AT TURNON, DISABLE CDL ERROR COUNTERS.

1032 REF 16 LAST 182 06,3037 3 0110 1 RPDCUCHK CA RADMCCES

1033 06,3040 0 0206 1 EXTEND LAST SAMPLED BIT IN RADMCCES.

1034 REF 2 LAST 162 06,3041 06 030 1 XORR CHAN30

1035 REF 1 06,3042 7 4745 1 MASK RCDUFRIT

1036 06,3043 0 0006 1 EXTEND

1037 REF 1 06,3044 1 3071 0 RZF PRGIMCN

1038 REF 2 LAST 182 06,3045 3 4752 0 CAF AUTOMBIT

1039 REF 7 LAST 185 06,3046 7 0110 0 MASK RADMCCES IF RP NOT IN AUTO MODE, DON'T CHANGE BIT

1040 REF 27 LAST 183 06,3047 10 000 0 CCS A 7 OF RADMCCES. IF THIS WERE NOT DONE,

1041 REF 2 LAST 184 06,3050 1 3126 0 TCF NCRPGMCN THE TRACKER FAIL MIGHT COME ON WHEN

1042 REF 2 LAST 185 06,3051 3 4745 0 CAF RCDUFRIT JUST READING LR DATA.

1042 REF 2 LAST 185 06,3051 3 4745 0 CAF RCDUFRIT SET BIT 7 OF RADMCCES FOR SETTRKF.

L T4DUPT PROGRAM

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1043	PEF	8	LAST	185	06,3052	22 110 1	LXCH	RADMODES	UPDATE RADMODES.	
1044					06,3053	0 0000 1	EXTEND			
1045	PEF	3	LAST	168	06,3054	06 001 0	RXCR	L		
1046	PEF	9	LAST	186	06,3055	54 110 0	TS	RADMODES		
1047	PEF	10	LAST	186	06,3056	2 0117 1	CA	RADMODES	DID PR CDU FAIL	
1048	REF	1			06,3057	7 4615 0	MASK	13,7,2	CDL ZERO+ CDUFAIL+ PR AUTC	
1049	REF	28	LAST	185	06,3060	10 000 0	CCS	A		
1050	REF	1			06,3061	1 207 1	TCF	TRKFLODU	NO	
1051	REF	5	LAST	177	06,3062	4 0074 0	CS	FLAGWRDC	RNDVFLG P20 CR P22 OPERATING	
1052	PEF	1			06,3063	7 4745 1	MASK	RNDVZEIT		
1053	REF	29	LAST	186	06,3064	10 000 0	CCS	A		
1054	REF	2	LAST	186	06,3065	1 3070 1	TCF	TRKFLODU	NO	
1055	PEF	7	LAST	179	06,3066	0 5567 0	TC	ALARM	YES	
1056					06,3067	00515 0	CCT	DISIS		
1057	REF	1			06,3070	0 4564 1	TPKFLODU	TC	SETTRKE	UPDATE TRACKER FAIL LAMP CN ESKY.

L T4RUPT RPROGRAM

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P1058 RPROGRAM NAME_ RRGIMCN

F AUTO MODE EXCEPT WHEN THE RR CDLS ARE

R1060 FUNCTIONAL DESCRIPTION_

TTER IS INITIATED BY THIS MONITOR WHEN
ED TO DRIVE THE GIMBALS TO T = 0 AND

R1062 RRGIMCN IS THE RR GIMBAL LIMIT MONITOR. INITIALLY THE FOLLOWING IS

R1064 CHECKED_ REMODE, RR CDLS BEING ZEROED, REPOSITION, AND RR

R1065 NOT IN AUTO MODE (RADMODES BITS 14, 13, 11 2). IF ANY OF THESE

R1066 EXIST THE PROGRAM EXITS TO GEMATRIX. IF NONE ARE PRESENT RRLIMCHK

R1067 IS CALLED TO SEE IF THE PRESENT RR CDL ANGLES (CPTY, CPTX) ARE WITHIN

R1068 THE LIMITS OF THE CURRENT MODE. IF WITHIN LIMITS, THE PROGRAM EXITS

R1069 TO NORRGMCN. IF NOT WITHIN LIMITS, THE REPOSITION FLAG (RADMODES

R1070 BIT 11) IS SET, THE RR AUTO TRACKER AND RR ERROR COUNTER

R1071 (CHAN 12 BITS 14, 2) ARE DISABLED, AND A 20 MILLISECOND WAITLIST

R1072 CALL IS SET FOR CORRECTIONS AFTER WHICH THE PROGRAM EXITS TO NORRGMCN.

R1073 CALLING SEQUENCE_

R1074 EVERY 480 MILLISECONDS FROM REDDCHK (VIA T4RUPT) UNLESS TURN-ON

R1075 HAS JUST BEEN INITIATED VIA RREALCHK OR IF THERE HAS BEEN A CHANGE IN

R1076 THE RR CDL FAIL BIT (CHAN 30 BIT 7) AND THE RR IS NOT IN THE AUTO MODE

R1077 (RADMODES BIT 2).

R1078 ERASABLE INITIALIZATION_ RADMODES

R1079 SUPPORTLINES CALLED_

R1080 RRLIMCHK, WAITLIST

R1081 JOBS OF TASKS INITIATED_

R1082 CORRECTIONS

R1083 ALARMS_

R1084 NONE

R1085 EXIT_

R1086 NORRGMCN

1087	REF	4	LAST	175	06,3071	30 101 1	RRGIMCN	CAE	FLAGWRD5	IS NO ANGLE MONITOR FLAG SET
1088	REF	1			06,3072	7 4750 0		MASK	NORRMELT	
1089	REF	30	LAST	186	06,3073	10 000 0		CCS	A	
1090	REF	13	LAST	185	06,3074	1 3126 0		TCF	NORRGMCN	YES - SKIP LIMIT CHECK
10901	REF	1			06,3075	4 0103 1		CS	FLAGWRD7	IS SERVICER RUNNING?
10902	REF	1			06,3076	7 4747 0		MASK	AVEGFRIT	
10903	REF	31	LAST	187	06,3077	10 000 0		CCS	A	
10904					06,3100	1 3105 1		TCF	+5	NO. CC R25
10905	REF	1			06,3101	3 0102 1		CA	FLAGWRD6	YES. IS MUNFLAG SET?
10906	REF	1			06,3102	7 4744 0		MASK	MUNFLBIT	
10907	REF	22	LAST	187	06,3103	10 000 0		CCS	A	
10908	REF	4	LAST	187	06,3104	1 3126 0		TCF	NORRGMCN	YES. DON'T CC R25
1091	REF	1			06,3105	3 2135 0	+5	CAF	CCT32002	INHIBIT BY REMODE, ZERGING, MONITOR.
1092	REF	11	LAST	186	06,3106	7 0110 0		MASK	RADMODES	OR RR ACT IN AUTO.
1093	REF	23	LAST	187	06,3107	10 000 0		CCS	A	
1094	REF	5	LAST	187	06,3110	1 3126 0		TCF	NORRGMCN	

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1095	REF	1		06,3111	0 4523 1	TC	PRIMCHK	SEE IF ANGLES IN LIMITS.
1096	REF	1		06,3112	00035 1	ADRES	COLT	
1097	REF	1		06,3113	1 3115 0	TCF	MCNREPOS	
1098	REF	6	LAST	187	06,3114	1 2126 0	TCF	MCNREPOS (ADDITIONAL CODING MAY GO HERE).
1099	REF	1			06,3115	3 4741 1	MCNREPOS	SFT FLAG TO SHOW REPOSITION IN PROGRESS.
1100	REF	12	LAST	187	06,3116	26 110 0	ADS	PADMCDES
1101	REF	1			06,3117	4 2136 1	CS	OCT20002 DISABLE TRACKER AND ERROR COUNTER.
1102					06,3120	0 0106 1	EXTEND	
1103	REF	12	LAST	185	06,3121	03 012 1	WAND	CHAN12
1104	REF	2	LAST	37	06,3122	3 4752 0	CAF	TWD
1105	REF	6	LAST	184	06,3123	0 5203 0	TC	WAITLIST
1106	REF	2	LAST	184	07,1456		EBANK=	LCSCCLNT
1107	REF	1			06,3124	02140 0	2CAGR	DCRREPOS
1107	REF	1			06,3125	52117 0		
1108	REF	13	LAST	188	06,3126	3 0110 1	MCNREPOS	PADMCDES IF SELECT SWITCH IS NOT IN LCC, SEND RR
11081	REF	3	LAST	185	06,3127	7 4752 1	MASK	AUTOMBIT CCU ZERO BIT TO PREVENT MEMORY CYCLE
11082	REF	24	LAST	187	06,3128	10 000 0	CCS	A SKATCHING BY MANIC RR CCUS. BIT2 OF
11083					06,3131	13 132 0	MOCP	PADMCDES AGREES WITH BIT2 OF CHANNEL
11084					06,3132	0 0006 1	EXTEND	33. FOR THIS CODING, WHICH ASSUMES
11085	REF	12	LAST	188	06,3133	05 012 1	WCR	CHAN12 AUTOMBIT = BIT2, THANKS TO FUCH B-S.
11086	REF	1			06,3134	1 3140 0	TCF	ENDRRMON
11087	REF	3	LAST	160	06,3140		ENDRRMON	ECLALS CAPT4S
1109					06,3135	32002 1	OCT32002	OCT 32002
1110					06,3136	20012 1	OCT20012	CCT 20002
1111					06,3137	02100 1	OCT02100	CCT 02100 P20,P22 MASK BITS

1 T4PLCT PROGRAM

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P1112 PROGRAM NAME: GPMATRIX (DAPT4S) ACP. NO. 2 DATE: OCTOBER 27, 1966

R1113 AUTHOR: JONATHAN D. ADDELSTON (ACAMS ASSOCIATES)

R11131 MODIFIED: 7FEB. 1968 BY P. S. WEISSMAN TO DELETE COMPUTATION OF MR12 AND MR13, WHICH ARE NO LONGER REQUIRED.

R1114 THIS PROGRAM CALCULATES ALL THE SINGLE-PRECISION MATRIX ELEMENTS WHICH ARE USED BY LEM DAP TO TRANSFORM VECTORS
 R1116 FROM GIMBAL TO PILCT (BODY) AXES AND BACK AGAIN. THESE ELEMENTS ARE USED EXCLUSIVELY BY BASIC LANGUAGE ROUTINES
 R1118 AND THEREFORE ARE NOT APPLIED FOR USE BY INTERPRETIVE PROGRAMS.

R1119 CALLING SEQUENCE: GPMATRIX IS TRANSFERRED TO FROM DAPT4S AND IS THUS EXECUTED 4 TIMES A SECOND BY T4RUPT.
 P1121 DAPT4S IS LISTED IN T4JUMP TABLE TWICE EXPLICITLY AND ALSO OCCURS AFTER BRAUTCHK (WHICH IS ALSO LISTED TWICE).

P1123 SUBROUTINES CALLED: SPSTN, SPCOS.

R1124 NORMAL EXIT MODE: TCF RESUME

R1125 ALARM AND ABORT MODES: NONE.

R1130 INPUT: CDUX, CDUY, CDUZ.

R1131 OUTPUT: M11, M21, M31, M22, M32.

R1132 ACC = CDUX, AIG = CDUY, ANG = CDUZ: MNEMONIC IS: CIM = XYZ

R1133 * * SIN(MG) 0 1 *

R1134 M = * * COS(MG)COS(CG) SIN(CG) 0 *

R1135 CP * * -COS(MG)SIN(CG) COS(CG) 0 *

R1136 * * 0 COS(CG)/COS(MG) -SIN(CG)/COS(MG) *

R1137 M = * 0 SIN(CG) COS(CG) *

R1138 PC * 1 -SIN(MG)COS(CG)/COS(MG) SIN(MG)SIN(CG)/COS(MG) *

1142 RFF 5 LAST 167 06,1414 EBANK= M11

1144 RFF 1 06,3140 DAPT4S EQUALS GPMATRIX

R1145 T4RUPT DAP LCGIC:

1146	RFF	2	LAST	170	06,3140	30 034 0	GPMATRIX	CAE	CDUZ	SINGLE ENTRY POINT
1147	RFF	1			06,3141	0 5033 1		TC	SPSIN	SIN(CDUZ) = SIN(MG)
1148	RFF	6	LAST	189	06,3142	55 1414 0		TS	M11	SCALED AT 1
1149	RFF	3	LAST	189	06,3143	30 034 0		CAE	CDLZ	
1150	RFF	1			06,3144	0 5032 0		TC	SPCOS	COS(CDLZ) = COS(MG)
1151	RFF	1			06,3145	54 061 1		TS	CCSMG	SCALED AT 1 (ONLY A FACTOR)
1152	RFF	1			06,3146	30 032 0		CAE	CDUX	
1153	RFF	2	LAST	189	06,3147	0 5033 1		TC	SPSIN	SIN(CDUX) = SIN(CG)
1154	RFF	1			06,3150	55 1417 0		TS	M22	SCALED AT 1 (ALSO IS MR22)
1155	RFF	2	LAST	189	06,3151	4 1417 0		CS	M22	

L T4FLPT PROGRAM

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1156					06,2152	0 0006 1	EXTEND		
1157	REF	2	LAST	189	06,3153	7 0061 1	MP	CCSMG	-SIN(CG)COS(MG)
1158	REF	1			06,3154	55'416 1	TS	M21	SCALED AT 1
1159	REF	2	LAST	189	06,3155	20 032 0	CAE	CDUX	
1160	REF	2	LAST	189	06,3156	0 5032 0	TC	SPCOS	COS(CDLX) = COS(CG)
1161	REF	1			06,3157	55'420 1	TS	M32	SCALED AT 1 (ALSO IS MR23)
1162					06,3160	0 5006 1	EXTEND		
1163	REF	3	LAST	190	06,3161	7 0061 1	MP	CCSMG	COS(OG)COS(MG)
1164	REF	1			06,3162	55'415 1	TS	M21	SCALED AT 1
1191	REF	5	LAST	182	06,3163	0 5270 1	TC	RESUME	
1193	REF	6	LAST	190	5270		ENDDAFT4	EQUALS	RESUME

L RCS FAILURE MONITOR

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R0001 PROGRAM DESCRIPTION

R0002 AUTHOR: J S MILLER

R00025 MODIFIED 6 MARCH 1968 BY P S WEISSMAN TO SET UP JOB FOR 1/ACCS WHEN THE MASKS ARE CHANGED.

R0003 THIS ROUTINE IS ATTACHED TO T4RLPT, AND IS ENTERED EVERY 480 MS. ITS FUNCTION IS TO EXAMINE THE LOW 8 BITS
 R0005 OF CHANNEL 32 TO SEE IF ANY ISOLATION-VALVE CLOSURE BITS HAVE APPEARED OR DISAPPEARED (THE CREW IS WARNED OF JET
 R0007 FAILURES BY LAMPS LIT BY THE GRUMMAN FAILURE-DETECTION CIRCUITRY; THEY MAY RESPOND BY OPERATING SWITCHES WHICH
 R0009 ISOLATE PAIRS OF JETS FROM THE PROPELLANT TANKS AND SET BITS IN CHANNEL 32). IN THE EVENT THAT CHANNEL 32 BITS
 R0011 DIFFER FROM 'PVALVEST', THE RECORD OF ACTIONS TAKEN BY THIS ROUTINE, THE APPROPRIATE BITS IN 'CH5MASK' &
 R0013 'CH6MASK', USED BY THE DAP JET-SELECTION LOGIC, ARE UPDATED, AS IS 'PVALVEST'. TO SPEED UP & SHORTEN THE
 R0015 ROUTINE, NO MORE THAN ONE CHANGE IS ACCEPTED PER ENTRY. THE HIGHEST-NUMBERED BIT IN CHANNEL 32 WHICH REQUIRES
 R0017 ACTION IS THE ONE PROCESSED.

R0018 THE CODING IN THE FAILURE MONITOR HAS BEEN WRITTEN SO AS TO HAVE ALMOST COMPLETE RESTART PROTECTION. FOR
 R0020 EXAMPLE, NO ASSUMPTION IS MADE WHEN SETTING A 'CH5MASK' BIT TO 1 THAT THE PREVIOUS STATE IS 0, ALTHOUGH IT OF
 R0022 COURSE SHOULD BE. ONE CASE WHICH MAY BE SEEN TO EVADE PROTECTION IS THE OCCURRENCE OF A RESTART AFTER UPDATING
 R0024 ONE OR BOTH DAP MASK-WORDS BUT BEFORE UPDATING 'PVALVEST', COUPLED WITH A CHANGE IN THE VALVE-BIT BACK TO ITS
 R0026 FORMER STATE. THE CONSEQUENCE OF THIS IS THAT THE NEXT ENTRY WOULD NOT SEE THE CHANGE INCOMPLETELY INCCRP-
 R0028 ORATED BY THE LAST PASS (BECAUSE IT WENT AWAY AT JUST THE RIGHT TIME), BUT THE DAP MASK-WORDS WILL BE INCORRECT.
 R0030 THIS COMBINATION OF EVENTS SEEMS QUITE REMOTE, BUT NOT IMPOSSIBLE UNLESS THE CREW OPERATES THE SWITCHES AT HALF-
 R0032 SECOND INTERVALS OR LONGER. IN ANY EVENT, A DISAGREEMENT BETWEEN REALITY AND THE DAP MASKS WILL BE CURED IF
 R0034 THE MISINTERPRETED SWITCH IS REVERSED AND THEN RESTORED TO ITS CORRECT POSITION (SLOWLY).

R0036 CALLING SEQUENCE:

R0037 TCF PCSMCNIT (IN INTERRUPT MODE, EVERY 480 MS.)

R0038 EXIT: TCF PCSMCNEX (ALL PATHS EXIT VIA SUCH AN INSTRUCTION)

0039 REF 7 LAST 190 5270 PCSMCNEX EQUALS RESUME

R0040 ERASABLE INITIALIZATION REQUIRED:

R0041 VIA FRESH START: PVALVEST = +0 (ALL JETS ENABLED)

R0042 CH5MASK, CH6MASK = +0 (ALL JETS OK)

R0043 OUTPUT: CH5MASK & CH6MASK UPDATED (1'S WHERE JETS NOT TO BE USED, IN CHANNEL 5 & 6 FORMAT)

R0045 PVALTEST UPDATED (1'S WHEN VALVE CLOSURES HAVE BEEN TRANSLATED INTO CH5MASK & CH6MASK; CHAN 32 FORMAT)

R00465 JOB TO DO 1/ACCS.

R0047 DEEPS: A, L, G AND DEBRIS OF MOVAC.

R0048 SUBROUTINE CALLED: MOVAC.

0052 REF 1 1257 EBANK= CH5MASK

0055 23,2000 BANK 23

0060 REF 1 06,2000 SETLOC PCSMCNT

0061 06,3164 BANK

L RCS FAILURE MONITOR

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0062 REF I CCLN1# \$\$/T4PCS

00625 REF 1 06,3164 RCSCMNIT EQUALS RCSCMON

0063 REF 6 LAST 175 06,3164 4 4755 0 RCSCMN CS ZERO

0064 06,3165 0 3006 I EXTEND

0065 REF 2 LAST 159 06,3166 06 032 0 XOR CHAN32 PICK UP + INVERT INVERTED CHANNEL 32.

0066 REF 1 06,3167 7 4357 0 MASK LCH8 KEEP JET-FAIL PITS ONLY.

0067 REF 8 LAST 182 06,3170 54 002 I TS G

0068 REF 1 06,3171 4 1273 1 CS PVALVEST

0069 REF 9 LAST 192 06,3172 7 0002 1 MASK G FORM EC + FC.

0070 REF 4 LAST 186 06,3173 54 001 I TS L (P = PREVIOUS ISOLATION VALVE STATE,

0071 REF 10 LAST 192 06,3174 4 0002 1 CS G C = CURRENT VALVE STATE (CH 32)).

0072 REF 2 LAST 192 06,3175 7 1273 1 MASK PVALVEST

0073 REF 5 LAST 192 06,3176 26 001 1 ADS L RESULT NZ INDICATES ACTION REQUIRED.

0074 06,3177 0 0006 1 EXTEND

0075 REF I 06,3200 1 5270 0 PZF RCSCMDEF CLIT IF NO ACTION REQUIRED.

0076 06,3201 0 0006 1 EXTEND

0077 REF 16 LAST 174 06,3202 7 4745 1 MF BIT7 MOVE BITS 8 - 1 OF A TO 14 - 7 OF L.

0078 REF 6 LAST 192 06,3203 56 001 0 XCF L ZERO TO L IN THE PROCESS.

0079 REF 7 LAST 192 06,3204 24 001 0 -3 INCF L

0080 06,3205 6 0000 1 DCBLF BOUND TO GET OVERFLOW IN THIS LOOP,

0081 06,3206 54 000 0 DVSX SINCE WE ASSURED INITIAL NZ IN A.

0082 06,3207 1 3204 0 TCF -3

0083 REF 8 LAST 192 06,3210 50 001 0 INDEX L

0084 REF 16 LAST 165 06,3211 3 4743 0 CA BIT8 -1 SAVE THE RELEVANT BIT (8 - 1).

0085 REF 11 LAST 192 06,3212 54 002 1 TS G

0086 REF 3 LAST 192 06,3213 7 1273 1 MASK PVALVEST LOCK AT PREVIOUS VALVE STATE BIT.

0087 REF 25 LAST 188 06,3214 10 000 0 CCS A

0088 REF 1 06,3215 1 3201 0 TCF VOPENED THE VALVE HAS JUST BEEN OPENED.

0089 REF 2 LAST 191 06,3216 4 1257 1 CS CH5MASK THE VALVE HAS JUST BEEN CLOSED.

0090 REF 9 LAST 192 06,3217 50 001 0 INDEX L

0091 REF I 06,3220 7 3250 1 MASK 5FAILTAB

0092 REF 3 LAST 192 06,3221 27 257 1 ADS CH5MASK SET INHIBIT BIT FOR CHANNEL 5 JET.

0093 REF 1 06,3222 4 1260 0 CS CH6MASK

0094 REF 10 LAST 192 06,3223 50 001 0 INDEX L

0095 REF 1 06,3224 7 3260 1 MASK 6FAILTAB

0096 REF 2 LAST 192 06,3225 27 260 0 ADS CH6MASK SET INHIBIT BIT FOR CHANNEL 6 JET.

0097 REF 12 LAST 192 06,3226 3 0002 0 CA G

0098 REF 4 LAST 192 06,3227 27 273 1 ADS PVALVEST RECCRE ACTION TAKEN.

0099 REF I 06,3230 1 3244 1 TCF 1/ACCFIX SET UP 1/ACCFIX AND EXIT.

L PCS FAILURE MONITOR

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0100	REF	11	LAST	192	06,3231	50 001 0	VCOPENED	INDEX	L	A VALVE HAS JUST BEEN OPENED.
0101	REF	2	LAST	192	06,3232	4 3250 1		CS	5FAILTAB	
0102	REF	4	LAST	192	06,3233	7 1257 1		MASK	CH5MASK	
0103	REF	5	LAST	193	06,3234	55 257 1		TS	CH5MASK	REMOVE INHIBIT BIT FOR CHANNEL 5 JET.
0104	REF	12	LAST	193	06,3235	50 001 0		INDEX	L	
0105	REF	2	LAST	192	06,3236	4 3260 1		CS	6FAILTAB	
0106	REF	3	LAST	192	06,3237	7 1260 0		MASK	CH6MASK	
0107	REF	4	LAST	193	06,3240	55 260 0		TS	CH6MASK	REMOVE INHIBIT BIT FOR CHANNEL 6 JET.
0108	REF	13	LAST	192	06,3241	4 0002 1		CS	C	
0109	REF	5	LAST	192	06,3242	7 1273 1		MASK	PVALVEST	
0110	REF	6	LAST	193	06,3243	55 273 1		TS	PVALVEST	RECORD ACTION TAKEN.
0111	REF	1			06,3244	3 7720 0	1/ACCFIX	CAF	PRI027	SET UP 1/ACCS SC THAT THE SWITCH CURVES
0112	REF	2	LAST	199	06,3245	0 5072 1		TC	NCVAC	FOR TJETLAW CAN BE MODIFIED IF CH5MASK
0113	REF	4	LAST	134	06,1537			EBANK=	ACSC	HAS BEEN ALTERED.
0114	REF	1			06,3246	03644 1		ZCADR	1/ACCFIX	
0114	REF	1			06,3247	42106 0				
0115	REF	2	LAST	192	06,3250	1 5270 0		TCF	PCSMCNEX	EXIT.
0117					06,3247			5FAILTAB	EQUALS -1	CH 5 JET BIT CORRESPONDING TO CH 32 BIT:
0118					06,3251	00040 0		CCT	00040	8
0119					06,3252	00020 0		CCT	00020	7
0120					06,3253	00100 0		CCT	00100	6
0121					06,3254	00200 0		CCT	00200	5
0122					06,3255	00010 0		CCT	00010	4
0123					06,3256	00001 0		CCT	00001	3
0124					06,3257	00004 0		CCT	00004	2
0125					06,3260	00002 0		CCT	00002	1
0126					06,3257			6FAILTAB	EQUALS -1	CH 6 JET BIT CORRESPONDING TO CH 32 BIT:
0127					06,3261	00010 0		CCT	00010	8
0128					06,3262	00020 0		CCT	00020	7
0129					06,3263	00004 0		CCT	00004	6
0130					06,3264	00200 0		CCT	00200	5
0131					06,3265	00001 0		CCT	00001	4
0132					06,3266	00002 0		CCT	00002	3
0133					06,3267	00040 0		CCT	00040	2
0134					06,3270	00100 0		CCT	00100	1

L DOWNLINK LISTS

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0001 22,2104 BANK 22
 0002 REF 1 05,2000 SETLEC DOWNTELM
 0003 05,2155 BANK

0004 REF 2 LAST 155 0340 FBANK= DOWNTELEF

0005 SPECIAL DOWNLINK OF CODES

OP CODE	ADDRESS(EXAMPLE)	SENDS..	BIT 15	BITS 14-12	BITS 11
0006					-0
0007					
0008					--
0009					
0010	10NADR TIME2	(2 AGC WDS)	0	0	ECADR
0011	20NADR TEPHEM	(4 AGC WDS)	0	1	FCADR
0012	30NADR VGEODEY	(6 AGC WDS)	0	2	ECADR
0013	40NADR STATE	(8 AGC WDS)	0	3	ECADR
0014	50NADR UPRUFF	(10AGC WDS)	0	4	ECADR
0015	60NADR DSPTAE	(12AGC WDS)	0	5	ECADR
0016	DNCHAN 30	CHANNELS	0	7	CHANNEL
0017					ADDRESS
0018	DNPTR NEXTLIST	POINTS TO NEXT	0	6	ADPES
0019		LIST.			

0020 DOWNLIST FORMAT DEFINITIONS AND RULES-

0021 1. END OF A LIST = -XCNADR (X = 1 TO 6), -DNPTR, OR -DNCHAN.

0022 2. SNAPSHOT SUBLIST = LIST WHICH STARTS WITH A -10NADR.

0023 3. SNAPSHOT SUBLIST CAN ONLY CONTAIN 10NADRS.

0024 4. TIME2 10NADR MUST BE LOCATED IN THE CONTROL LIST OF A DOWNLIST.

0025 5. ERASABLE DOWN TELEMETRY WORDS SHOULD BE GROUPED IN SEQUENTIAL

0026 LOCATIONS AS MUCH AS POSSIBLE TO SAVE STORAGE USED BY DOWNLINK LISTS.

0027 REF 1 COUNT# #1/DLIST
 0028 0007 ERASZERC EQUALS 7
 0029 REF 1 0007 UNKNOWN EQUALS ERASZERC
 0030 REF 2 LAST 154 0007 SPAPE EQUALS ERASZERC
 0032 05,2065 77340 0 LCWIDCCD OCT 77340 USE SPAPE TO INDICATE AVAILABLE SPACE
 LCW ID CODE

0033 REF 1 05,2172 NCMONLIST EQUALS LMCSTADL PPFESH START AND ECST P27 DOWNLIST

0034 REF 1 05,2407 AGSLIST EQUALS LMGSTDL

0035 REF 2 LAST 194 05,2417 UPDNLIST EQUALS LMGSTDL UPDATE FRECFAN (P27) DOWNLIST

L DOWNLINK LISTS

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P0036 LM ORBITAL MANEUVERS LIST

R0037 ----- CONTROL LIST -----

0038				05,2066		LMCRBMD1	EQUALS	SEND 10 BY SPECIAL CODING
0039	REF	1		05,2066	32127 1	DNPTR	LMCRBMD1	COLLECT SNAPSHCT
0040	REF	3	LAST	194	05,2067	24340 0	6DNADR DNTMBUFF	SEND SNAPSHCT
0041	REF	1			05,2070	03451 1	1CNACR CELLT4	CELLT4,+1
0042	REF	2	LAST	141	05,2071	13443 0	3DNADR RTARG	RTARG,+1...+5
0043	REF	1			05,2072	02256 1	1CNACR FLEV	ELEV,+1
0044	REF	1			05,2073	01341 0	1DNACR TEVENT	TEVENT,+1
0045	REF	1			05,2074	25733 1	6DNADR REFSMMAT	REFSMMAT+0...+110
0046	REF	1			05,2075	03633 1	1DNACR TCSI	TCSI,+1
0047	REF	1			05,2076	12266 0	3DNACR DELVEET1	DELVEET1+0...+5
0048	REF	2	LAST	144	05,2077	13700 1	3DNACR VGTIG	VGTIG+0...+5
0049	REF	2	LAST	107	05,2100	01325 0	1DNACR CNLRVEL2	CNLRVEL2,CNLRALT
0050	REF	1			05,2101	03630 1	1DNADR TPASS4	TPASS4,+1
0051	REF	1			05,2102	32136 1	DNPTR LMORBM02	COMMON DATA
0052	REF	1			05,2103	00024 1	1DNADR TIME2	TIME2/1
0053	REF	1			05,2104	32145 0	DNPTR LMORBM03	COLLECT SNAPSHCT
0054	REF	4	LAST	195	05,2105	24340 0	6DNACR DNTMBUFF	SEND SNAPSHCT
0055	REF	1			05,2106	32154 0	DNPTR LMORBM04	COMMON DATA
0056	REF	1			05,2107	07115 0	2CNACR POSTORKU	POSTORKU,NEGTCRKU,POSTCRKV,NEGTCRKV
0058	REF	1			05,2110	00007 0	1CNACR SPARE	
0059	REF	1			05,2111	01776 0	1DNADR TCDH	TCDH,+1
0060	REF	1			05,2112	12274 0	3CNACR DELVEET2	DELVEET2+0...+5
0061	REF	1			05,2113	03635 1	1DNADR TTPI	TTPI,+1
0062	REF	1			05,2114	12365 1	3DNACR DELVEET3	DELVEET3+0...+5
0063	REF	2	LAST	107	05,2115	01330 0	1CNACR CNRRANGE	CNRRANGE,DNRRDOT
0065	REF	2	LAST	107	05,2116	05333 1	2DNACR CNLRVELX	CNLRVELX,CNLRVELY,CNLRVELZ,CNLRALT
0066	REF	1			05,2117	03577 1	1CNACR DIFFALT	DIFFALT,+1
0067	REF	1			05,2120	01326 1	1DNACR LEMMASS	LEMMASS,CSMMASS
0068	REF	32	LAST	181	05,2121	01277 1	1DNADR INOCES30	INOCES30,INOCES33
0069	REF	1			05,2122	03441 0	1CNACR TIG	TIG,+1
0070	REF	1			05,2123	32157 0	DNPTR LMORBM05	COMMON DATA
0071	REF	1			05,2124	32170 0	DNPTR LMORBM06	COMMON DATA
0072	REF	2	LAST	195	05,2125	00007 0	1CNACR SPARE	FORMERLY PIF
0073	REF	2	LAST	148	05,2126	74261 1	-1DNACR TGC	TGC,+1

R0074 ----- SUB-LISTS -----

0075	REF	2	LAST	121	05,2127	76056 0	LMCRBMD1-1DNACR R-CTHER +2	R-CTHER+2,+3	SNAPSHOT
0076	REF	3	LAST	195	05,2130	01723 0	1DNACR R-CTHER +4	R-CTHER+4,+5	
0077	REF	2	LAST	121	05,2131	01725 0	1DNACR V-CTHER	V-CTHER,+1	
0078	REF	3	LAST	195	05,2132	01727 1	1DNACR V-CTHER +2	V-CTHER+2,+3	
0079	REF	4	LAST	195	05,2133	01731 0	1CNACR V-OTHER +4	V-CTHER+4,+5	
0080	REF	1			05,2134	01570 1	1CNACR T-CTHER	T-OTHER,+1	
0081	REF	4	LAST	195	05,2135	76060 0	-1DNACR R-CTHER	R-CTHER+0,+1	
0082	REF	1			05,2136	04320 1	LMORBM02 2CNACR REDOCTR	REDOCTR,THETAC,+1,+2	COMMON DATA

L DOWNLINK LISTS

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0083	REF	1		05,2137	01432 0	1DNADR RSPBC	RSPBC,+1
0084	REF	5	LAST	130	05,2140	2DNADR CMGAF	CMGAF,CMGAG,CMGAR,GARBAGE
0085	REF	4	LAST	137	05,2141	2DNADR CDUXD	CDUXD,CDLYC,CDUZD,GARBAGE
0086	REF	3	LAST	190	05,2142	2DNADR CDLX	CDLX,CDLY,CDLZ,CDLT
0087	REF	16	LAST	96	05,2143	6DNADR STATE	STATE+0...+110 (FLAGWORDS)
0088	REF	13	LAST	181	05,2144	-6DNADR DSPTAB	DSPTAB TABLES
0089	REF	1		05,2145	76556 0	LMCREM03-1DNADR RN +2	RN +2,+3
0090	REF	2	LAST	196	05,2146	1DNADR RN +4	RN +4,+5
0091	REF	1		05,2147	01225 0	1DNADR VN	VN,+1
0092	REF	2	LAST	196	05,2150	1DNADR VN +2	VN +2,+3
0093	REF	3	LAST	196	05,2151	1DNADR VN +4	VN +4,+5
0094	REF	1		05,2152	01233 1	1DNADR PIPTIME	PIPTIME,+1
0095	REF	3	LAST	196	05,2153	-1DNADR RN	RN,+1
0096	REF	3	LAST	135	05,2154	2DNADR CMGAFD	CMGAFD,CMGAGD,CMGAR, GARBAGE
0097	REF	1		05,2155	10372 0	3DNADR CADRFLSH	CADRFLSH,+1,+2,FAILREG,+1,+2
0098	REF	14	LAST	188	05,2156	-1DNADR RADMCDES	RADMCDES,CARBCCLS COMMON DATA
0099	REF	6	LAST	196	05,2157	2DNADR CMGAF	CMGAF,CMGAG,CMGAR,GARBAGE
0100	REF	5	LAST	196	05,2160	2DNADR CDUXD	CDUXD,CDLYC,CDUZD,GARBAGE
0101	REF	4	LAST	196	05,2161	2DNADR CELX	CDLX,CDLY,CDUZ,CDUT
0102	REF	1		05,2162	03024 1	1DNADR ALPHAQ	ALPHAQ,ALPHAR COMMON DATA
0103	REF	1		05,2163	03113 1	1DNADR PESTCRKP	PESTCRKP,NECTCRKP
0104				05,2164	34011 0	DNCHAN 11	CHANNELS11,12
0105				05,2165	34013 1	DNCHAN 13	CHANNELS13,14
0106				05,2166	34030 0	DNCHAN 30	CHANNELS30,31
0107				05,2167	43745 0	-DNCHAN 32	CHANNELS32,33
0108	REF	2	LAST	148	05,2170	1DNADR PIPTIME1	PIPTIME,+1
0109	REF	4	LAST	95	05,2171	-3DNADR DELV	DELV+0...+5

R0110

L DOWNLINK LISTS

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P0111 LM CCAST AND ALIGNMENT DOWNLIST

R0112 ----- CONTROL LIST -----

0113					05,2172		LMCSTA01 EQUALS	SEND ID BY SPECIAL CODING
0114	REF	1			05,2172	32127 1	DNPTR LMCSTA01	COLLECT SNAPSHOT
0115	REF	5	LAST	195	05,2173	24340 0	6DNADR DNTMBUFF	SEND SNAPSHOT
0116	REF	1			05,2174	02020 1	1DNADR AGSK	AGSK,+1
0117	REF	2	LAST	125	05,2175	02774 1	1DNADR TALIGN	TALIGN,+1
0118	REF	2	LAST	195	05,2176	07115 0	2DNADR PCSTCRKU	PCSTCRKU,NEGTCRKU,POSTCRKV,NEGTCRKV
0120	REF	3	LAST	195	05,2177	01330 0	1DNADR DNRRANGE	DNRRANGE,DNRRCCT
0121	REF	2	LAST	195	05,2210	01341 0	1DNADR TEVENT	TEVENT,+1
0122	REF	2	LAST	195	05,2201	25733 1	6DNADR REFSMMAT	REFSMMAT+0...+11D
0123	REF	1			05,2202	00734 1	1DNADR ACTCODE	ACTCODE,GARBAGE
0124	REF	1			05,2203	12022 1	3DNADR RLS	RLS+0...+5
0125	REF	3	LAST	195	05,2204	05333 1	2DNADR DNLRVELX	DNLRVELX,DNLRVELY,DNLRVELZ,DNLRALT
0126	REF	3	LAST	195	05,2205	13700 1	3DNADR VGTIG	VGTIGX,Y,Z
0127	REF	1			05,2206	32136 1	DNPTR LMCSTA02	COMMON DATA
0128	REF	2	LAST	195	05,2207	00024 1	1DNADR TIME2	TIME2/1
0129	REF	1			05,2210	32145 0	DNPTR LMCSTA03	COLLECT SNAPSHOT
0130	REF	6	LAST	197	05,2211	24340 0	6DNADR DNTMBUFF	SEND SNAPSHOT
0131	REF	1			05,2212	32154 0	DNPTR LMCSTA04	COMMON DATA
0132	REF	1			05,2213	32226 0	DNPTR LMCSTA07	COMMON DATA
0133	REF	4	LAST	197	05,2214	05233 1	2DNADR DNLRVELX	DNLRVELX,DNLRVELY,DNLRVELZ,DNLRALT
0134	REF	1			05,2215	04036 0	2DNADR CCUS	CCUS,PIPAZ,PIPAY,PIPAZ
0135	REF	2	LAST	96	05,2216	00112 0	1DNADR LASTXCMC	LASTXCMC,LASTXCMC
0136	REF	2	LAST	195	05,2217	01326 1	1DNADR LEMMASS	LEMASS,CSMASS
0137	REF	33	LAST	195	05,2220	01277 1	1DNADR IMODES30	IMODES30,IMODES33
0138	REF	2	LAST	195	05,2221	03441 0	1DNADR TIG	TIG,+1
0139	REF	1			05,2222	32157 0	DNPTR LMCSTA05	COMMON DATA
0140	REF	14	LAST	196	05,2223	52755 1	-6DNADR DSPTAB	DSPTAB+0...+11D TABLE

R0141 ----- SUB-LISTS -----

0142	REF	2	LAST	195	05,2127		LMCSTA01 EQUALS LMORBM01	COMMON DOWNLIST DATA
0143	REF	2	LAST	195	05,2136		LMCSTA02 EQUALS LMORBM02	COMMON DOWNLIST DATA
0144	REF	2	LAST	195	05,2145		LMCSTA03 EQUALS LMCPBM03	COMMON DOWNLIST DATA
0145	REF	2	LAST	195	05,2154		LMCSTA04 EQUALS LMCPBM04	COMMON DOWNLIST DATA
0146	REF	2	LAST	195	05,2157		LMCSTA05 EQUALS LMORBM05	COMMON DOWNLIST DATA
0147	REF	1			05,2224	05700 0	LMCSTA06 2DNADR X789	X789+0...+3 COMMON DATA
0148	REF	3	LAST	197	05,2225	77665 1	-1DNADR LASTXCMC	LASTXCMC,LASTXCMC
0149	REF	2	LAST	124	05,2226	12737 1	LMCSTA07 3DNADR OGC	OGC,+1,OGC,+1,MGC,+1 COMMON DATA
0150	REF	2	LAST	125	05,2227	02755 1	1DNADR BESTI	BESTI,BESTJ
0151	REF	2	LAST	125	05,2230	12760 0	3DNADR STARS AV1	STARS AV1+0...+5
0152	REF	3	LAST	129	05,2231	65011 1	-3DNADR STARS AV2	STARS AV2+0...+5

L DOWNLINK LISTS

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R0153

L DOWNLINK LISTS

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R0154 LM RENDEZVOUS AND PRE-THRUST DOWNLIST

R0155 ----- CONTROL LIST -----

REF	1	7	1	8	2	3	1	2	2	1	3	1	9	1	3	4	2	2	2	2	4	3	34	3	1	5	1	2	1	6
0156	REF	1																												
0157	REF	1	LAST	197	05,2232	32127	1																							
0158	REF	7	LAST	197	05,2233	24340	0																							
0159	REF	1			05,2234	32276	0																							
0160	REF	8	LAST	199	05,2235	14340	0																							
0161	REF	2	LAST	195	05,2236	03451	1																							
0162	REF	3	LAST	195	05,2237	13443	0																							
0163	REF	1			05,2240	13433	1																							
0164	REF	2	LAST	195	05,2241	03632	1																							
0165	REF	2	LAST	195	05,2242	12266	0																							
0166	REF	3	LAST	195	05,2243	00007	0																							
0167	REF	2	LAST	195	05,2244	02630	1																							
0168	REF	1			05,2245	32224	1																							
0169	REF	1			05,2246	32136	1																							
0170	REF	3	LAST	197	05,2247	00024	1																							
0171	REF	1			05,2250	32145	0																							
0172	REF	9	LAST	199	05,2251	24340	0																							
0173	REF	1			05,2252	32154	0																							
0174	REF	3	LAST	197	05,2253	07115	0																							
0176	REF	4	LAST	199	05,2254	00007	0																							
0177	REF	2	LAST	195	05,2255	01776	0																							
0178	REF	2	LAST	195	05,2256	12274	0																							
0179	REF	2	LAST	195	05,2257	03635	1																							
0180	REF	2	LAST	195	05,2260	12365	1																							
0181	REF	2	LAST	195	05,2261	02256	1																							
0182	REF	2	LAST	197	05,2262	04036	0																							
0183	REF	4	LAST	197	05,2263	00112	0																							
0184	REF	3	LAST	197	05,2264	01226	1																							
0185	REF	34	LAST	197	05,2265	01277	1																							
0186	REF	3	LAST	197	05,2266	03441	0																							
0187	REF	1			05,2267	32157	0																							
0188	REF	5	LAST	199	05,2270	00007	0																							
0189	REF	1			05,2271	03620	0																							
0190	REF	1			05,2272	03466	0																							
0191	REF	2	LAST	195	05,2273	03577	1																							
0192	REF	1			05,2274	02347	0																							
0193	REF	6	LAST	199	05,2275	77770	1																							

R0194 ----- SUB-LISTS -----

0195	REF	3	LAST	197	05,2127		LMREND01	EQUALS	LMORBM01	COMMON DOWNLIST DATA
0196	REF	2	LAST	197	05,2136		LMREND02	EQUALS	LMCREM02	COMMON DOWNLIST DATA
0197	REF	3	LAST	197	05,2145		LMREND03	EQUALS	LMCRBM03	COMMON DOWNLIST DATA

L DOWNLINK LISTS

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0198 REF 3 LAST 197 05,2154 LMPEND04 EQUALS LMPBPM04 COMMON DOWNLIST DATA

0199 REF 3 LAST 197 05,2157 LMPEND05 EQUALS LMPBPM05 COMMON DOWNLIST DATA

0200 REF 1 05,2224 LMPEND06 EQUALS LMPSTAD06 COMMON DOWNLIST DATA

0201 REF 1 05,2276 74320 0 LMPEND07-1DNADR AIG AIG,APG SNAPSHOT

0202 REF 1 05,2277 03461 1 1DNADR AIG AIG,TRKMKCNT

0203 REF 2 LAST 147 05,2300 03752 1 1DNADR TANGNE TANGNE,+1

0204 REF 2 LAST 147 05,2301 03754 1 1DNADR MKTIME MKTIME,+1

0205 REF 2 LAST 147 05,2302 74017 1 -1DNADR RANGRECT DNPRANGE,DNRRECT

R0206

L DOWNLINK LISTS

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P0277 LM DESCENT AND ASCENT DOWNLIST

R0208 ----- CONTROL LIST -----

0209				05,2303		LMDSASDL EQUALS	SEND ID BY SPECIAL CODING
0210	REF	1		05,2303	32341 0	DNPTR LMDSAS07	COLLECT SNAPS+CT
0211	REF	1		05,2304	32355 0	DNPTR LMDSAS08	SEND SNAPSHOT
0212	REF	3	LAST 197	05,2305	01341 0	1DNADR TEVENT	TEVENT,+1
0213	REF	2	LAST 137	05,2306	13253 1	2DNADR UNFC/2	UNFC/2+0...+5
0214	REF	2	LAST 153	05,2307	13645 1	3DNADR VGVECT	VGVECT+0...+5
0215	REF	2	LAST 150	05,2310	03642 1	1DNADR TTF/8	TTF/8,+1
0216	REF	2	LAST 151	05,2311	03664 0	1DNADR DELTAH	DELTAH,+1
0217	REF	2	LAST 157	05,2312	12022 1	3DNADR RLS	RLS+0...+5
0220	REF	2	LAST 120	05,2313	02276 0	1DNADR ZDCTD	ZDCTD,+1
0221	REF	1		05,2314	32224 1	DNPTR LMDSAS09	COMMON DATA
0222	REF	1		05,2315	32136 1	DNPTR LMDSAS02	COMMON DATA
0223	REF	4	LAST 199	05,2316	00024 1	1DNADR TIME2	TIME2/1
0224	REF	1		05,2317	32145 0	DNPTR LMDSAS03	COLLECT SNAPSHOT
0225	REF	1	LAST 199	05,2320	24340 0	6DNADR DNTMBUFF	SEND SNAPS+CT
0226	REF	1		05,2321	32154 0	DNPTR LMDSAS04	COMMON DATA
0227	REF	4	LAST 199	05,2322	07115 0	2DNADR POSTCRKU	POSTCRKU,NEGTORCV,POSTCRKV,NEGTORCV
0229	REF	2	LAST 122	05,2323	12626 0	3DNADR RGL	RGL+0...+5
0230	REF	2	LAST 150	05,2324	13626 1	3DNADR VGL	VGL+0...+5
0231	REF	2	LAST 150	05,2325	13634 1	3DNADR LAND	LAND+0...+5
0232	REF	2	LAST 120	05,2326	02262 0	1DNADR AT	AT,+1
0233	REF	2	LAST 122	05,2327	02400 1	1DNADR TLAND	TLAND,+1
0234	REF	2	LAST 150	05,2330	03615 0	1DNADR FC	FC,GARBAGE
0235	REF	5	LAST 199	05,2331	00112 0	1DNADR LASTYCMD	LASTYCMD,LASTXCMD
0236	REF	4	LAST 199	05,2332	01326 1	1DNADR LEMPASS	LEMPASS,CSMPASS
0237	REF	35	LAST 199	05,2333	01277 1	1DNADR IMCDES30	IMCDES30,IMCDES33
0238	REF	4	LAST 199	05,2334	03441 0	1DNADR TIC	TIC,+1
0239	REF	1		05,2335	32157 0	DNPTR LMDSAS05	COMMON DATA
0240	REF	1		05,2336	32170 0	DNPTR LMDSAS06	COMMON DATA
0241	REF	2	LAST 150	05,2337	03614 1	1DNADR PSEUDCC55	PSEUDCC55,GARBAGE
0242	REF	3	LAST 155	05,2340	74324 1	-1DNADR TTCGC	TTCGC,+1

R0243 ----- SUB-LISTS -----

0244	REF	4	LAST 199	05,2136		LMDSAS02 EQUALS LMCRBM02	COMMON DOWNLIST DATA
0245	REF	4	LAST 199	05,2145		LMDSAS03 EQUALS LMCRBM03	COMMON DOWNLIST DATA
0246	REF	4	LAST 200	05,2154		LMDSAS04 EQUALS LMCRBM04	COMMON DOWNLIST DATA
0247	REF	4	LAST 200	05,2157		LMDSAS05 EQUALS LMCRBM05	COMMON DOWNLIST DATA
0248	REF	2	LAST 195	05,2170		LMDSAS06 EQUALS LMCRBM06	COMMON DOWNLIST DATA
0249	REF	2	LAST 120	05,2341	75441 1	LMDSAS07-1DNADR LRZCUDL	LRZCUDL,GARBAGE
0250	REF	2	LAST 150	05,2342	03651 0	1DNADR VSELECT	VSELECT,GARBAGE
0251	REF	1		05,2343	02337 1	1DNADR LRVTIMECL	LRVTIMECL,+1

SNAPSHOT

L DOWNLINK LISTS

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0252	REF	2	LAST	150	05,2344	03652 0	1DNADR VMEAS	VMEAS,+1
0253	REF	3	LAST	200	05,2345	03754 1	1DNADR MKTIME	MKTIME, +1
0254	REF	2	LAST	150	05,2346	02654 0	1DNADR HMEAS	HMEAS,+1
0255	REF	3	LAST	152	05,2347	03756 0	1DNADR RM	RM,+1
0256	REF	2	LAST	200	05,2350	03457 1	1DNADR AIG	AIG,AME
0257	REF	2	LAST	200	05,2351	03461 1	1DNADR ACG	ACG,TRKMKCNT
0258	REF	3	LAST	200	05,2352	03752 1	1DNADR TANGNB	TANGNB,+1
0259	REF	4	LAST	202	05,2353	03754 1	1DNADR MKTIME	MKTIME,+1
0260	REF	2	LAST	120	05,2354	75443 0	-1DNADR LRXCOLDL	LRXCOLDL,LRXCOLDL

0261	REF	11	LAST	201	05,2355	24340 0	LMCSAS08 6DNADR DNTMBUFF	SEND SNAPSCT
0262	REF	12	LAST	202	05,2356	57423 0	-5DNADR DNTMBUFF +120	

0263	REF	2	LAST	200	05,2224		LMCSAS05 EQUALS LMCSTA06	COMMON DOWNLIST DATA
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R0264

L DOWNLINK LISTS

USER'S PAGE NO. 10

EO S4

R0265 LM LUNAR SURFACE ALIGN DOWNLIST

R0266 ----- CONTROL LIST -----

0267					05,2357		LMLSAL01 EQUALS	SEND ID BY SPECIAL CODING
0268	REF	1			05,2357	32127 1	DNPTR LMLSAL01	COLLECT SNAPSHOT
0269	REF	13	LAST	202	05,2360	24340 0	6DNADR DNTMBUFF	SEND SNAPSHOT
0270	REF	1			05,2361	32276 0	DNPTR LMLSAL07	COLLECT SNAPSHOT
0271	REF	14	LAST	203	05,2362	14340 0	4DNADR DNTMBUFF	SEND SNAPSHOT
0272	REF	3	LAST	197	05,2363	02774 1	1DNADR TALIGN	TALIGN,+1
0273	REF	3	LAST	197	05,2364	25733 1	6DNADR REFSMMAT	REFSMMAT+0...+11C
0274	REF	2	LAST	117	05,2365	26236 1	6DNADR YNBSAV	YNBSAV+0...+5,2NBSAV+C...+5
0275	REF	1			05,2366	32224 1	DNPTR LMLSAL08	COMMON DATA
0276	REF	1			05,2367	32136 1	DNPTR LMLSAL02	COMMON DATA
0277	REF	5	LAST	201	05,2370	00024 1	1DNADR TIME2	TIME/1
0278	REF	1			05,2371	32145 0	DNPTR LMLSAL03	COLLECT SNAPSHOT
0279	REF	15	LAST	203	05,2372	24340 0	6DNADR DNTMBUFF	SEND SNAPSHOT
0280	REF	1			05,2373	32154 0	DNPTR LMLSAL04	COMMON DATA
0281	REF	1			05,2374	32226 0	DNPTR LMLSAL09	COMMON DATA
0282	REF	4	LAST	117	05,2375	12230 0	3DNADR GSAV	GSAV+0...+5
0283	REF	2	LAST	197	05,2376	02020 1	1DNADR AGSK	AGSK,+1
0284	REF	6	LAST	201	05,2377	00112 0	1DNADR LASTYCMD	LASTYCMD, LASTXCMC
0285	REF	5	LAST	201	05,2400	01326 1	1DNADR LEMMASS	LEMMASS,CSMMASS
0286	REF	36	LAST	201	05,2401	01277 1	1DNADR IMCDES30	IMCDES30,IMCDES33
0287	REF	5	LAST	201	05,2402	03441 0	1DNADR TIG	TIG,+1
0288	REF	1			05,2403	32157 0	DNPTR LMLSAL05	COMMON DATA
0289	REF	1			05,2404	32170 0	DNPTR LMLSAL06	COMMON DATA
0290	REF	7	LAST	199	05,2405	00007 0	1DNADR SPARE	
0291	REF	8	LAST	203	05,2406	77770 1	-1DNADR SPARE	

R0292 ----- SUB-LISTS -----

0293	REF	4	LAST	199	05,2127		LMLSAL01 EQUALS LNCREMO1	COMMON DOWNLIST DATA
0294	REF	5	LAST	201	05,2126		LMLSAL02 EQUALS LNCREMO2	COMMON DOWNLIST DATA
0295	REF	5	LAST	201	05,2145		LMLSAL03 EQUALS LNCREMO3	COMMON DOWNLIST DATA
0296	REF	5	LAST	201	05,2154		LMLSAL04 EQUALS LNCREMO4	COMMON DOWNLIST DATA
0297	REF	5	LAST	201	05,2157		LMLSAL05 EQUALS LNCREMO5	COMMON DOWNLIST DATA
0298	REF	3	LAST	201	05,2170		LMLSAL06 EQUALS LNCREMO6	COMMON DOWNLIST DATA
0299	REF	2	LAST	199	05,2276		LMLSAL07 EQUALS LNCREMO7	COMMON DOWNLIST DATA
0300	REF	3	LAST	202	05,2224		LMLSAL08 EQUALS LNCSTAG6	COMMON DOWNLIST DATA
0301	REF	2	LAST	197	05,2226		LMLSAL09 EQUALS LNCSTAG7	COMMON DOWNLIST DATA

L DOWNLINK LISTS

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R0302

L DOWNLINK LISTS

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P0303 LM AGC INITIALIZATION AND UPDATE DOWNLIST

R0304 ----- CONTROL LIST -----

0305					05,2407		LMAGSICL	EQUALS	SEND IC BY SPECIAL CODING
0306	REF	2	LAST	118	05,2407	12200 0	3DNADR	AGSBUFF +0	AGSBUFF+0...+5
0307	REF	3	LAST	205	05,2410	02214 1	1DNADR	AGSBUFF +12C	AGSBUFF+12C,GARBAGE
0308	REF	4	LAST	205	05,2411	12201 1	3DNADR	AGSBUFF +1	AGSBUFF+1...+6
0309	REF	5	LAST	205	05,2412	02215 0	1DNADR	AGSBUFF +13C	AGSBUFF+13C,GARBAGE
0310	REF	6	LAST	205	05,2413	12206 0	2DNADR	AGSBUFF +6	AGSBUFF+6...+11
0311	REF	7	LAST	205	05,2414	02214 1	1DNADR	AGSBUFF +12C	AGSBUFF+12C,GARBAGE
0312	REF	8	LAST	205	05,2415	12207 1	3DNADR	AGSBUFF +7	AGSBUFF+7...+12C
0313	REF	9	LAST	205	05,2416	02215 0	1DNADR	AGSBUFF +13C	AGSBUFF+13C,GARBAGE
0314	REF	2	LAST	104	05,2417	25167 0	6DNADR	CCMPNUMB	CCMPNUMB,UPCLCMCD,UPVERB,UPCCUNT, LPBLFF+0...+7
A0315									
0316	REF	1			05,2420	25203 1	6DNADR	UPPUFF +8C	LPBLFF +8C...+19D
0317	REF	1			05,2421	32136 1	DNPTR	LMAGSI02	COMMON DATA
0318	REF	6	LAST	203	05,2422	00024 1	1DNADR	TIME2	TIME2/1
0319	REF	1			05,2423	32145 0	DNPTR	LMAGSI03	COLLECT SNAPSHOT
0320	REF	16	LAST	203	05,2424	24240 0	6DNADR	DNTMBLFF	SEND SNAPSHOT
0321	REF	1			05,2425	32154 0	DNPTR	LMAGSI04	COMMON DATA
0322	REF	5	LAST	201	05,2426	07115 0	2DNADR	PCSTCRKU	PCSTCRKU,NEGTCRKU,POSTCRKV,NEGTCRKV
0324	REF	9	LAST	203	05,2427	00007 0	1DNADR	SPARE	
0325	REF	10	LAST	205	05,2430	00007 0	1DNADR	SPARE	
0326	REF	3	LAST	203	05,2431	02020 1	1DNADR	AGSK	AGSK,+1
0327	REF	2	LAST	205	05,2432	25173 0	6DNADR	UPBUFF	LPBLFF+0...+11D
0328	REF	3	LAST	205	05,2433	15207 0	4DNADR	UPPUFF +12C	UPBUFF+12C...+19D
0329	REF	6	LAST	203	05,2434	01326 1	1DNADR	LEMMASS	LEMMASS,CSMASS
0330	REF	37	LAST	203	05,2435	01277 1	1DNADR	IMODES30	IMODES30,IMODES33
0331	REF	11	LAST	205	05,2436	00007 0	1DNADR	SPARE	
0332	REF	1			05,2437	32157 0	DNPTR	LMAGSI05	COMMON DATA
0333	REF	15	LAST	197	05,2440	52755 1	-6DNADR	DSPTAB	DSPTAB+0...+11D

R0334 ----- SLP-LISTS -----

0335	REF	6	LAST	203	05,2136		LMAGSI02	EQUALS	LMORBM02	COMMON DOWNLIST DATA
0336	REF	6	LAST	203	05,2145		LMAGSI03	EQUALS	LMORBM03	COMMON DOWNLIST DATA
0337	REF	6	LAST	203	05,2154		LMAGSI04	EQUALS	LMORBM04	COMMON DOWNLIST DATA
0338	REF	6	LAST	203	05,2157		LMAGSI05	EQUALS	LMORBM05	COMMON DOWNLIST DATA

R0339 -----

0340	REF	2	LAST	194	05,2441	02172 1	ENTABLE	CENADR	LMCSTADL	LM COAST AND ALIGN DOWNLIST
0341	REF	3	LAST	194	05,2442	02407 0		CENADR	LMAGSICL	LM AGC INITIALIZATION/UPDATE DOWNLIST
0342	REF	1			05,2443	02232 0		CENADR	LMRENDL	LM RENDEZVUS AND PRE-THRUST DOWNLIST
0343	REF	1			05,2444	02066 0		CENADR	LMORBM0L	LM ORBITAL MANEUVERS DOWNLIST
0344	REF	1			05,2445	02303 0		CENADR	LMDSASDL	LM DESCENT AND ASCENT DOWNLIST

L DOWNLINK LIST

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C345 REF 1

05,2446 02357 1

(ENACR LMLSALDL

LM LUNAR SURFACE ALIGN DOWNLIST

RJ346 -----

L ACS INITIALIZATION

USER'S PAGE NO. 1 EO S4

R0001 PROGRAM NAME: ACS INITIALIZATION (R47)

R0002 WRITTEN BY : PHODE / KILPCY / FOLLETT

R0003 MOD NO. : 0

R0004 DATE : 23 MARCH 1967

R0005 MOD BY : KILPCY

R0006 MOD NO. : 1

R0007 DATE : 28 OCTOBER 1967

R0008 MOD BY : FOLLETT

R0009 FUNCT. DESC.: (1) TO PROVIDE THE ACS ABORT ELECTRONICS ASSEMBLY(AEA) WITH THE LEM AND CSM STATE VECTORS
 R0011 (POSITION,VELOCITY,TIME) IN LEM IMU COORDINATES BY MEANS OF THE LGC DIGITAL DOWNLINK.

R0012 (2) TO ZERO THE ICDC, LGC AND AEA GIMBAL ANGLE COUNTERS SIMULTANEOUSLY IN ORDER TO ESTABLISH A
 R0015 COMMON ZERO REFERENCE FOR THE MEASUREMENT OF GIMBAL(EULER) ANGLES WHICH DEFINE LEM ATTITUDE

R0019 (3) TO ESTABLISH THE GROUND ELAPSED TIME OF AEA CLOCK ZERO.(IF AN AEA CLOCK ZERO IS
 R0021 REQUESTED DURING THIS PROGRAM

R0022 LOG SECTION : ACS INITIALIZATION

R0023 CALLING SEQ : PROGRAM IS ENTERED WHEN ASTRONAUT KEYS V47E ON ESKY.

R0024 R47 MAY BE CALLED AT ANY TIME EXCEPT WHEN ANOTHER EXTENDED VERB IS IN PROGRESS

R0026 SUBROUTINES

R0027 CALLED :

R0028 NORMAL EXIT : ENDEXT

R0029 ALARM/ABORT : ALARM - BAD REFSMMAT - CODE:220

R0030 OPERATOR ERROR IF V47 SELECTED DURING ANOTHER EXTENDED VERB.

R0032 ERASABLES

R0033 USED : SAMPTIME (2) TIME OF ENTER: KEYSTROKE

R0034 ACSK (2) GROUND ELAPSED TIME OF THE AEA CLOCK :ZERO:

R0036 ACSBLFF (140) CONTAINS ACS INITIALIZATION DATA (SEE :OUTPUT: BELCW)

R0038 ACSWORD (1) PREVIOUS DOWNLIST SAVED HERE

0039 REF 10 LAST 205 E4,1600 EBANK= ACSBUFF

0040 40,2000 BANK 40

0041 REF 1 32,2000 SFTLOC R47

0042 32,2005 BANK

0043 REF 1 CCLNT* \$\$/R47

0044 REF 1 32,2005 3 4737 0 ACSINIT CAF REFSMBIT

0045 REF 1 32,2006 7 0077 0 MASK FLAGWRD3

0046 REF 36 LAST 192 32,2007 10 000 0 CCS A

CHECK REFSMFLG.

L AGS INITIALIZATION

LSFR'S PAGE NO. 2 E4 S3

0047	REF	1		32,2010	0 2017 0	TC	RECSPTM	PFFSMMAT IS CK
0048	REF	8	LAST 186	32,2011	0 5567 0	TC	ALARM	REFSMMAT IS PAD
0049				32,2012	00220 1	CCT	220	
0050	REF	1		32,2013	0 5472 0	TC	ENDEXT	
0061				32,2014	0 0006 1	NEWAGS	EXTEND	
0062	REF	1		32,2015	3 0014 1	CCA	SAMPTIME	TIME OF THE :ENTER: KEYSTROKE
0063	REF	4	LAST 205	32,2016	53'421 0	DXCH	AGSK	BFCOMES NEW AEA CLOCK :ZERO:
0064				32,2017	0 0006 1	RECSPTM	EXTEND	
0065	REF	5	LAST 206	32,2020	3 1421 1	CCA	AGSK	
0066	REF	2	LAST 102	32,2021	53'051 0	DXCH	DSPTMX	
0067	REF	1		32,2022	3 2172 1	AGSCISPK	CAF	VO6N16
0068	REF	1		32,2023	0 4616 1	TC	BANKCALL	R1 = 00XXX. FRS., R2 = 000XX MIN.,
0069	REF	1		32,2024	20334 1	CADR	GCMAKRF	R3 = CXX.XX SEC.
0070	REF	2	LAST 206	32,2025	0 5472 0	TC	ENDEXT	TERMINATE RETURN
0071	REF	1		32,2026	0 2036 0	TC	AGSVCALC	FRCEEC RETURN
00711	REF	22	LAST 181	32,2027	4 4746 1	CS	BIT6	IS ENTER VIA A V32
00712	REF	12	LAST 98	32,2030	6 0154 1	AD	MPAC	
00713				32,2031	0 0006 1	EXTEND		
00714	REF	1		32,2032	1 2014 1	BZF	NEWAGS	YES, USE KEYSTROKE TIME FOR NEW AGSK
0072				32,2033	0 0006 1	EXTEND		AC, NEW AGSK LOADED VIA V25
0073	REF	3	LAST 206	32,2034	3 1051 1	CCA	DSPTMX	LOADED INTO DSPTMX BY KEYING
0074	REF	2	LAST 208	32,2035	0 2016 1	TC	RECSPTM -1	V25E FOLLOWED BY HPS., MINS., SECS.
A0075								DISPLAY THE NEW K
0076	REF	1		32,2036	0 6042 1	AGSVCALC	TC	INTPRET
00761				32,2037	77614 1	SFT		
00762	REF	1		32,2040	01076 1		NCDCFLAG	DCNT ALLOW V37
0077				32,2041	77414 0	SET	EXIT	
0078	REF	1		32,2042	02076 1		XDSPFLAG	
0079	REF	2	LAST 208	32,2043	3 2172 1	CAF	VO6N16	
00795	REF	2	LAST 206	32,2044	0 4616 1	TC	BANKCALL	
00796	REF	1		32,2045	20621 0	CADR	EXCSPRET	
0082	REF	2	LAST 208	32,2046	0 6042 1	TC	INTPRET	EXTRAPCLATE LFM AND CSM STATE VECTORS
0083				32,2047	77634 0	RTB		TC THE PRESENT TIME
0084	REF	1		32,2050	21574 1		LOADTIME	LOAD MPAC WITH TIME2, TIME1
0085	REF	1		32,2051	34041 0	STCALL	TDEC1	CALCULATE LFM STATE VECTOR
0086	REF	2	LAST 37	32,2052	27060 1		LFMPREC	
0087				32,2053	77624 1	CALL		CALL ROUTINE TO CONVERT TO SM CCCDS AND
0088	REF	1		32,2054	64132 0		SCALEVEC	PROVIDE PROPER SCALING
0089	REF	11	LAST 207	32,2055	16201 0	STCDL	AGSBLFF	(LFMPREC AND CSMPREC LEAVE TDEC1 IN TAT)
0090	REF	1		32,2056	00015 0		TAT	TAT = TIME TO WHICH RATT1 AND VATT1 ARE
0091	REF	2	LAST 206	32,2057	34041 0	STCALL	TDEC1	COMPUTED (CSEC SINCE CLOCK START 8-2E).
0092	REF	2	LAST 37	32,2060	27044 1		CSMPREC	CALCULATE CSM STATE VECTOR FOR SAME TIME
0093				32,2061	77624 1	CALL		
0094	REF	2	LAST 206	32,2062	64132 0		SCALEVEC	

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0095	REF	12	LAST	208	32,2063	16207 0	STODL	AGSBUFF +6	
0096	REF	2	LAST	208	32,2064	00015 0		TAT	
0097					32,2065	56225 1	DSU	DCV	CALCULATE AND STORE THE TIME
0098	REF	6	LAST	208	32,2066	02021 0		AGSK	
0099	REF	1			32,2067	24175 1		TSCALE	
0100	REF	13	LAST	209	32,2070	02215 0	STORE	AGSBUFF +120	
0101					32,2071	77776 1	EXIT		
0102	REF	1			32,2072	3 4753 1	CAF	LAGSLIST	
0103	REF	2	LAST	99	32,2073	54 333 0	TS	DNI STCOD	
0104	REF	1			32,2074	3 2176 0	CAF	20 SEC	DELAY FOR 20 SEC WHILE THE AGS
0105	REF	3	LAST	208	32,2075	0 4616 1	TC	BANKCALL	DOWNLIST IS TRANSMITTED
0106	REF	1			32,2076	01736 1	CADR	DELAYJCB	
0107	REF	1			32,2077	3 1321 0	CA	AGSWOPC	
0108	REF	3	LAST	209	32,2100	54 333 0	TS	DNLSTCOD	RETURN TO THE OLD DOWNLIST
0109	REF	2	LAST	167	32,2101	3 4744 1	CAF	IMUSEBIT	
0110	REF	6	LAST	186	32,2102	7 0074 0	MASK	FLAGWRD	CHECK IMUSE FLAG.
0111	REF	37	LAST	207	32,2103	10 000 0	CCS	A	
0112	REF	1			32,2104	0 2122 1	TC	AGSEND	IMU IS BEING USED - DO NOT ZERO
01121	REF	1			32,2105	11 301 0	CKSTALL	CCS	IMUCADR
01122					32,2106	1 2111 0	TCF	+3	CHECK FOR IMU USAGE WHICH AVOIDS THE
01123					32,2107	1 2115 1	TCF	+6	IMUSE BIT: I.E., IMU COMPENSATION.
01124					32,2110	1 2111 0	TCF	+1	FREE. GO AHEAD WITH THE IMU ZERO.
01125	REF	1			32,2111	2 4363 0	CAF	TEM	
01126	REF	4	LAST	209	32,2112	0 4616 1	TC	BANKCALL	WAIT .1 SEC AND TRY AGAIN.
01127	REF	2	LAST	209	32,2113	01736 1	CADR	DELAYJCB	
01128	REF	1			32,2114	1 2105 0	TCF	CKSTALL	
0113	REF	5	LAST	209	32,2115	0 4616 1	+6	TC	BANKCALL
0114	REF	1			32,2116	16706 1	CADR	IMUZERC	IMU IS NOT IN USE
0115	REF	6	LAST	209	32,2117	0 4616 1	TC	BANKCALL	SET IMU ZERO DISCRETE FOR 320MSECS
0116	REF	1			32,2120	17710 1	CADR	IMUSTALL	WAIT 3SEC FOR COUNTERS TO INCREMENT
0117	REF	2	LAST	209	32,2121	0 2122 1	TC	AGSEND	
0118	REF	1			32,2122	0 5516 0	AGSEND	TC	DOWNFLAG
0119	REF	2	LAST	208	32,2123	00054 0	ADRES	NOCPFLAG	ALLOW V37
0120	REF	1			32,2124	3 2173 0	CAF	V5CN16	
0121	REF	7	LAST	209	32,2125	0 4616 1	TC	BANKCALL	
01211	REF	1			32,2126	20342 0	CADR	GMARK3	
01212	REF	3	LAST	208	32,2127	1 5472 1	TCF	ENDEXT	
01213	REF	4	LAST	209	32,2130	1 5472 1	TCF	ENDEXT	
0122	REF	5	LAST	209	32,2131	0 5472 0	TC	ENDEXT	
0127					32,2132	64375 1	SCALEVEC	VLCAD	MXV
0128	REF	1			32,2133	00025 0		VATT1	
0129	REF	4	LAST	203	32,2134	01734 0		REFSMAT	
0130					32,2135	72561 0	VXSC	VSL2	
0131	REF	1			32,2136	24202 1		VSCALE	

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01311				32,2137	53255	0	VAC	VAC	THIS SECTION ROUNDS THE VECTOR, AND CORRECTS FOR THE FACT THAT THE AGS IS A 2'S COMPLEMENT MACHINE WHILE THE IGC IS A 1'S COMPLEMENT MACHINE.
01312	REF	1		32,2140	24204	1		AGSRND1	
01313	REF	1		32,2141	24212	0		AGSRND2	
01314				32,2142	77634	0	PTP		
01315	REF	1		32,2143	21772	1		VECSGNAG	
0132	REF	2	LAST	209	32,2144	24225	0	STGVL	VATT1
0133	REF	1			32,2145	00017	1		RATT1
0134					32,2146	74321	1	MXV	VXSC
0135	REF	5	LAST	209	32,2147	01734	0		REFSMAT
0136	REF	1			32,2150	24200	0		RSCALE
0137					32,2151	53212	0	VSL8	VAC
01371	REF	2	LAST	210	32,2152	24214	1		AGSRND1
01372					32,2153	47755	1	VAC	RTB
01373	REF	2	LAST	210	32,2154	24212	0		AGSRND2
01374	REF	2	LAST	210	32,2155	21773	1		VECSGNAG
01375					32,2156	77750	0	LXA,1	
0138	REF	3	LAST	210	32,2157	00024	1		VATT1
0139					32,2160	72130	0	SXA,1	LXA,1
0140	REF	13	LAST	208	32,2161	00155	0		MPAC +1
0141	REF	4	LAST	210	32,2162	00026	0		VATT1 +2
0142					32,2163	72130	0	SXA,1	LXA,1
0143	REF	14	LAST	210	32,2164	00160	0		MPAC +4
0144	REF	5	LAST	210	32,2165	00030	1		VATT1 +4
0145					32,2166	43530	0	SXA,1	RVQ
0146	REF	15	LAST	210	32,2167	00162	1		MPAC +6
0147	REF	6	LAST	184	4753			LAGSLIST =	CNF
0148					32,2170	00216	1	V01N14	VN
01485					32,2171	14400	0	V50N00A	VN
0149	REF	1			6016			V00N25	EQUALS
01495					32,2172	01420	0	V06N16	VN
01496	REF	1			4242			V00N34	EQUALS
01497					32,2173	14420	1	V50N16	VN
0150					32,2174	03100	0	TSCALE	2DEC
0150					32,2175	00000	1		100B-10
0151					32,2176	03720	1	20SEC	DEC
0152					32,2177	15077	0	RSCALE	2DEC
0152					32,2200	75041	1		3.280839 B-3
0153					32,2201	24402	1	VSCALE	2DEC
0153					32,2202	25724	1		3.280839 E2 B-9
01531					32,2203	00000	1	AGSRND1	2CCT
01531					32,2204	60000	1		0000060000
01532					32,2205	00000	1		2CCT
01532					32,2206	60000	1		0000060000
01533					32,2207	00000	1		2CCT
01533					32,2210	60000	1		0000060000
01534					32,2211	00000	1	AGSRND2	2CCT
01534					32,2212	37777	1		0000037777
01535					32,2213	00000	1		2CCT
01535					32,2214	37777	1		0000037777

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01536	32,2215	00000 1
01536	32,2216	37777 1
0154	REF 1	30,2000

ZCCT 0000037777

SEANK= LCWSUPER

FCF SLESEQUENT LCW 2CAERS.

FRESH START AND RESTART

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000743					10,2000				EANK	10		
0075					05,2000				SETLCC	FFANDRES		
0076	REF	2	LAST	43	05,2447				BANK			
0077					05,2447							
0078	REF	3	LAST	155	E3,1400				EBANK=	LST1		
0079	REF	2	LAST	43 TC	43:	1	1*		COUNT*	\$/START		FRESH AND RESTART
0080					05,2447	0 0004 0	SLAP1		INHINT			FRESH START. COMES HERE FROM PINBALL.
0081	REF	1			05,2450	0 3105 0			TC	STARTSUE		SUBROUTINE DOES MOST OF THE WORK.
0082	REF	1			05,2451	1 2456 0	STARTSW	TCF	SKIPSIM			PATCH....TCF STARTSIM...FOR SIMULATION
0083	REF	22	LAST	175	05,2452	3 4736 1	STARTSIM	CAF	P1T14			
0084	REF	1			05,2453	0 5105 0		TC	FINDVAC			
0085					05,2454	77777 0	SIM2CACP	OCT	77777			PATCH 2CAGR (AND EBANK DESIGNATION) OF
0086					05,2455	77777 0		CCT	77777			SIMULATION START ADDRESS.
0087	REF	16	LAST	205	05,2456	3 1035 0	SKIPSIM	CA	DSPTAB	+11C		
00871	REF	1			05,2457	7 4771 0		MASK	BITS486			TURN OFF ALL DSPTAB +11C LAMPS
00872	REF	17	LAST	173	05,2461	6 4735 1		AD	BIT15			EXCEPT THE GIMBAL LOCK & NO ATT ONLY ON
0088	REF	17	LAST	212	05,2461	55'135 1		TS	DSPTAB	+11C		REQUESTED FRESH START.
0093	REF	7	LAST	192	05,2462	3 4755 1		CA	ZERO			
00931	REF	2	LAST	108	05,2463	55'265 1		TS	ERRCOUNT			
00931F	REF	1			05,2464	54 375 1		TS	FAILREG			
00932	REF	2	LAST	212	05,2465	54 376 1		TS	FAILREG	+1		
009325	REF	3	LAST	212	05,2466	54 377 0		TS	FAILREG	+2		
00933	REF	2	LAST	195	05,2467	54 377 1		TS	REDOCTR			
009335	REF	1			05,2470	4 4644 1		CS	PRIC12			
00934	REF	9	LAST	161	05,2471	55'310 0		TS	DSRUPTSW			
0094	REF	23	LAST	212	05,2472	3 4736 1	DCFSTART	CAF	P1T14			INSURE ENGINE IS OFF.
0095					05,2473	0 0006 1		EXTEND				
0096	REF	7	LAST	181	05,2474	01 011 0		WRITE	DSALMOUT			
0097	REF	8	LAST	212	05,2475	4 4755 0		CS	ZERO			
0098	REF	1			05,2476	54 355 0		TS	THPLST			
0099	REF	1			05,2477	3 4751 0	DCFSTR1	CAF	FCUR			
0100	REF	1			05,2500	55'262 1		TS	RCSFLAGS			INITIALIZE ATTITUDE ERROR DISPLAYS.
0101	REF	2	LAST	175	05,2501	3 4355 0		CA	PRI03C			
0102	REF	1			05,2502	54 366 0		TS	RESTREG			SUPER BANK PRIORITY FOR DISPLAYS.
0103	REF	9	LAST	212	05,2503	3 4755 1		CA	ZERO			
0104	REF	2	LAST	105	05,2504	55'245 1		TS	ABCELV			DAE INITIALIZATION
0105	REF	1			05,2505	54 371 0		TS	NVSARE			
0106	REF	1			05,2506	55'071 1		TS	EBANKTEM			
0107	REF	6	LAST	193	05,2507	55'257 1		TS	CH5MASK			
0108	REF	5	LAST	193	05,2510	55'260 0		TS	CH6MASK			
0109	REF	7	LAST	193	05,2511	55'273 1		TS	PVALVEST			FOR RCS FAILURE MONITOR

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0110	REF	2	LAST	108	05,2512	55'360 1	TS	ERESTORE	***** MUST NOT BE REMOVED FROM DCFSTART
0111	REF	2	LAST	108	05,2513	55'362 0	TS	SMDDE	***** MUST NOT BE REMOVED FROM DCFSTART
0112	REF	4	LAST	209	05,2514	54 333 0	TS	DALSTOCD	SELECT PCO DCWALIST
0113	REF	2	LAST	209	05,2515	55'321 1	TS	AGSWCRD	ALLOW AGS INITIALIZATION
0114	REF	2	LAST	111	05,2516	55'501 0	TS	UPSVFLAG	ZERO UPDATE STATE VECTOR REQUEST FLAGWCRD
0115					05,2517	0 0006 1	EXTEND		
0116	REF	1			05,2520	01 0006 0	WRITE	CHAN5	TURN OFF RCS JETS.
0117					05,2521	0 0006 1	EXTEND		
0118	REF	1			05,2522	01 0006 0	WRITE	CHAN6	TURN OFF RCS JETS.
0119					05,2523	0 0006 1	EXTEND		
0120	REF	14	LAST	188	05,2524	01 012 0	WRITE	CHAN12	
0121					05,2525	0 0006 1	EXTEND		
0122	REF	1			05,2526	01 013 1	WRITE	CHAN13	
0123					05,2527	0 0006 1	EXTEND		
0124	REF	3	LAST	176	05,2530	01 014 0	WRITE	CHAN14	
0125	REF	18	LAST	212	05,2531	4 1035 1	CS	DSPTAB +11D	
0126	REF	2	LAST	212	05,2532	7 4771 0	MASK	BITS486	
0127	REF	38	LAST	209	05,2533	10 000 0	CCS	A	
0128					05,2534	0 2540 1	TC	+4	
0129	REF	3	LAST	213	05,2535	3 4771 1	CA	BITS486	
0130					05,2536	0 0006 1	EXTEND		
0131	REF	15	LAST	213	05,2537	05 012 1	WCR	CHAN12	THE IML WAS IN CCARSE ALIGN IN GIMBAL
0132	REF	1			05,2540	0 2641 0	TC	MR.KLEAN	LOCK, SO PUT IT BACK INTO CCARSE ALIGN.
0133	REF	10	LAST	212	05,2541	4 4755 0	CS	ZERO	
0134	REF	1			05,2542	55'010 0	TS	MCCREG	
0135	REF	1			05,2543	3 3360 1	CAF	IM30INIF	FRESH START IMU INITIALIZATION.
0136	REF	38	LAST	205	05,2544	55'277 0	TS	IMCDES30	
0137	REF	1			05,2545	3 3065 1	CAF	MAXDB	
0138	REF	1			05,2546	55'343 0	TS	DB	
0139	REF	2	LAST	212	05,2547	3 4751 0	CAF	FCUR	
0140	REF	1			05,2550	55'222 1	TS	RATFINDX	INITIALIZE KALCMANU RATE
0141	REF	1			05,2551	3 3161 0	CA	BOQLSTRT	
0142	REF	1			05,2552	54 111 1	TS	DAPBCCLS	
0143	REF	1			05,2553	3 5015 0	CAF	EBANK6	
0144	REF	1			05,2554	54 003 0	TS	EBANK	
0145	REF	1			06,1400		EBANK=	HIASCENT	
01451	REF	1			05,2555	3 3056 1	CA	STIKSTRT	
01452	REF	1			05,2556	55'444 0	TS	STIKSENS	
01453	REF	1			05,2557	3 3057 0	CA	RATESTRT	
01454	REF	2	LAST	131	05,2560	55'476 1	TS	-RATEDB	
0146	REF	1			05,2561	3 2000 0	CAF	FULLAFS	INITIALIZE MAXIMUM ASCENT MASS FOR USE
0147	REF	2	LAST	213	05,2562	55'400 0	TS	HIASCENT	BY 1/ACCS UNTIL THE FAC LOAD IS DONE.
0148	REF	1			05,2563	3 3062 0	CA	77001CCT	LOAD CAP FILTER GAINS FAC LOAD
0149	REF	1			05,2564	55'403 0	TS	OKTAPF	TO BEST PRESENT ESTIMATE OF COORDS
0150	REF	1			05,2565	55'406 0	TS	LMTRAP	.14 DEG
0151	REF	1			05,2566	3 3062 1	CA	60DEC	

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0152	REF	1		05,2567	55'405 0	TS	DKKACSN	
0153	REF	1		05,2570	55'411 1	TS	LMKACSN	6 SEC GAIN FOR ALPHA
0154	REF	11	LAST 213	05,2571	3 4755 1	CA	ZERC	
0155	REF	1		05,2572	55'407 1	TS	LMOMEGAN	UNITY GAIN
0156	REF	2	LAST 205	05,2573	3 4363 0	CA	TEN	
0157	REF	1		05,2574	55'404 1	TS	DKOMEGAN	1 SEC GAIN FOR CMEGA
0158	REF	17	LAST 192	05,2575	3 4744 1	CAF	BIT8	SET LOCKED CB TO 1.4 DEG. MAY OVERWRITE WITH FAD LOAD.
0159	REF	1		05,2576	55'411 0	TS	DKDB	
0160	REF	1		05,2577	3 5026 0	CAF	1M32INIT	
0161	REF	23	LAST 208	05,2600	6 4746 0	AD	BIT6	KEEP BOTH CAP AND ERROR-NEEDLES DISPLAY OFF UNTIL JCCU ZERO IS FINISHED.
0162	REF	16	LAST 182	05,2601	55'380 1	TS	1MODES33	
0163				05,2602	0 0006 1	EXTEND		INITIALIZE SWITCHES ONLY IN FRESH START.
0164	REF	1		05,2603	3 3365 1	DCA	SWINIT	
0165	REF	17	LAST 196	05,2604	52 075 1	DXCH	STATE	
0166	REF	2	LAST 214	05,2605	3 3366 1	CA	SWINIT +2	
0167	REF	18	LAST 214	05,2606	54 076 1	TS	STATE +2	
0168	REF	2	LAST 207	05,2607	3 4737 0	CA	PFESMBIT	DO NOT ALTER REFSMFLG ON FRESH START.
0169	REF	19	LAST 214	05,2610	7 0777 0	MASK	STATE +3	
0170	REF	3	LAST 214	05,2611	6 3367 0	AD	SWINIT +3	
0171	REF	20	LAST 214	05,2612	54 077 0	TS	STATE +3	
0172				05,2613	0 0006 1	EXTEND		
0173	REF	4	LAST 214	05,2614	3 3371 1	DCA	SWINIT +4	
0174	REF	21	LAST 214	05,2615	52 101 0	DXCH	STATE +4	
0175				05,2616	0 0006 1	EXTEND		
0176	REF	5	LAST 214	05,2617	3 3373 0	DCA	SWINIT +6	
0177	REF	22	LAST 214	05,2620	52 103 1	DXCH	STATE +6	
0178	REF	1		05,2621	3 4744 1	CA	SURFFRIT	DO NOT ALTER SURFFLAG ON FRESH START.
0179	REF	1		05,2622	6 4747 0	AD	CMCONBIT	CMCONFLG
0180	REF	1		05,2623	6 4741 1	AD	LMCONBIT	LMCONFLG
0181	REF	23	LAST 214	05,2624	7 0104 0	MASK	STATE +80	
0182	REF	6	LAST 214	05,2625	6 3374 1	AD	SWINIT +80	
0183	REF	24	LAST 214	05,2626	54 104 0	TS	STATE +80	
0184	REF	7	LAST 214	05,2627	3 3375 0	CA	SWINIT +90	
0185	REF	25	LAST 214	05,2630	54 105 1	TS	STATE +90	
0186	REF	1		05,2631	3 4737 0	CA	APSFRL11	DO NOT ALTER APSFLAG ON FRESH START.
0187	REF	26	LAST 214	05,2632	7 0106 1	MASK	STATE +100	
0188	REF	8	LAST 214	05,2633	6 3376 0	AD	SWINIT +100	
0189	REF	27	LAST 214	05,2634	54 106 1	TS	STATE +100	
0190	REF	9	LAST 214	05,2635	3 3377 1	CAF	SWINIT +110	
0191	REF	28	LAST 214	05,2636	54 107 0	TS	STATE +110	
0192	REF	2	LAST 166	05,2637	3 4635 0	FDRSTRT TO	POSTJUMP	NOW IN ANOTHER BANK.
0193	REF	1		05,2640	03211 0	CADP	PLMPYJOB + 2	PICKS UP AT RELINT. (CONT ZERO NEWJOB)
0194				05,2641	0 0004 0	MR.KLEAN	INHINT	
0195				05,2642	0 0006 1	EXTEND		
0196	REF	2	LAST 158	05,2643	3 4755 1	DCA	NEGO	
0197	REF	1		05,2644	52 754 0	DXCH	-PHASE2	

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0198					05,2645	0 0006 1	POCKLEAN	EXTEND	
0199	REF	3	LAST	214	05,2646	3 4755 1		DCA	NEGO
0200	REF	1			05,2647	52 760 1		EXCH	-PHASE4
0201					05,2650	0 0006 1	V37KLEAN	EXTEND	
0202	REF	4	LAST	215	05,2651	3 4755 1		DCA	NEGO
0203	REF	1			05,2652	52 762 0		EXCH	-PHASE5
0204					05,2653	0 0006 1	ABTKLEAN	EXTEND	
0205	REF	5	LAST	215	05,2654	3 4755 1		DCA	NEGO
0206	REF	1			05,2655	52 756 1		EXCH	-PHASE3
0207					05,2656	0 0006 1		EXTEND	
0208	REF	6	LAST	215	05,2657	3 4755 1		DCA	NEGO
0209	REF	1			05,2660	52 752 0		EXCH	-PHASE1
0210					05,2661	0 0006 1		EXTEND	
0211	REF	7	LAST	215	05,2662	3 4755 1		DCA	NEGO
0212	REF	1			05,2663	52 764 0		EXCH	-PHASE6
0213	REF	14	LAST	193	05,2664	0 0002 0		TC	Q

L FRESH START AND RESTART

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P0214 COMES HERE FROM LOCATION 400, CCJAM. RESTART ANY PROGRAMS WHICH MAY HAVE BEEN RUNNING AT THE TIME

0215	REF	4	LAST	212	05,1400		EBANK= LST1	
0217	REF	3	LAST	212	05,2665	24 320 0	GCPRG INCP REDOCTR	ADVANCE RESTART COUNTFF.
0218	REF	15	LAST	215	05,2666	22 002 0	LXCH G	
0219					05,2667	00 0026 1	EXTEND	
0220	REF	1			05,2670	24 007 1	RDP SUPERBANK	
0221	REF	2	LAST	196	05,2671	52 423 0	DXCH RSBBQ	
0222	REF	19	LAST	213	05,2672	3 1035 0	CA DSPTAB +110	
0223	REF	15	LAST	172	05,2673	7 4750 0	MASK BIT4	
0224					05,2674	0 0006 1	EXTEND	
0225					05,2675	1 2701 1	BZF +4	
0226	REF	24	LAST	214	05,2676	6 4746 0	AD BIT6	SET ERROR COUNTER ENABLE
0227					05,2677	0 0006 1	EXTEND	
0228	REF	16	LAST	213	05,2700	05 012 1	WCR CHAN12	ISS WAS IN COARS ALIGN SC GC PACK TC
0229	REF	1			05,2701	0 3066 1	BLTIONS TC LIGHTSET	

R0230
R0232
R0234
R0236
R0238

ERASCHK TEMPORARILY STORES THE CONTENTS OF TWO ERASABLE LOCATIONS, X AND X+1 INTO SKEEP5 AND SKEEP6. IT ALSO STORES X INTO SKEEP7 AND ERSTORE. IF ERASCHK IS INTERRUPTED BY A RESTART, C(ERSTORE) SHOULD EQUAL C(SKEEP7), AND BE A + NUMBER LESS THAN 2000 OCT. OTHERWISE C(ERSTORE) SHOULD EQUAL 40.

0239	REF	2	LAST	158	05,2702	3 4250 0	CAF H15	
0240	REF	3	LAST	213	05,2703	7 1360 1	MASK ERSTORE	
0241					05,2704	0 0006 1	EXTEND	
0242					05,2705	1 2707 1	BZF +2	
0243	REF	1			05,2706	1 3103 1	TCF NCNAVKEY +3	IF ERSTORE ACT = +0 OF +N LESS THAN 2K, DO FRESH START - E MEMORY MIGHT BE BAD
0244	REF	4	LAST	216	05,2707	4 1360 1	CS ERSTORE	
0245					05,2710	0 0006 1	EXTEND	
0246	REF	1			05,2711	1 2726 1	BZF DCRSTAPT	= +0 CONTINUE WITH RESTART.
0247	REF	1			05,2712	6 1377 0	AD SKEEP7	
0248					05,2713	0 0006 1	EXTEND	
0249					05,2714	1 2716 1	BZF +2	= SKEEP7, RESTORE E MEMORY.
0250	REF	2	LAST	216	05,2715	1 3103 1	TCF NCNAVKEY +3	DO FRESH START - E MEMORY MIGHT BE BAD
0251	REF	2	LAST	109	05,2716	3 1374 0	CA SKEEP4	
0252	REF	2	LAST	213	05,2717	54 003 0	TS FBANK	FBANK OF E MEMORY THAT WAS UNDER TEST.
0253					05,2720	0 0006 1	EXTEND	(NOT EXCH SINCE THIS MIGHT HAPPEN AGAIN)

WTRGAP ,WTRGAP ,DC2,TA,SYNIN ,GET ,DATA CHECK ,00000008,CSAM (NOT EXCH SINCE THIS MIGHT HAPPEN AGAIN)

L FRESH START AND RESTART

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0152	REF	1		05,2567	55'405 0	TS	DKKACSN	
0153	REF	1		05,2571	55'410 1	TS	LWKACSN	6 SEC GAIN FOR ALPHA
0154	REF	11	LAST 213	05,2571	3 4755 1	CA	ZEPD	
0155	REF	1		05,2572	55'407 1	TS	LMOMEGAN	UNITY GAIN
0156	REF	2	LAST 200	05,2573	3 4363 0	CA	TEN	
0157	REF	1		05,2574	55'404 1	TS	DKOMEGAN	1 SEC GAIN FOR OMEGA
0158	REF	17	LAST 192	05,2575	3 4744 1	CAF	BIT8	SET CCKED CB TO 1.4 DEC. MAY OVERWRITE
0159	REF	1		05,2576	55'411 0	TS	DKDB	WITH PAD LOAD.
0160	REF	1		05,2577	3 5026 0	CAF	IM33INIT	
0161	REF	23	LAST 208	05,2600	6 4746 0	AD	BIT6	KEEP BOTH GAP AND ERROR-NEEDLES DISPLAY
0162	REF	16	LAST 182	05,2601	55'300 1	TS	IMODE533	OFF UNTIL ICCU ZERO IS FINISHED.
0163				05,2602	0 0005 1	EXTEND		INITIALIZE SWITCHES ONLY ON FRESH START.
0164	REF	1		05,2603	3 3365 1	DCA	SWINIT	
0165	REF	17	LAST 196	05,2604	52 075 1	DXCH	STATE	
0166	REF	2	LAST 214	05,2605	3 3365 1	CA	SWINIT +2	
0167	REF	18	LAST 214	05,2606	54 076 1	TS	STATE +2	
0168	REF	2	LAST 207	05,2607	3 4737 0	CA	REFSMRIT	DO NOT ALTER REFSMFLG ON FRESH START.
0169	REF	19	LAST 214	05,2610	7 0077 0	MASK	STATE +3	
0170	REF	3	LAST 214	05,2611	6 3367 0	AD	SWINIT +3	
0171	REF	20	LAST 214	05,2612	54 077 0	TS	STATE +3	
0172				05,2613	0 0006 1	EXTEND		
0173	REF	4	LAST 214	05,2614	3 3371 1	DCA	SWINIT +4	
0174	REF	21	LAST 214	05,2615	52 101 0	DXCH	STATE +4	
0175				05,2616	0 0006 1	EXTEND		
0176	REF	5	LAST 214	05,2617	3 3373 0	DCA	SWINIT +6	

L FRESH START AND RESTART

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0152	REF	1		05,2567	55'405 0	TS	DKKACSN	
0153	REF	1		05,2571	55'410 1	TS	LNKACSN	6 SEC GAIN FCP ALPHA
0154	REF	11	LAST 213	05,2571	3 4755 1	CA	ZERO	
0155	REF	1		05,2572	55'407 1	TS	IMCMEGAN	UNITY GAIN
0156	REF	2	LAST 209	05,2573	3 4363 0	CA	TEN	
0157	REF	1		05,2574	55'404 1	TS	DKCMEGAN	1 SEC GAIN FOR OMEGA
0158	REF	17	LAST 192	05,2575	3 4744 1	CAF	BIT8	SET CCKED CB TO 1.4 DEG. MAY OVERWRITE
0159	REF	1		05,2576	55'411 0	TS	DK08	WITH PAD LOAD.
0160	REF	1		05,2577	3 5126 0	CAF	IM33INIT	
0161	REF	23	LAST 208	05,2600	6 4746 0	AD	BIT6	KEEP BOTH DAR AND ERROR-NEEDLES DISPLAY
0162	REF	16	LAST 182	05,2611	55'300 1	TS	IMODES33	OFF UNTIL IDU ZERO IS FINISHED.
0163				05,2612	0 0006 1	EXTEND		INITIALIZE SWITCHES ONLY ON FRESH START.
0164	REF	1		05,2613	3 3365 1	DCA	SWINIT	
0165	REF	17	LAST 196	05,2614	52 175 1	DXCH	STATE	
0166	REF	2	LAST 214	05,2615	3 3366 1	CA	SWINIT +2	
0167	REF	18	LAST 214	05,2616	54 176 1	TS	STATE +2	
0168	REF	2	LAST 207	05,2617	3 4727 0	CA	REFSMBIT	DO NOT ALTER REFSMFLG ON FRESH START.
0169	REF	19	LAST 214	05,2617	7 0077 0	MASK	STATE +3	
0170	REF	3	LAST 214	05,2611	6 3367 0	AD	SWINIT +3	
0171	REF	20	LAST 214	05,2612	54 077 0	TS	STATE +3	
0172				05,2613	0 0006 1	EXTEND		
0173	REF	4	LAST 214	05,2614	2 3371 1	DCA	SWINIT +4	
0174	REF	21	LAST 214	05,2615	52 101 0	DXCH	STATE +4	
0175				05,2616	0 0006 1	EXTEND		
0176	REF	5	LAST 214	05,2617	3 3373 0	DCA	SWINIT +6	
0407	REF	1		05,3144	3 3356 1	STARTSB2 CAF	OCT30001	DURING SOFTWARE RESTART, DO NOT DISTURB
0408				05,3145	0 0006 1	EXTEND		ENGINE ON, OFF AND ISS WARNING.
0409	REF	10	LAST 217	05,3146	03 011 1	WAND	DSALMCUT	
04092	REF	1		05,3147	4 4743 1	CS	READPBIT	CLEAR READRFLG FOR R25.
04093	REF	2	LAST 207	05,3150	7 0077 0	MASK	FLAGWRD3	
04094	REF	3	LAST 220	05,3151	54 077 0	TS	FLAGWRD3	

L FRESH START AND RESTART

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0410	REF	4	LAST	220	05,3152	4 0077 0	CS	FLAGWRD3	DURING SOFTWARE RESTART, CLEAR TURNON,
0411	REF	1			05,3153	7 4741 0	MASK	NR29FRIT	REPOSITION, CDU ZERO AND PEMCODE BITS
0412					05,3154	0 0006 1	EXTEND		IN RACMODES, SINCE TASKS ASSOCIATED
0413					05,3155	1 3157 0	PZF	+2	WITH THESE BITS HAVE BEEN KILLED
0414	REF	16	LAST	180	05,3156	3 4742 1	CAF	BIT10	ALSO IF R29 HAD BEEN REQUESTED,
0415	REF	1			05,3157	6 3352 0	AD	CCT32001	(NR29FLC = 0) CLEAR BIT 10 RACMODES
0416					05,3160	4 0000 0	COM		TO MAKE R29 FORGET IT HAD STARTED
0417	REF	16	LAST	220	05,3161	7 0110 0	MASK	RACMODES	DESIGNATING
0418	REF	17	LAST	221	05,3162	54 110 0	TS	RACMODES	
0419	REF	1			05,3163	3 3354 0	CAF	OCT27470	DURING SOFTWARE RESTART, DO NOT DISTURB
0420					05,3164	0 0006 1	EXTEND		IMU FLAGS. (COURSE ALIGN ENABLE, ZERO
0421	REF	17	LAST	216	05,3165	03 012 1	WAND	CHAN12	IMU CDLS, ENABLE IMU COUNTER) AND GIMBAL
AD422									TRIM DRIVES. LEAVE RR LOCKON ENABLE
AD423									ALONE.
04232	REF	2	LAST	187	05,3166	4 4750 0	CS	NR29FRIT	ENABLE P25.
04234	REF	6	LAST	217	05,3167	7 0101 0	MASK	FLAGWRD5	
04236	REF	7	LAST	221	05,3170	54 111 0	TS	FLAGWRD5	
04237	REF	1			05,3171	4 4741 0	CS	R77FLBIT	CLEAR R77FLAG
04238	REF	8	LAST	221	05,3172	7 0101 0	MASK	FLAGWRD5	
04239	REF	9	LAST	221	05,3173	54 101 0	TS	FLAGWRD5	
0424	REF	1			05,3174	3 3355 1	CAF	OCT74160	DURING SOFTWARE RESTART, DO NOT DISTURB
0425					05,3175	0 0006 1	EXTEND		TELEMETRY FLAGS, RESET TRAP FLAGS, AND
0426	REF	3	LAST	220	05,3176	03 013 0	WAND	CHAN13	ENABLE INTERRUPT FLAG.
0427	REF	14	LAST	87	05,3177	3 4740 0	CAF	BIT12	REENABLE RUPT1) (RUPT QUICKLY
0428					05,3200	0 0006 1	EXTEND		RESUMES EXCEPT DURING P64)
0429	REF	4	LAST	221	05,3201	05 013 0	WOR	CHAN13	
0430	REF	26	LAST	220	05,3202	3 4746 0	CAF	BIT6	DURING SOFTWARE RESTART, DO NOT DISTURB
0431					05,3203	0 0006 1	EXTEND		GYPO ENABLE FLAG.
0432	REF	5	LAST	217	05,3204	03 014 1	WAND	CHAN14	
0433	REF	5	LAST	216	05,3205	3 5007 0	EBANK=	LST1	
0434	REF	1			05,3205	3 5007 0	CAF	STARTEB	
0435	REF	4	LAST	220	05,3206	54 003 0	TS	EBANK	SFT FOR F3
0436	REF	1			05,3207	3 4734 0	CAF	NEG1/2	INITIALIZE WAITLIST DELTA-TS.
0437	REF	6	LAST	221	05,3210	55 407 1	TS	LST1 +7	
0438	REF	7	LAST	221	05,3211	55 406 0	TS	LST1 +6	
0439	REF	8	LAST	221	05,3212	55 405 0	TS	LST1 +5	
0440	REF	9	LAST	221	05,3213	55 404 1	TS	LST1 +4	
0441	REF	10	LAST	221	05,3214	55 403 0	TS	LST1 +3	
0442	REF	11	LAST	221	05,3215	55 402 1	TS	LST1 +2	
0443	REF	12	LAST	221	05,3216	55 401 1	TS	LST1 +1	
0444	REF	13	LAST	221	05,3217	55 400 0	TS	LST1	
0445	REF	1			05,3220	4 5235 1	CS	ENDTASK	
0446	REF	1			05,3221	55 410 1	TS	LST2	

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0447	REF	2	LAST	221	05,3222	55'412 0	TS	LST2 +2	
0448	REF	3	LAST	222	05,3223	55'414 0	TS	LST2 +4	
0449	REF	4	LAST	222	05,3224	55'416 1	TS	LST2 +6	
0450	REF	5	LAST	222	05,3225	55'420 1	TS	LST2 +8D	
0451	REF	6	LAST	222	05,3226	55'422 0	TS	LST2 +10D	
0452	REF	7	LAST	222	05,3227	55'424 0	TS	LST2 +12D	
0453	REF	8	LAST	222	05,3230	55'426 1	TS	LST2 +14D	
0454	REF	9	LAST	222	05,3231	55'430 0	TS	LST2 +16D	
0455	REF	2	LAST	221	05,3232	4 5237 0	CS	ENDTASK +1	
0456	REF	10	LAST	222	05,3233	55'411 0	TS	LST2 +1	
0457	REF	11	LAST	222	05,3234	55'413 1	TS	LST2 +3	
0458	REF	12	LAST	222	05,3235	55'415 1	TS	LST2 +5	
0459	REF	13	LAST	222	05,3236	55'417 0	TS	LST2 +7	
0460	REF	14	LAST	222	05,3237	55'421 0	TS	LST2 +9D	
0461	REF	15	LAST	222	05,3240	55'423 1	TS	LST2 +11D	
0462	REF	16	LAST	222	05,3241	55'425 1	TS	LST2 +13D	
0463	REF	17	LAST	222	05,3242	55'427 0	TS	LST2 +15D	
0464	REF	18	LAST	222	05,3243	55'421 1	TS	LST2 +17D	
0465	REF	14	LAST	220	05,3244	4 4755 0	CS	ZERO	MAKE ALL EXECUTIVE REGISTER SFTS
0466	REF	1			05,3245	54 167 0	TS	PRIORITY	AVAILABLE.
0467	REF	2	LAST	222	05,3246	54 202 1	TS	PRIORITY +12D	
0468	REF	3	LAST	222	05,3247	54 217 1	TS	PRIORITY +24D	
0469	REF	4	LAST	222	05,3250	54 233 1	TS	PRIORITY +36D	
0470	REF	5	LAST	222	05,3251	54 247 1	TS	PRIORITY +48D	
0471	REF	6	LAST	222	05,3252	54 263 1	TS	PRIORITY +60D	
0472	REF	7	LAST	222	05,3253	54 277 1	TS	PRIORITY +72D	
0473	REF	8	LAST	222	05,3254	54 313 1	TS	PRIORITY +84D	
0474	REF	10	LAST	212	05,3255	55'310 0	TS	DSRUPTSW	
0475	REF	1			05,3256	54 067 1	TS	NEWJOB	SHOWS AC ACTIVE JOBS.
0476	REF	1			05,3257	3 3351 0	CAF	VACIADRC	MAKE ALL VAC AREAS AVAILAELE.
0477	REF	1			05,3260	54 400 1	TS	VAC1USE	
0478	REF	1			05,3261	6 3353 1	AD	LTHVACA	
0479	REF	1			05,3262	54 454 0	TS	VAC2USE	
0480	REF	2	LAST	222	05,3263	6 3353 1	AD	LTHVACA	
0481	REF	1			05,3264	54 530 0	TS	VAC3USE	
0482	REF	3	LAST	222	05,3265	6 3353 1	AD	LTHVACA	
0483	REF	1			05,3266	54 604 1	TS	VAC4USE	
0484	REF	4	LAST	222	05,3267	6 3353 1	AD	LTHVACA	
0485	REF	1			05,3270	54 660 0	TS	VAC5USE	
0486	REF	3	LAST	214	05,3271	3 4363 0	CAF	TFN	
0487	REF	25	LAST	218	05,3272	54 154 0	TS	MPAC	R1,R2,R3).
0489	REF	15	LAST	221	05,3273	4 4740 1	CS	BIT12	
0490	REF	26	LAST	222	05,3274	50 154 1	INDEX	MPAC	
0491	REF	22	LAST	217	05,3275	55'022 1	TS	DSPTAB	
0492	REF	27	LAST	222	05,3276	10 154 0	CCS	MPAC	
0493	REF	1			05,3277	1 3272 1	TCF	DSPOFF	

L FRESH START AND RESTART

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0494	REF	1		05,3310	55'323 0	TS	DELAYLOC	
0495	REF	2	LAST 223	05,3311	55'324 1	TS	DELAYLOC +1	
0496	REF	3	LAST 223	05,3312	55'325 0	TS	DELAYLOC +2	
0497	REF	1		05,3313	55'326 0	TS	RISAVE	
0498	REF	1		05,3314	54'345 1	TS	INLINK	
0499	REF	7	LAST 158	05,3315	54'775 0	TS	DSPCNT	
0500	REF	1		05,3316	55'041 1	TS	CADRSTOR	
0501	REF	1		05,3317	55'012 1	TS	REQPET	
0502	REF	1		05,3318	55'014 1	TS	CLPASS	
0503	REF	1		05,3319	55'011 1	TS	DSPLOCK	
0504	REF	1		05,3312	55'017 1	TS	MENSAVE	KILL MONITOR
0505	REF	1		05,3313	55'020 0	TS	MENSAVE1	
0506	REF	1		05,3314	55'000 1	TS	VERBREG	
0507	REF	1		05,3315	55'001 0	TS	ACLNREG	
0508	REF	1		05,3316	55'042 1	TS	DSPLIST	
0509	REF	1		05,3317	55'317 0	TS	MARKSTAT	
0510	REF	1		05,3320	55'043 0	TS	EXTVBACK	MAKE EXTENDED VERBS AVAILABLE
0511	REF	2	LAST 209	05,3321	55'301 0	TS	IMUCADR	
0512	REF	1		05,3322	55'302 0	TS	PTCADR	
0513	REF	1		05,3323	55'303 1	TS	RADCADR	
0514	REF	2	LAST 106	05,3324	55'304 0	TS	ATTCADR	
0515	REF	1		05,3325	55'311 1	TS	LGYRC	
0516	REF	1		05,3326	54'100 1	TS	FLAGWRD4	KILL INTERFACE DISPLAYS
0517	REF	1		05,3327	3 4760 1	CAF	NCUTCCN	
0518	REF	6	LAST 161	05,3330	55'015 0	TS	NCLT	
0519	REF	7	LAST 210	05,3331	4 4753 0	CS	ONE	
0520	REF	1		05,3332	55'077 1	TS	SAMPLIN	
0521	REF	27	LAST 221	05,3333	3 4746 0	CAF	BIT6	
0522	REF	17	LAST 214	05,3334	7 1300 1	MASK	IMODES33	LEAVE BIT 6 UNCHANGED
0523	REF	2	LAST 214	05,3335	6 5026 0	AD	IM33INIT	NO PIR OR TM FAILS. PIT6=0 IN THIS WORD.
0524	REF	18	LAST 223	05,3336	55'320 1	TS	IMODES33	
0525	REF	1		05,3337	3 3350 1	CAF	LESCHK	SELF CHECK GO-TO REGISTER.
0526	REF	2	LAST 108	05,3340	55'361 0	TS	SELFRET	
0527	REF	1		05,3341	4 4760 1	CS	V01	
0528	REF	2	LAST 159	05,3342	54'776 0	TS	DSPCLNT	
0529	REF	17	LAST 219	05,2343	3 4002 0	TC	Q	
0530	REF	6	LAST 220	05,2344	3 4002 0	EBANK=	ACSC	
0531	REF	1		05,2344	32024 0	IDLEADR	2CADR	DAPICLER
0531	REF	1		05,3345	34765 0			
0532				05,2346	00435 0	IFAILINE	CCT	435
0533	REF	1		05,2347	02507 0	LDNPHAS1	GENADR	DNPHASE1
0534	REF	1		05,3350	03357 0	LESCHK	GENADR	SELFCHK
0535	REF	2	LAST 222	05,3351	00400 0	VAC1ACRC	ADRES	VAC1USE
0536				05,3352	32001 1	OCT32001	CCT	32001
0537				05,3353	00054 0	LTHVACA	CFC	44

L FRESH START AND PRESTART

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0538		05,3354	27470	1	OCT27470	OCT	27470	
0539		05,3355	74160	1	OCT74160	OCT	74160	
0540		05,3356	30001	0	OCT30001	OCT	30001	
0541	REF	1	5007		STARTER	EQUALS	FBANK3	
0542	REF	1	4756		NLMGRPS	EQUALS	FIVE	
0543		05,3357	77755	0	-ELR	OCT	-22	-ERROR LIGHT RESET KEY CODE.
0544		05,3358	37411	1	IN30INIT	OCT	37411	INHIBITS IML FAIL FOR 5 SEC AND PIP ISSW
0545		05,3361	37000	0	IN30INIR	OCT	37000	
0546	REF	2	5026		IN33INIT	=	PRIQ16	NO PIP CR TM FAIL SIGNALS.
0547		05,3362	00450	0	9,6,4	OCT	450	
0548		05,3363	00102	1	RNCODINIT	OCT	00102	
0549		05,3364	00000	1	SWINIT	OCT	0	
0550		05,3365	00000	1		OCT	0	
0551		05,3366	00000	1		OCT	0	
0552		05,3367	02000	0		OCT	02000	BIT 11 = NOR29FLG
0553		05,3370	00000	1		OCT	0	
0554		05,3371	00000	1		OCT	0	
0555		05,3372	00000	1		OCT	0	
0556		05,3373	00100	0		OCT	00100	
0557		05,3374	00000	1		OCT	0	
0558		05,3375	00000	1		OCT	0	
0559		05,3376	00000	1		OCT	0	
0560		05,3377	40000	0		OCT	40000	BIT 15 = LRBYPASS.

L FRESH START AND RESTART

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PC561 PROGRAM NAME GCTOPPOH ASSEMBLY SUNDANCE
 R0562 LOG SECTION FRESH START AND RESTART

R0563 FUNCTIONAL DESCRIPTION

R0564 FLASH V 37 CM DSKY 2MM CHANGE REQUEST "

R0565 INPUT/OUTPUT INFORMATION

R0566 A. CALLING SEQUENCE TC GCTOPPOH

R0567 B. ERASABLE INITIALIZATION NONE

R0568 C. OUTPUT FLASH V 37 CM DSKY

R0569 D. DEPPIS L

R0570 PROGRAM ANALYSIS

R0571 A. SUBROUTINES CALLED PRICDSPP, LINUS

R0572 B. NORMAL EXIT TCF ENDCFJOB

R0573 C. ALARM AND ABORT EXITS NONE

0574 6001 BLOCK 73
 0575 REF 2 LAST 40 6100 SETLCC FFTAG5
 0576 4001 BANK

0577 REF 1 COUNT# 11/POH
 0578 REF 1 6001 4 4764 0 GCTOPPOH CAF OCT33 4.33S FCT FOR GCPCCFIX
 0579 REF 13 LAST 193 6002 54 001 1 TS L
 0580 6002 4 0000 0 CCM
 0581 REF 2 LAST 215 6004 52 761 1 EXCH -PHASE4

0582 REF 3 LAST 214 6005 0 4635 0 TC POSTJUMP
 0583 REF 1 6006 10024 0 CADR GCPCCFIX
 0584 6007 00024 1 OCT24 MM 20
 0585 6010 00031 1 OCT31 MM 25

0586 20,2004 BANK 20
 0587 REF 1 04,2000 SETLOC VERB37
 0588 04,2024 BANK

0589 REF 1 COUNT# 11/POH VERB 37 AND P00 IN BANK 4.
 0590 REF 2 LAST 209 04,2024 0 5516 0 GCPCCFIX TC DOWNFLAG ALLOW X-AXIS OVERRIDE
 0591 REF 1 04,2025 00011 1 ADRES XCVINFLG

0592 REF 3 LAST 225 04,2026 0 5516 0 TC DOWNFLAG INSURE THAT ULLAGE IS OFF
 0593 REF 1 04,2027 00214 1 ADRES ULLAGFLG

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05935	REF	1	04,2030	0 5476	1	TC	CLFARMRK +2	PLEASE MARK DISPLAY SYSTEM.
0594	REF	1	04,2031	2 2037	1	CAF	V37N99	
0595	REF	8	04,2032	0 4616	1	TC	BANKCALL	
0596	REF	1	04,2033	20477	1	CADR	GCFLASH	
0597			04,2034	1 2031	0	TCF	-3	
0598			04,2035	1 2031	0	TCF	-4	
0599			04,2036	1 2031	0	TCF	-5	
0600			04,2037	11343	0	V37N99	VN	3799

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R0611 PROGRAM NAME V37 ASSEMBLY SUNDANCE

R0612 LOG SECTION FRESH START AND RESTART

R0613 FUNCTIONAL DESCRIPTION

R0614 1. CHECK IF NEW PROGRAM ALLOWED. IF BIT 1 OF FLAGWRD2(NODDFLAG) IS SET, AN ALARM 1520 IS CALLED.
 R0616 2. CHECK FOR VALIDITY OF PROGRAM SELECTED. IF AN INVALID PROGRAM IS SELECTED, THE OPERATOR ERROR LIGHT IS
 R0618 SET AND CURRENT ACTIVITY, IF ANY, CONTINUES.
 R0619 3. SERVICEP IS TERMINATED IF IT HAS BEEN RUNNING.
 R0610 4. INSTALL IS EXECUTED TO AVOID INTERRUPTING INTEGRATION.
 R0611 5. THE ENGINE IS TURNED OFF AND THE GAP IS INITIALIZED FOR COAST.
 R0612 6. TRACK AND UPDATE FLAGS ARE SET TO ZERO.
 R0613 7. DISPLAY SYSTEM IS RELEASED.
 R0614 8. THE FOLLOWING ARE PERFORMED FOR EACH OF THE THREE CASES.
 R0615 A. PROGRAM SELECTED IS PCP.
 R0616 1. RENDEZVOUS AND P25 FLAGS ARE RESET.(KILL P20 AND P25)
 R0617 2. STATINTL IS SCHEDULED BY SETTING RESTART GROUP 2.
 R0618 3. MAJOR MODE 00 IS STORED IN THE MODE REGISTER(MODREG).
 R0619 4. SUPERPAK 3 IS SELECTED.
 R0620 5. NODDFLAG IS RESET.
 R0621 6. ALL RESTART GROUPS EXCEPT GROUP 2 ARE CLEARED. CONTROL IS TRANSFERRED TO RESTART PROGRAM (COPROG2)
 R0623 WHICH CAUSES ALL CURRENT ACTIVITY TO BE DISCONTINUED AND A 9 MINUTE INTEGRATION CYCLE TO BE
 R0625 INITIATED.
 R0626 B. PROGRAM SELECTED IS P20 OR P25.
 R0627 1. IF THE CURRENT MAJOR MODE IS THE SAME AS THE SELECTED NEWPROGRAM, THE PROGRAM IS RE-INITIALIZED
 R0629 VIA V37XFC, ALL RESTART GROUPS, EXCEPT GROUP 4 ARE CLEARED.
 R0631 2. IF THE CURRENT MAJOR MODE IS NOT EQUAL TO THE NEW REQUEST, A CHECK IS MADE TO SEE IF THE REQUEST-
 R0633 ED MAJOR MODE HAS BEEN RUNNING IN THE BACKGROUND,
 R0634 AND IF IT HAS, NO NEW PROGRAM IS SCHEDULED, THE EXISTING
 R0635 P20 OR P25 IS RESTARTED TO CONTINUE, AND ITS M M IS SET.
 R0636 3. CONTROL IS TRANSFERRED TO COPROG2.
 R0637 C. PROGRAM SELECTED IS NEITHER PCP, P20, NOR P25
 R0638 1. V37XFC IS SCHEDULED (AS A JOB) BY SETTING RESTART GROUP 4
 R0639 2. ALL CURRENT ACTIVITY EXCEPT RENDEZVOUS AND TRACKING IS DISCONTINUED BY CLEARING ALL RESTART
 R0641 GROUPS. IF THE RENDEZVOUS OR THE P25 FLAG IS ON, GROUP 2 IS NOT CLEARED, ALLOWING THESE PROGRAMS
 R0643 TO CONTINUE.

R0644 INPUT/OUTPUT INFORMATION

R0645 A. CALLING SEQUENCE

R0646 CONTROL IS DIRECTED TO V37 BY THE VERFFAN ROUTINE.
 R0647 VERFFAN GOES TO C(VERFTAB+C(VERBREG)). VERB 37 = MMCHANG.
 R0648 MMCHANG EXECUTES A TC POSTJUMP, CALL V37.

R0649 P. FRASABLE INITIALIZATION NONE

R0650
 R0651 C. OUTPUT

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R0652 MAJOR MODE CHANGE

R0653 C. DEPRIS

R0654 MMNUMBER, MPAC +1, MINDEX, BASETEMP +C(MINDEX), FLAGWPD, FLAGWRC1, FLAGWRC2, MODREG, COLCC -1,
R0656 GOLCC, GOLCC +1, GOLCC +2, BASETEMP, -PHASE2, PHASE2, -PHASE4

R0657 PROGRAM ANALYSIS

R0658 A. SUBROUTINES CALLED

R0659 ALARM, RELOSP, PINBRNCH, INTSTALL, ENGINEF2, ALLCOAST, V37KLEAN, GOPRCG2, FALTON, FINDVAC, SLPERSW,
R0661 DSPMM

R0662 B. NORMAL EXIT TO ENDCFJCB

R0663 C. ALARMS 152 (MAJOR MODE CHANGE NOT PERMITTED)

0664	REF	1		04,2040	54 774 1	V37	TS	MMNUMBER	SAVE MAJOR MODE
0665	REF	4	LAST 219	04,2041	3 4355 0		CAF	PRI030	RESTART AT PINBALL PRIORITY
0666	REF	2	LAST 212	04,2042	54 366 0		TS	RESTREG	

0667	REF	41	LAST 217	04,2043	3 1277 1		CA	IMODES30	IS IML BEING INITIALIZED
0668	REF	28	LAST 223	04,2044	7 4746 1		MASK	BIT6	
0669	REF	43	LAST 218	04,2045	10 000 0		CCS	A	
0670	REF	1		04,2046	1 2065 1		TCF	CANTROD	

0671	REF	2	LAST 220	04,2047	4 0774 1		CS	MMNUMBER	IS P70 REQUESTED?
0672	REF	1		04,2050	6 2401 0		AD	DEC70	

0673				04,2051	0 0006 1		EXTEND		
0674	REF	1		04,2052	1 2374 1		BZF	SETUP71	YES
0675	REF	8	LAST 223	04,2053	6 4753 1		AD	CNE	IS P71 REQUESTED?

0676				04,2054	0 0006 1		EXTEND		
0677	REF	1		04,2055	1 2373 0		BZF	SETUP71	YES

0678	REF	3	LAST 228	04,2056	3 0774 0		CA	MMNUMBER	IS NEW REQUEST PCC
0679				04,2057	0 0006 1		EXTEND		
0680	REF	1		04,2060	1 2107 1		BZF	ISSERVON	YES, CHECK SERVICER STATUS

0681	REF	3	LAST 166	04,2061	4 0076 1		CS	FLAGWRD2	NO, IS MODE V37 FLAG SET
0682	REF	1		04,2062	7 4753 0		MASK	NODDBIT	

0683	REF	44	LAST 228	04,2063	10 000 0		CCS	A	
0684	REF	1		04,2064	1 2072 1		TCF	CHECKTAB	NO
0685	REF	10	LAST 218	04,2065	0 5567 0	CANTROD	TC	ALARM	
0686				04,2066	01520 1		EOT	1520	

0687	REF	1		04,2067	0 4457 0	V37BAC	TC	RELOSP	RELEASES DISPLAY FROM ASTRONAUT
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0688	REF	4	LAST 225	04,2070	0 4635 0		TC	PCSTJUMP	BRING BACK LAST NORMAL DISPLAY IF THERE
0689	REF	1		04,2071	21051 0		CADR	PINBRNCH	WAS ONE. OTHERWISE DO AN ECJ.

0690	REF	1		04,2072	3 2466 1	CHECKTAB	CA	NCV37MM	INDEX FOR MM TABLES.
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0691	REF	28	LAST	222	04,2173	54 155 1	AGAINMM	TS	MPAC +1	
0692	REF	29	LAST	229	04,2174	50 155 0		NDX	MPAC +1	
0693	REF	1			04,2175	3 2435 1		CA	PRFMM1	CERTAIN WHICH MM THIS IS FOR
0694	REF	1			04,2176	7 6077 0		MASK	LOW7	
0695					04,2177	4 0100 0		CCM		
0696	REF	4	LAST	228	04,2110	6 0774 0		AD	MMNUMBER	
0697	REF	45	LAST	228	04,2111	10 000 0		CCS	A	
0698	REF	20	LAST	229	04,2112	10 155 1		CCS	MPAC +1	IF GR, SEE IF ANYMORE IN LIST
0699	REF	1			04,2113	1 2073 0		TCF	AGAINMM	YES, GET NEXT ONE
0700	REF	1			04,2114	1 2324 1		TCF	V37NCNO	LAST TIME OR PASSED MM
0701	REF	31	LAST	229	04,2115	2 0155 0		CA	MPAC +1	
0702	REF	1			04,2116	54 773 0		TS	MINDEX	SAVE INDEX FOR LATER
0703	REF	2	LAST	187	04,2107	4 0113 1	ISSERVON	CS	FLAGWRD7	V37 FLAG SET - I.F. IS SERVICE GOING
0704	REF	1			04,2110	7 4746 1		MASK	V37FLBIT	
0705	REF	46	LAST	229	04,2111	10 000 0		CCS	A	
0706	REF	1			04,2112	1 2132 1		TCF	CANV37	NO
0707	REF	4	LAST	229	04,2113	0 5516 0		TC	DOWNFLAG	YES, TURN OFF THE AVERAGE FLAG AND
0708	REF	1			04,2114	0 1163 0		ADRES	AVEGFLAG	WAIT FOR SERVICE TO RETURN TO V37PET.
0711	REF	1			04,2115	1 5155 1		TCF	ENDOFJOB	
0712	REF	9	LAST	218	04,2116	4 0074 0	V37RET	CS	FLAGWRD0	IS P20 OF P22 RUNNING?
0713	REF	2	LAST	186	04,2117	7 4745 1		MASK	RNDVZBIT	
0714	REF	47	LAST	229	04,2121	10 000 0		CCS	A	
0715					04,2121	1 2123 1		TCF	+2	NO. CHECK FOR P25.
0716	REF	1			04,2122	1 2130 0		TCF	2.7SPT	YES. CC 2.7SPCT
0717	REF	10	LAST	229	04,2123	4 0074 0		CS	FLAGWRD0	IS P25 RUNNING?
0718	REF	1			04,2124	7 4743 1		MASK	P25FLBIT	
0719	REF	48	LAST	229	04,2125	10 000 0		CCS	A	
0720	REF	1			04,2126	3 2370 1	2.0SPT	CA	OCT37667	
0721	REF	15	LAST	219	04,2127	6 4747 1	2.11SPT	AD	BIT5	
0722	REF	1			04,2130	6 2371 0	2.7SPT	AD	OCT40072	
0723	REF	1			04,2131	0 5357 0		TC	PHSCHNG	
0724	REF	15	LAST	222	04,2132	3 4755 1	CANV37	CAF	ZEPC	
0725					04,2133	0 0206 1		EXTEND		
0726	REF	2	LAST	216	04,2134	01 007 1		WRITE	SUPPPENK	
0727	REF	1			04,2135	3 2367 1		CAF	PCDAD	
0728	REF	1			04,2136	54 374 0		TS	TEMPFLSH	
0729	REF	1			04,2137	0 5353 1		TC	PHASCHNG	
0730					04,2140	0 0014 1		OCT	14	
0731	REF	3	LAST	208	04,2141	0 6042 1	RCC	TC	INTPRET	
0732					04,2142	77624 1		CALL		WAIT FOR INTEGRATION TO FINISH

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0733	REF	1		04,2143	27412 0		INTSTALL	
0734				04,2144	77776 1	DUMMYAD	EXIT	
0735	REF	5	LAST	229	04,2145	0 5516 0	TC	DOWNFLAG
0736	REF	1			04,2146	00124 0	ADRES	3 AXISFLG RESET 3-AXIS FLAG
07362	REF	6	LAST	230	04,2147	0 5516 0	TC	DOWNFLAG
07364	REF	1			04,2150	00055 1	ADRES	PCCHFLAG
0737	REF	1			04,2151	3 4735 1	CAF	LRBYBIT CLEAN UP THE R12 FLAGWORD.
0738	REF	1			04,2152	54 177 0	TS	FLGWRD11
07382	REF	7	LAST	230	04,2152	0 5516 0	TC	DOWNFLAG
07384	REF	2	LAST	71	04,2154	00063 1	ADRES	R04FLAG INSURE THAT THE R04FLAG IS CLEAR.
073845	REF	8	LAST	230	04,2155	0 5516 0	TC	DOWNFLAG
07385	REF	1			04,2156	00056 1	ADRES	GLCKFAIL FLAGWORD 3 BIT 14
07386	REF	9	LAST	230	04,2157	0 5516 0	TC	DOWNFLAG
07388	REF	1			04,2160	00141 0	ADRES	MUNFLAG INSURE MUNFLAG IS CLEAR.
0739	REF	10	LAST	230	04,2161	0 5516 0	TC	DOWNFLAG
0740	REF	2	LAST	225	04,2162	00311 1	ADRES	XDVINFLE ALLOW X-AXIS OVERRIDE.
0741	REF	5	LAST	225	04,2163	10 774 1	CCS	MMNUMBER IS THIS A PCCH REQUEST
0742	REF	1			04,2164	1 2312 1	TCF	NOUVEAU NO, PICK UP NEW PROGRAM
0743	REF	2	LAST	228	04,2165	0 4457 0	PCCH	TC RELEASE DISPLAY SYSTEM
0744	REF	1			04,2166	3 5017 1	CAF	PRI05 SET VARIABLE RESTART PRIORITY FOR
0745	REF	1			04,2167	55 055 1	TS	PHSPRT2 POC INTEGRATION.
0746	REF	1			04,2170	0 6011 1	TC	CLRADNCD CLRAENCE DOES AN IN-FINT.
0747	REF	2	LAST	228	04,2171	4 4753 0	CS	NCDORIT TURN OFF NCDORFLAG.
0748	REF	4	LAST	228	04,2172	7 0076 1	MASK	FLAGWRD2
0749	REF	5	LAST	230	04,2172	54 076 1	TS	FLAGWRD2
0750	REF	2	LAST	224	04,2174	3 4756 1	CA	FIVE SET RESTART FOR STATEINT1
0751	REF	14	LAST	225	04,2175	54 001 1	TS	L
0752					04,2176	4 0000 0	CCM	
0753	REF	2	LAST	214	04,2177	52 754 0	EXCH	-PHASE2
0754	REF	1			04,2200	4 2372 1	CS	OCT700 TURN OFF P20, P25, IMU IN USE FLAG
0755	REF	11	LAST	229	04,2201	7 0074 1	MASK	FLAGWRD3
0756	REF	12	LAST	230	04,2202	54 074 0	TS	FLAGWRD3 READFLG
0757	REF	1			04,2203	3 4755 1	CAF	DNLADP00
0758	REF	6	LAST	217	04,2204	54 333 0	SEUDOP00	TS SET UP APPROPRIATE DOWNLIST CODE
0759	REF	4	LAST	217	04,2205	55 021 1	TS	AGSWCRD (CURRENT LIST WILL BE COMPLETED BEFORE

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AC760	REF	6	LAST	177	04,2216	0 4674 0	TC	IBKCALL	NEW ONE IS STARTED)
0761	REF	6	LAST	177	04,2216	0 4674 0	TC	IBKCALL	
0762	REF	1			04,2217	75561 1	CADR	ENGINEF1	
0763	REF	7	LAST	231	04,2210	0 4674 0	TC	IBKCALL	INSURE ALLOCAST.
0764	REF	1			04,2211	40205 1	CADR	ALLOCAST	CCES A RESTORE.
0765	REF	1			04,2212	4 4775 1	CS	OCT12	TURN OFF TRACK, UPDATE FLAGS
0766	REF	2	LAST	212	04,2213	551071 1	TS	EBANKTEM	
0767	REF	5	LAST	218	04,2214	7 0075 1	MASK	FLAGWRD1	
0768	REF	6	LAST	231	04,2215	54 0075 1	TS	FLAGWRD1	
0769	REF	3	LAST	231	04,2216	0 4674 0	TC	IBKCALL	KILL GROUPS 1,3,5,6
0770	REF	1			04,2217	12650 1	CADR	V27KLEAN	
0771	REF	6	LAST	230	04,2220	11 774 1	CCS	MMNUMBER	IS IT POCH
0772	REF	1			04,2221	1 2230 0	TCF	RENDVCC	NO
0773	REF	9	LAST	231	04,2222	0 4674 0	TC	IBKCALL	REDUNDANT EXCEPT FOR GROUP 4
0774	REF	1			04,2223	12645 0	CADR	PCKCLEAN	
0775	REF	7	LAST	231	04,2224	3 0774 0	CA	MMNUMBER	
0776	REF	3	LAST	218	04,2225	551011 0	TS	MCDREG	
0777	REF	5	LAST	228	04,2226	0 4635 0	TC	POSTJUMP	
0778	REF	1			04,2227	12766 0	CADR	GOPRG2	
0779	REF	4	LAST	231	04,2230	4 1410 0	CS	MCDREG	IS CURRENT PROGRAM 22
0780	REF	1			04,2231	6 2330 0	AD	OCT26	
0781	REF	1			04,2232	0 0006 1	EXTEND		
0782	REF	1			04,2233	1 2252 1	BZF	RESFT22	YES - CLEAR RENDEZVOUS FLAG
0783	REF	8	LAST	231	04,2234	4 0774 1	CS	MMNUMBER	IS NEW PROGRAM P22
0784	REF	2	LAST	231	04,2235	6 2330 0	AD	OCT26	
0785	REF	1			04,2236	0 0006 1	EXTEND		
0786	REF	2	LAST	231	04,2237	1 2252 1	BZF	RESFT22	
0787	REF	1			04,2240	6 7751 0	AD	NEG2	IS NEW PROGRAM = P20 OR P25
0788	REF	1			04,2241	0 0006 1	EXTEND		
0789	REF	1			04,2242	1 2264 1	BZF	RENDVCC	YES
0790	REF	2	LAST	230	04,2243	6 4756 1	AD	FIVE	25
0791	REF	1			04,2244	0 0006 1	EXTEND		
0792	REF	2	LAST	231	04,2245	1 2264 1	BZF	RENDVCC	YES
0793	REF	1			04,2246	3 2326 1	CA	OCT50	NO, IS EITHER P20 OR P25 RUNNING
0794	REF	13	LAST	230	04,2247	7 0074 0	MASK	FLAGWRD1	
0795	REF	40	LAST	229	04,2250	10 0000 0	CCS	A	
0796	REF	1			04,2251	1 2261 1	TCF	PODFIZZ	YES, LEAVE GROUP 2 TO PICK UP P20 OR P25

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0797	REF	2	LAST	230	04,2252	4	2372	1	RESET22	CS	CCT700	CLEAR RENDEZVOUS, P25
0798	REF	14	LAST	231	04,2253	7	0074	0		MASK	FLAGWRD0	AND IMC IN USE FLAGS
0799	REF	15	LAST	232	04,2254	54	074	0		TS	FLAGWRD0	
0800	REF	2	LAST	230	04,2255	0	6011	1		TC	CLRACNCD	
0801					04,2256	0	0006	1	KILL2	EXTEND		NO, KILL 2
0802	REF	8	LAST	215	04,2257	3	4755	1		CCA	NEG0	
0803	REF	3	LAST	230	04,2260	52	754	0		EXCH	-PHASE2	
0804	REF	1			04,2261	3	2366	0	PCCFI22	CAF	V37QCAD	RESTART POINT FOR V37XEQ
0805	REF	2	LAST	229	04,2262	54	374	0		TS	TEMPFLSH	
0806	REF	1			04,2263	1	2226	1		TCF	GOGNPROG	
0807	REF	5	LAST	231	04,2264	4	1010	0	RENDNCC	CS	MOREG	
0808	REF	1			04,2265	6	6007	0		AD	OCT24	
0809					04,2266	0	0006	1		EXTEND		
0810	REF	1			04,2267	1	2256	0		BZF	KILL2	P20 OR P25 ON TOP OF P20 OR P25 -
0811	REF	4	LAST	231	04,2270	6	4756	1		AD	FIVE	
0812					04,2271	0	0006	1		EXTEND		
0813	REF	2	LAST	232	04,2272	1	2256	0		BZF	KILL2	
0814	REF	2	LAST	231	04,2273	3	2326	1		CA	OCT500	
0815	REF	16	LAST	232	04,2274	7	0074	0		MASK	FLAGWRD0	
0816	REF	9	LAST	231	04,2275	6	0774	0		AD	MMNUMBER	
0817					04,2276	4	0000	0		CCM		
0818	REF	1			04,2277	6	2331	1		AD	P20 PFG	IS IT 20 AND IS RENDEZVOUS FLAG ON
0819					04,2300	0	0006	1		EXTEND		
0820	REF	1			04,2301	1	2306	1		BZF	STATQUO	YES
0821	REF	1			04,2302	6	2327	0		AD	OCT305	IS IT 25 AND IS P25 BIT ON
0822					04,2303	0	0006	1		EXTEND		
0823	REF	2	LAST	232	04,2304	1	2306	1		BZF	STATQUO	YES, LEAVE AS IS
0824	REF	3	LAST	232	04,2305	1	2256	0		TCF	KILL2	
0825	REF	7	LAST	231	04,2306	4	0075	1	STATQUO	CS	FLAGWRD1	SET TRACKFLAG
0826	REF	2	LAST	231	04,2307	7	4775	1		MASK	OCT120	UPDATE FLAG
0827	REF	8	LAST	232	04,2310	26	075	1		ADS	FLAGWRD1	
0828	REF	1			04,2311	1	2222	0		TCF	GCMCE	
0829	REF	3	LAST	232	04,2312	3	2326	1	HOLVFAU	CAF	OCT500	IS P20 OR P25 FLAG SET
0830	REF	17	LAST	232	04,2313	7	0074	0		MASK	FLAGWRD0	
0831	REF	50	LAST	231	04,2314	10	000	0		CCS	A	
0832					04,2315	1	2320	0		TCF	+3	YES
0833	REF	11	LAST	230	04,2316	0	5516	0		TC	DOWNFLAG	NO, RESET IMC IN USE FLAG
0834	REF	1			04,2317	0	0007	0		ADRES	IMUSE	
0835	REF	2	LAST	229	04,2320	50	773	1		INDEX	MINDEX	
0836	REF	1			04,2321	3	2467	0		CAF	DNACNMI	OBTAIN APPROPRIATE DOWNLIST ADDRESS

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0837					04,2322	0 0014 0		INHINT		
0838	REF	1			04,2323	1 2214 1		TCF	SFUDDPCD	
0839	REF	1			04,2324	0 4364 1	V37NCNC	TC	FALTCN	CONE FEFF IF NM REQUESTED DOFSAT EXIST
0840	REF	1			04,2325	1 2067 0		TCF	V37BAD	
0841	REF	17	LAST	217		4750		CCT00010	EQUALS	BIT4
0842					04,2326	0 0500 1	OCT500	OCT	500	BITS 7 AND 9
0843					04,2327	0 0305 1	OCT305	CCT	305	
0844					04,2330	0 0026 0	OCT26	CCT	26	
0845					04,2331	0 0124 0	P2JREF	CCT	124	
0846					04,2332	1 0004 0	V37XEC	INHINT		
0847	REF	3	LAST	232	04,2333	5 1 773 1		INDEX	MINDEX	
0848	REF	2	LAST	229	04,2334	3 2435 1		CAF	PREMM1	CERTAIN PRIQ, EBANK, AND NM
0849	REF	1			04,2335	55 0057 0		TS	MMTEMP	
0850	REF	1			04,2336	54 0020 1		TS	CYP	SHIFT RIGHT TO BITS 14 - 10
0851	REF	2	LAST	233	04,2337	3 0020 0		CA	CYR	
0852	REF	1			04,2340	7 7730 0		MASK	PRIC37	
0853	REF	1			04,2341	55 0061 0		TS	PHSPROT4	PRESFT GROUP 4 RESTART PRIORITY
0854	REF	1			04,2342	54 163 0		TS	NEWPRIQ	STORE PRIQ FOR SPVAC
0855	REF	2	LAST	233	04,2343	3 1057 1		CA	MMTEMP	CERTAIN EBANK - BITS 8, 9, 10 OF MMTEMP.
0856					04,2344	0 0016 1		EXTEND		
0857	REF	18	LAST	214	04,2345	7 4744 0		MP	BIT8	
0858	REF	1			04,2346	7 4757 1		MASK	LCW3	
0859	REF	15	LAST	230	04,2347	54 101 1		TS	L	
0860	REF	4	LAST	233	04,2350	50 773 1		INDEX	MINDEX	
0861	REF	1			04,2351	3 2404 0		CAF	FCADRMM1	
0862	REF	1			04,2352	55 0060 1		TS	PASFTMP	MAKE BROCN BY ADDING H15 OF FCADR
0863	REF	3	LAST	216	04,2353	7 4350 1		MASK	H15	
0864	REF	16	LAST	233	04,2354	26 001 1		ADS	L	
0865	REF	2	LAST	233	04,2355	3 1060 0		CA	PASFTMP	CERTAIN CENADR PORTION OF 2CADR.
0866	REF	1			04,2356	7 5012 0		MASK	LCW10	
0867	REF	15	LAST	166	04,2357	6 4741 1		AE	BIT11	
0868	REF	1			04,2360	0 5116 1		TC	SPVAC	
0869	REF	3	LAST	233	04,2361	3 1057 1	V37XEQC	CA	MMTEMP	UPON RETURN FROM FINDVAC PLACE THE
0870	REF	2	LAST	229	04,2362	7 6077 0		MASK	LCW7	NEW NM IN MCDRPG (THE LOW 7 BITS OF
0871	REF	1			04,2363	0 5214 1		TC	NEWMCDEA	PHSPRT11)
0872	REF	3	LAST	230	04,2364	0 4457 0		TC	RELDSP	RELEASE DISPLAY
0873	REF	2	LAST	229	04,2365	0 5155 0		TC	ENDCFJOB	AND EXIT
0874	REF	1				5650	NEC7	EQUALS	OCT77770	

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0875	REF	1		1157		MMTEMP	EQUALS	PFSPROT3
0876	REF	1		1160		BASETEMP	EQUALS	TBASE4
0877	REF	1		04,2366	10335 0	V37QCAC	CADR	V37XEG +3
0878	REF	1		04,2367	13144 1	RDPAC	CADR	DLMMYAD
0880				04,2370	37667 1	OCT37667	CCT	37667
0881				04,2371	40072 0	OCT40072	CCT	40072
0882				04,2372	00700 0	OCT700	CCT	700
R0883								
0884	REF	1		04,2373	3 6250 0	SETUP71	CAF	THREE
0885	REF	18	LAST 223	04,2374	54 002 1	SETUP70	TS	Q
0886				04,2375	0 0006 1		EXTEND	
0887	REF	1		04,2376	3 2403 1		CCA	P70CADR
0888	REF	19	LAST 234	04,2377	6 0002 0		AD	Q
0889				04,2400	52 006 0		DTCB	
0890				04,2401	00106 0	DEC70	DEC	70
0891	REF	3	LAST 148	07,1520			EPANK=	R
0892	REF	1		04,2402	02067 1	P70CADR	2CADR	P70
0892	REF	1		04,2403	42067 0			
R0893	FOR VERB 37 TWO TABLES ARE MAINTAINED. EACH TABLE HAS AN ENTRY FOR EACH							
R0894	MAJOR MODE THAT CAN BE STARTED FROM THE KEYBOARD. THE ENTRIES ARE PUT							
R0895	INTO THE TABLE WITH THE ENTRY FOR THE HIGHEST MAJOR MODE COMING FIRST,							
R0896	TO THE LOWEST MAJOR MODE WHICH IS THE LAST ENTRY IN EACH TABLE.							
R0897	THE FCADRM1 TABLE CONTAINS THE FCADR OF THE STARTING JOB OF							
R0898	THE MAJOR MODE. FOR EXAMPLE,							
A0899						FCADRM1	FCADR	P75
A0900							FCADR	PRNG18
A0901							FCADR	P01
								START OF P 79
								START OF P 18
								START OF P 01
R0902	NOTE,							THE FIRST ENTRY MUST BE LABELED FCADRM1.
R0903	----							
0906	REF	1		04,2404	26207 0	FCADRM1	FCADR	P76
0907	REF	1		04,2405	72541 1		FCADR	P75
0908	REF	1		04,2406	72457 1		FCADR	P74
0909	REF	1		04,2407	72225 1		FCADR	P73
0910	REF	1		04,2410	72036 1		FCADR	P72
0911	REF	1		04,2411	71271 0		FCADR	LANDJUNK
0912	REF	1		04,2412	64777 1		FCADR	P43LM
0913	REF	1		04,2413	33277 0		FCADR	P57
0914	REF	1		04,2414	32050 0		FCADR	PRNG52
0915	REF	1		04,2415	31421 1		FCADR	P51
0916	REF	1		04,2416	75442 1		FCADR	P47LM
0917	REF	1		04,2417	75414 1		FCADR	P42LM
0918	REF	1		04,2420	75276 0		FCADR	P41LM
0919	REF	1		04,2421	75153 1		FCADR	P40LM
0922	REF	1		04,2422	72635 1		FCADR	P35

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0923	RFF	1	04,2423	72455 0	FCADR	P34
0924	RFF	1	04,2424	72223 1	FCADP	P33
0925	RFF	1	04,2425	72034 0	FCADR	P32
0927	RFF	1	04,2426	72000 1	FCADR	P30
0928	RFF	1	04,2427	51400 0	FCADR	PRG25
0929	RFF	1	04,2430	50000 1	FCADR	PRG22
0931	RFF	1	04,2431	51575 0	FCADR	PRG21
0931	RFF	1	04,2432	50000 1	FCADR	PRG20
0932	RFF	1	04,2433	60561 0	FCADR	P12LM
0933	RFF	1	04,2434	77652 0	FCADR	P06

R0934 THE PREMM TABLE CONTAINS THE E-BANK, MAJOR MODE, AND PRIORITY
 R0935 INFORMATION, IT IS IN THE FOLLOWING FORM,

R0936 PPF PPF PFM MM MM

R0937 WHERE THE 7 M BITS CONTAIN THE MAJOR MODE NUMBER
 R0938 3 P BITS CONTAIN THE E-BANK NUMBER
 R0939 5 P BITS CONTAIN THE PRIORITY AT WHICH THE JOB IS
 R0940 TO BE STARTED

R0941 FOR EXAMPLE,

A0942	PREMM1	CCT	67213	PRIORITY	33
A0943				E-BANK	5
A0944				MAJOR MODE	11
A0945		CCT	25437	PRIORITY	12
A0946				E-BANK	6
A0947				MAJOR MODE	31

R0948 NOTE, THE FIRST ENTRY MUST BE LABELED PREMM1

0951	04,2435	27714 0	PREMM1	CCT	27714	MM 76	EBANK 7	PRIC 13
0952	04,2436	27713 1		CCT	27713	MM 75	EBANK 7	PRIC 13
0953	04,2437	27712 0		CCT	27712	MM 74	EBANK 7	PRIC 13
0954	04,2440	27711 0		CCT	27711	MM 73	EBANK 7	PRIC 13
0955	04,2441	27710 1		CCT	27710	MM 72	EBANK 7	PRIC 13
0956	04,2442	27704 1		CCT	27704	MM 68	EBANK 7	PRIC 13
0957	04,2443	27677 1		CCT	27677	MM 63	EBANK 7	PRIC 13
0958	04,2444	27271 0		CCT	27271	MM 57	EBANK 5	PRIC 13
0959	04,2445	27264 1		CCT	27264	MM 52	EBANK 5	PRIC 13
0960	04,2446	27263 0		CCT	27263	MM 51	EBANK 5	PRIC 13
0961	04,2447	27657 0		CCT	27657	MM 47	EBANK 7	PRIC 13
0962	04,2450	27652 0		CCT	27652	MM 42	EBANK 7	PRIC 13
0963	04,2451	27651 0		CCT	27651	MM 41	EBANK 7	PRIC 13
0964	04,2452	27650 1		CCT	27650	MM 40	EBANK 7	PRIC 13
0967	04,2453	27643 0		CCT	27643	MM 35	EBANK 7	PRIC 13
0968	04,2454	27642 1		CCT	27642	MM 34	EBANK 7	PRIC 13
0969	04,2455	27641 1		CCT	27641	MM 33	EBANK 7	PRIC 13
0970	04,2456	27640 0		CCT	27640	MM 32	EBANK 7	PRIC 13
0972	04,2457	27636 1		CCT	27636	MM 30	EBANK 7	PRIC 13
0973	04,2458	27631 0		CCT	27631	MM 25	EBANK 7	PRIC 13

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0974		04,2461	27626 0	OCT	27626	MM 22	FEANK 7	PRIC 13
0975		04,2462	27625 0	OCT	27625	MM 21	EBANK 7	PRIC 13
0976		04,2463	27624 1	OCT	27624	MM 20	EEANK 7	PRIC 13
0977		04,2464	27614 1	OCT	27614	MM 12	FEANK 7	PRIC 13
0978		04,2465	27606 1	OCT	27606	MM 06	FBANK 4	PRIC 13

R0979 NOTE, THE FOLLOWING CONSTANT IS THE NUMBER OF ENTRIES IN EACH OF

R0980 ----- THE ABOVE LISTS-1 (IF, THE NUMBER OF MAJOR MODES (EXCEPT P00)

R0981 THAT CAN BE CALLED FROM THE KEYBOARD MINUS ONE)

0992		04,2466	00037 1	NOV37MM	DEC	24	MM'S -1
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0985	REF	1		04,2467	00002 0	DNLA0MM1	ADRES	RENDEZVU	P76
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0986	REF	2	LAST	236	04,2470	00002 0	ADRES	RENDEZVU	P75
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0987	REF	3	LAST	236	04,2471	00002 0	ADRES	RENDEZVU	P74
------	-----	---	------	-----	---------	---------	-------	----------	-----

0988	REF	4	LAST	236	04,2472	00002 0	ADRES	RENDEZVU	P73
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0989	REF	5	LAST	236	04,2473	00002 0	ADRES	RENDEZVU	P72
------	-----	---	------	-----	---------	---------	-------	----------	-----

0990	REF	1			04,2474	00004 0	ADRES	DESASCNT	P68
------	-----	---	--	--	---------	---------	-------	----------	-----

0991	REF	2	LAST	236	04,2475	00004 0	ADRES	DESASCNT	P63
------	-----	---	------	-----	---------	---------	-------	----------	-----

0992	REF	1			04,2476	00005 1	ADRES	LUNRSALA	P57
------	-----	---	--	--	---------	---------	-------	----------	-----

0993	REF	1			04,2477	00000 1	ADRES	COSTALIN	P52
------	-----	---	--	--	---------	---------	-------	----------	-----

0994	REF	2	LAST	236	04,2500	00000 1	ADRES	COSTALIN	P51
------	-----	---	------	-----	---------	---------	-------	----------	-----

0995	REF	1			04,2501	00003 1	ADRES	ORBMANUV	P47
------	-----	---	--	--	---------	---------	-------	----------	-----

0996	REF	2	LAST	236	04,2502	00003 1	ADRES	ORBMANUV	P42
------	-----	---	------	-----	---------	---------	-------	----------	-----

0997	REF	3	LAST	236	04,2503	00003 1	ADRES	ORBMANUV	P41
------	-----	---	------	-----	---------	---------	-------	----------	-----

0998	REF	4	LAST	236	04,2504	00003 1	ADRES	ORBMANUV	P40
------	-----	---	------	-----	---------	---------	-------	----------	-----

1001	REF	6	LAST	236	04,2505	00002 0	ADRES	RENDEZVU	P35
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1002	REF	7	LAST	236	04,2506	00002 0	ADRES	RENDEZVU	P34
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1003	REF	8	LAST	236	04,2507	00002 0	ADRES	RENDEZVU	P33
------	-----	---	------	-----	---------	---------	-------	----------	-----

1004	REF	9	LAST	236	04,2510	00002 0	ADRES	RENDEZVU	P32
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1006	REF	10	LAST	236	04,2511	00002 0	ADRES	RENDEZVU	P30
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1007	REF	11	LAST	236	04,2512	00002 0	ADRES	RENDEZVU	P25
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1008	REF	2	LAST	236	04,2513	00005 1	ADRES	LUNRSALA	P22
------	-----	---	------	-----	---------	---------	-------	----------	-----

1009	REF	12	LAST	236	04,2514	00002 0	ADRES	RENDEZVU	P21
------	-----	----	------	-----	---------	---------	-------	----------	-----

1010	REF	13	LAST	236	04,2515	00002 0	ADRES	RENDEZVU	P20
------	-----	----	------	-----	---------	---------	-------	----------	-----

1011	REF	3	LAST	236	04,2516	00004 0	ADRES	DESASCNT	P12
------	-----	---	------	-----	---------	---------	-------	----------	-----

1012	REF	3	LAST	236	04,2517	00000 1	ADRES	COSTALIN	P06
------	-----	---	------	-----	---------	---------	-------	----------	-----

1013	REF	16	LAST	225	4755	DNLA0P00	=	ZERO
------	-----	----	------	-----	------	----------	---	------

1014					0000	COSTALIN	=	0
------	--	--	--	--	------	----------	---	---

1015					0001	AGSUPCAT	=	1
------	--	--	--	--	------	----------	---	---

1016					0002	RENDEZVU	=	2
------	--	--	--	--	------	----------	---	---

1017					0003	ORBMANUV	=	3
------	--	--	--	--	------	----------	---	---

1018					0004	DESASCNT	=	4
------	--	--	--	--	------	----------	---	---

1019					0005	LUNRSALA	=	5
------	--	--	--	--	------	----------	---	---

1020					13,2026	BANK	=	13
------	--	--	--	--	---------	------	---	----

1021	REF	2	LAST	46	13,2000	SFTLCC	INIT	INIT
------	-----	---	------	----	---------	--------	------	------

1022					13,2026	BANK		
------	--	--	--	--	---------	------	--	--

1023	REF	2	LAST	46 TO	46:	2	2*	COUNT# 11/INTIN
------	-----	---	------	-------	-----	---	----	-----------------

1024	REF	2	LAST	111	E3,1554	EBANK	=	RECTCSM
------	-----	---	------	-----	---------	-------	---	---------

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R1025 THIS ROUTINE DOES THE POF INTEGRATION

1026					13,2026	43014 0	STATELP	SFT	POF	EXTRAPOLATE CM STATE VECTOR
1027	REF	1			13,2027	01474 1			VINTEFLAG	
1028	REF	1			13,2030	04347 0			SURFFLAG	ALSO 6X6 W-MATRIX IF LM ON LUNAR
1029	REF	1			13,2031	26136 0			DCINT	SURFACE AND W-MATRIX VALID
1030					13,2032	43014 0		BOF	SET	FOR PENDEZVOLS NAVIGATION.
1031	REF	1			13,2033	02756 1			RENDFWLG	
1032	REF	2	LAST	237	13,2034	26526 0			DCINT	
1033	REF	1			13,2035	01476 0			DIMFLAG	
1034					13,2036	45014 0	DCINT	CLEAR	CALL	
1035	REF	1			13,2037	01667 1			PRECIFLG	ENGAGES 4-TIME STEP LOGIC IN INTEGRATION
1036	REF	1			13,2040	27135 1			INTEGRV	WHEN MODREG = 0
1037					13,2041	71214 0		PCN	DLCAC	
1038	REF	2	LAST	237	13,2042	04307 1			SURFFLAG	
1039	REF	1			13,2043	26163 0			NC-INT	
1040	REF	3	LAST	112	13,2044	01571 0			TFICSM	
1041	REF	3	LAST	208	13,2045	34141 0		STCALL	TDFCI	
1042	REF	2	LAST	230	13,2046	27412 0			INTSTALL	
1043					13,2047	45014 0		CLEAR	CALL	EXTRAPOLATE LM STATE VECTOR
1044	REF	2	LAST	237	13,2050	01674 0			VINTEFLAG	
1045	REF	1			13,2051	26645 1			SETIFLGS	
1046					13,2052	77614 1		POF		ALSO 9X9 W-MATRIX IF W IS VALID
1047	REF	2	LAST	237	13,2053	02756 1			RENDFWLG	
1048	REF	1			13,2054	26061 0			DCINT2	
1049					13,2055	43014 0		SET	SET	
1050	REF	2	LAST	237	13,2056	01476 0			DIMFLAG	
1051	REF	1			13,2057	01475 0			DECRSEIG	
1052					13,2060	45014 0	DCINT2	SFT	CALL	
1053	REF	2	LAST	237	13,2061	01467 0			PRECIFLG	DISENGAGE 4 TIME STEP LOGIC IN INTEG.
1054	REF	2	LAST	237	13,2062	27135 1			INTEGRV	
1055					13,2063	77614 1	NC-INT	CLEAR		
1056	REF	3	LAST	209	13,2064	01236 1			MODDFLAG	
1057	REF	1			13,2065	26533 0			ENDINT	

R1058 THISVINT IS CALLED BY F10TDAV1 AND2

1059					13,2066	43414 1	THISVINT	CLEAR	RVO	
1060	REF	3	LAST	237	13,2067	01674 0			VINTEFLAG	

L RESTART TABLES

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P0001 RESTART TABLES

R0002 -----

R0003 THERE ARE TWO FORMS OF RESTART TABLES FOR EACH GROUP. THEY ARE KNOWN AS THE EVEN RESTART TABLES AND THE ODD
 R0005 RESTART TABLES. THE ODD TABLES HAVE ONLY ONE ENTRY OF THREE LOCATIONS WHILE THE EVEN TABLES HAVE TWO ENTRIES
 R0007 EACH USING THREE LOCATIONS. THE INFORMATION AS TO WHETHER IT IS A JOB, WAITLIST, OR A LONGCALL IS GIVEN BY THE
 R0009 WAY THINGS ARE PUT INTO THE TABLES.
 R0010 A JOB HAS ITS PRIORITY STORED IN PROTTAB OF THE CORRECT PHASE SPOT - A POSITIVE PRIORITY INDICATES A
 R0012 FINDVAC JOB, A NEGATIVE PRIORITY A NOVAC. THE 2CADR OF THE JOB IS STORED IN THE CADRTAB.
 R0014 FOR EXAMPLE,

A0015 5.7SPCT OCT 23000
 A0016 2CADR SCMEJOB

R0017 A RESTART OF GROUP 5 WITH PHASE SEVEN WOULD THEN CAUSE SCMEJOB TO BE RESTARTED AS A FINDVAC WITH PRIORITY 23.

A0019 5.5SPCT OCT -23000
 A0020 2CADR ANYJOB

R0021 HERE A RESTART OF GROUP 5 WITH PHASE 7 WOULD CAUSE ANYJOB TO BE RESTARTED AS A NOVAC WITH PRIORITY 23.
 R0023 A LONGCALL HAS ITS GENADR OF ITS 2CADR STORED NEGATIVELY AND ITS BBON STORED POSITIVELY. IN ITS PROTTAB IS
 R0025 PLACED THE LOCATION OF A CP REGISTER THAT CONTAINS THE DELTA TIME THAT LONGCALL HAD BEEN ORIGINALLY STARTED
 R0027 WITH. EXAMPLE,

A0028 3.6SPOT GENADR DELTAT
 A0029 -GENADR LONGTASK
 A0030 BBON LONGTASK

A0031 OCT 31000
 A0032 2CADR JOBAGAIN

R0033 THIS WOULD START UP LONGTASK AT THE APPROPRIATE TIME, OR IMMEDIATELY IF THE TIME HAD ALREADY PASSED. IT SHOULD
 R0035 BE NOTED THAT IF DELTAT IS IN A SWITCHED F BANK, THIS INFORMATION SHOULD BE IN THE BBON OF THE 2CADR OF THE
 R0037 TASK. FROM ABOVE, WE SEE THAT THE SECOND PART OF THIS PHASE WOULD BE STARTED AS A JOB WITH A PRIORITY OF 31.

R0039 WAITLIST CALLS ARE IDENTIFIED BY THE FACT THAT THEIR 2CADR IS STORED NEGATIVELY. IF PROTTAB OF THE PHASE SPOT
 R0041 IS POSITIVE, THEN IT CONTAINS THE DELTA TIME, IF PROTTAB IS NEGATIVE THEN IT IS THE -GENADR OF AN ERASABLE
 R0043 LOCATION CONTAINING THE DELTA TIME, THAT IS, THE TIME IS STORED INDIRECTLY. IT SHOULD BE NOTED AS ABOVE, THAT
 R0045 IF THE TIME IS STORED INDIRECTLY, THE BBON MUST CONTAIN THE NECESSARY F BANK INFORMATION IF APPLICABLE. WITH
 R0047 WAITLIST WE HAVE ONE FURTHER OPTION, IF -0 IS STORED IN PROTTAB, IT WILL CAUSE AN IMMEDIATE RESTART OF THE
 R0049 TASK. EXAMPLES,

A0050 OCT 77777 THIS WILL CAUSE AN IMMEDIATE RESTART
 A0051 -2CADR ATASK OF THE TASK :ATASK:

A0052 DEC 200 IF THE TIME OF THE 2 SECONDS SINCE DUMMY
 A0053 -2CADR DUMMY WAS PUT ON WAITLIST IS UP, IT WILL BEGIN
 A0054 IN 10 MS, OTHERWISE IT WILL BEGIN WHEN
 A0055 IT NORMALLY WOULD HAVE BEGUN.

L RESTART TABLES

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A0056
A0057-GENADR DTIME
-2CADR TASKTASKWHERE DTIME CONTAINS THE DELTA TIME
OTHERWISE THIS IS AS ABOVE

R0058 ***** NOW THE TABLES THEMSELVES *****

0059 01,2002 BANK 01
0060 REF 1 01,2003 SETLOC RESTART
0061 1,2002 BANK

0062 01,2000 PPCTTAB EQUALS 12000
0063 01,2001 CADRTAB EQUALS 12001
A0064 USED TO FIND THE PRIORITY OR DELTATIME
THIS AND THE NEXT RELATIVE LOC CONTAIN
RESTART 2CADR

0065 REF 1 CCOUNT# 11/RSTAB TABLES IN BANK 1.
0066 REF 1 01,2002 0 0010 0 SIZETAB TC 1.2SPCT -12006
0067 REF 1 01,2003 0 0020 0 TC 1.3SPCT -12004
0068 REF 1 01,2004 0 0010 0 TC 2.2SPCT -12006
0069 REF 1 01,2005 0 0026 0 TC 2.3SPCT -12004
0070 REF 1 01,2006 0 0010 0 TC 3.2SPCT -12006
0071 REF 1 01,2007 0 0056 1 TC 3.3SPCT -12004
0072 REF 1 01,2008 0 0062 0 TC 4.2SPCT -12006
0073 REF 1 01,2009 0 0072 1 TC 4.3SPCT -12004
0074 REF 1 01,2010 0 0145 1 TC 5.2SPCT -12006
0075 REF 1 01,2011 0 0163 0 TC 5.3SPCT -12004
0076 REF 1 01,2012 0 0010 0 TC 6.2SPCT -12006
0077 REF 1 01,2013 0 0174 0 TC 6.3SPCT -12004
0078 01,2016 21000 1 1.2SPCT OCT 21000 A DUMMY EXAMPLE TO BE REPLACED AS SOON

0079 REF 29 LAST 214 0074 EBANK= STATE
0080 REF 3 LAST 233 01,2017 05155 0 2CADR ENDOFJOB AS THERE IS A LEGITIMATE 1.2SPCT
0081 01,2020 04060 0
0082 REF 3 LAST 239 01,2021 00144 0 DEC 100
0083 REF 3 LAST 167 01,2022 05261 1 EBANK= STATE
2CADR TASKCOVER

0084 ANY MORE GROUP 1. EVEN RESTART VALUES SHOULD GO HERE
01,2023 04060 0

0085 REF 2 LAST 148 01,2024 76300 0 1.3SPCT -GENADR SAVET-30
0086 REF 2 LAST 148 07,1515 EBANK= DVCNTR
0087 REF 1 01,2025 75427 1 -2CADR ULLGTASK

0087 REF 1 01,2026 02710 1
00872 01,2027 32000 0 1.5SPCT OCT 32000
00874 REF 3 LAST 202 07,1654 EBANK= HMEAS
00876 REF 1 01,2030 03622 0 2CADR REREPCS
00876 REF 1 01,2031 66067 0

R0088 ANY MORE GROUP 1. CDD RESTART VALUES SHOULD GO HERE

0089 REF 2 LAST 239 01,2016 2.2SPCT EQUALS 1.2SPOT
R0090 ANY MORE GROUP 2. EVEN RESTART VALUES SHOULD GO HERE

0091 REF 1 01,2022 02621 1 2.3SPOT GENADR 600SFCS

L RESTART TABLES

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0092	REF	1		01,2033	75173 0		-GENADR STATEINT
0093	REF	3	LAST 226	E3,1554			EBANK= RRECTCSM
0094	REF	2	LAST 240	01,2034	26063 0		BBCDN STATEINT
0095				01,2035	05000 1	2.5SPCT	CCT 05000
0096	REF	4	LAST 240	E3,1554			EBANK= RRECTCSM
0097	REF	1		01,2036	02613 1		2CADR STATINT1
0097	REF	1		01,2037	26062 0		
0098				01,2040	02734 0	2.7SPCT	DEC 1500
0099	REF	3	LAST 188	E7,1456			EBANK= LCSCCUNT
0100	REF	1		01,2041	75533 0		-2CADR P21LEMC1
0100	REF	1		01,2042	27710 1		
0101				01,2043	14000 1	2.11SPCT	CCT 14000
0102	REF	3	LAST 147	E7,1762			EBANK= P21TIME
0103	REF	1		01,2044	02414 1		2CADR P25LEM1
0103	REF	1		01,2045	50067 0		
0104				01,2046	10000 0	2.13SPCT	CCT 10000
0105	REF	4	LAST 240	E7,1456			EBANK= LCSCCUNT
0106	REF	1		01,2047	02223 0		2CADR RELINLS
0106	REF	1		01,2050	54067 1		
0107				01,2051	26000 0	2.15SPCT	CCT 26000
0108	REF	5	LAST 240	E7,1456			EBANK= LCSCCUNT
0109	REF	1		01,2052	02654 1		2CADR R22PSTRT
0109	REF	1		01,2053	50067 0		
0110				01,2054	77777 0	2.17SPCT	CCT 77777
0111	REF	1		E7,1700			EBANK= VCPREV
0112	REF	1		01,2055	75436 1		-2CADR REDD2.17
0112	REF	1		01,2056	03710 1		
0113				01,2057	00031 0	2.21SPCT	DEC 25
0114	REF	3	LAST 239	E7,1515			EBANK= DVCNTR
0115	REF	1		01,2060	75771 1		-2CADR R10,R11
0115	REF	1		01,2061	05710 1		
R0116	ANY MORE GROUP 2.CDD RESTART VALUES SHOULD GO HERE.						
0117	REF	3	LAST 239	01,2016		3.2SPCT	EQUALS 1.2SPCT
R0118	ANY MORE GROUP 3.EVEN RESTART VALUES SHOULD GO HERE						
0119	REF	1		01,2062	76355 0	3.3SPCT	-GENADR ZOCMTIME
0120	REF	4	LAST 240	E7,1515			EBANK= DVCNTR
0121	REF	1		01,2063	74110 1		-2CADR ZOOM
0121	REF	1		01,2064	05710 1		
01212				01,2065	20000 0	3.5SPCT	CCT 20000
01214	REF	4	LAST 201	E7,1453			EBANK= TTUGO
01216	REF	1		01,2066	02540 1		2CADR S40.13
01216	REF	1		01,2067	56067 0		
R0122	ANY MORE GROUP 3.CDD RESTART VALUES SHOULD GO HERE						
0123				01,2070	04704 0	4.2SPCT	DEC 2500
0124	REF	5	LAST 240	E7,1453			EBANK= TTUGO

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0125	REF	1		01,2071	75423 0	-2CADP	TIG-5
0125	REF	1		01,2072	03710 1		
0126				01,2073	77777 0	CCT	77777
0127	REF	6	LAST 240	07,1453		EBANK=	TTCGC
0128	REF	1		01,2074	75433 1	-2CADP	RED04.2
0128	REF	1		01,2075	03710 1		

R0129 ANY MORE CRUP 4. EVEN RESTART VALUES SHOULD GO HERE

0130				01,2076	25000 0	4.3SPCT	CCT 25000
0131	REF	5	LAST 240	07,1515		EBANK=	DVCNTR
0132	REF	1		01,2077	03547 1	2CADP	GCABCR
0132	REF	1		01,2100	64067 1		
0133				01,2101	00062 0	4.5SPCT	DEC 50
0134	REF	7	LAST 241	07,1453		EBANK=	TTCGC
0135	REF	1		01,2102	75211 1	-2CADP	ULLAGEFF
0135	REF	1		01,2103	03710 1		
0136				01,2104	00764 1	4.7SPCT	DEC 500
0137	REF	6	LAST 241	07,1515		EBANK=	DVCNTR
0138	REF	1		01,2105	75370 1	-2CADP	TIG-0
0138	REF	1		01,2106	03710 1		

0139	REF	3	LAST 195	01,2107	76260 1	4.11SPCT	GENADP TIG +1
0140	REF	7	LAST 241	07,1515		EBANK=	DVCNTR
0141	REF	1		01,2110	74231 1	-2CADP	ENGOFISK
0141	REF	1		01,2111	03710 1		
0142				01,2112	12000 1	4.13SPCT	CCT 12000
0143	REF	2	LAST 140	07,1462		EBANK=	TRKMKCNT
0144	REF	1		01,2113	03227 0	2CADP	POSTBLRN
0144	REF	1		01,2114	74067 0		

0145				01,2115	00764 1	4.15SPCT	DEC 500
0146	REF	8	LAST 241	07,1453		EBANK=	TTCGC
0147	REF	1		01,2116	75477 1	-2CADP	TIG-31
0147	REF	1		01,2117	03710 1		
0148				01,2120	77777 0	4.17SPCT	CCT 77777
0149	REF	8	LAST 241	07,1515		EBANK=	DVCNTR
0150	REF	2	LAST 241	01,2121	75423 0	-2CADP	TIG-5
0151				01,2122	03710 1		
0151				01,2123	13000 0	4.21SPCT	CCT 13000
0152	REF	2	LAST 124	05,1730		EBANK=	STAR
0153	REF	1		01,2124	03012 1	2CADP	R51.1 +1
0153	REF	1		01,2125	30065 1		
0154				01,2126	77777 0	4.23SPCT	CCT 77777
0155	REF	9	LAST 241	07,1515		EBANK=	DVCNTR
0156	REF	1		01,2127	75345 1	-2CADP	IGNITION
0156	REF	1		01,2130	03710 1		
0157	REF	3	LAST 239	01,2131	01477 1	4.25SPCT	GENADP SAVET-30
0158	REF	1		01,2132	75535 0	-GENADP	TIG-35
0159	REF	4	LAST 241	07,1477		EBANK=	SAVET-30
0160	REF	2	LAST 241	01,2133	74067 0	BRCN	TIG-35

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0161				01,2134	52777 1	4.27SPCT	CCT	52777
0162	REF	10	LAST 241	E7,1515			EBANK=	DVCNTR
0163	REF	1		01,2135	02173 1		2CADR	P70A
0163	REF	1		01,2136	42067 0			
0164				01,2137	52777 1	4.31SPOT	OCT	52777
0165	REF	11	LAST 242	E7,1515			EBANK=	DVCNTR
0166	REF	1		01,2140	02173 1		2CADR	P71A
0166	REF	1		01,2141	42067 0			
0167				01,2142	46777 1	4.33SPCT	CCT	46777
0168	REF	12	LAST 242	E7,1515			EBANK=	DVCNTR
0169	REF	2	LAST 225	01,2143	02024 0		2CADR	GCPCCFIX
0169				01,2144	10067 1			
0170				01,2145	46777 1	4.35SPOT	OCT	46777
0171	REF	12	LAST 242	E7,1515			EBANK=	DVCNTR
0172	REF	1		01,2146	05655 1		2CADR	GCPCDCCC
0172	REF	1		01,2147	04067 1			
0173				01,2150	52777 1	4.37SPCT	CCT	52777
0174	REF	1		E7,1455			EBANK=	WHICH
0175	REF	1		01,2151	02375 1		2CADR	CCMFAL
0175	REF	1		01,2152	74067 0			

R0176 ANY MORE 4.CCD RESTART VALUES SHOULD GO HERE.

0177				01,2153	22000 1	5.2SPCT	CCT	22000
0178	REF	14	LAST 242	E7,1515			EBANK=	DVCNTR
0179	REF	1		01,2154	02463 1		2CADR	NORMLIZE
0179	REF	1		01,2155	46067 1			
0180				01,2156	00310 0		DEC	200
0181	REF	15	LAST 242	E7,1515			EBANK=	DVCNTR
0182	REF	1		01,2157	74166 0		-2CADR	PEREADAC
0182	REF	1		01,2160	01710 0			
0183				01,2161	00310 0	5.4SPCT	DEC	200
0184	REF	16	LAST 242	E7,1515			EBANK=	DVCNTR
0185	REF	2	LAST 242	01,2162	74166 0		-2CADR	PEREADAC
0185				01,2163	01710 0			
0186				01,2164	20000 0		CCT	20000
0187	REF	17	LAST 242	E7,1515			EBANK=	DVCNTR
0188	REF	1		01,2165	02206 1		2CADR	SEPVICER
0188	REF	1		01,2166	66067 0			

R0189 ANY MORE GROUP 5.EVEN RESTART VALLES SHOULD GO HERE

0190				01,2167	00310 0	5.3SPOT	DEC	200
0191	REF	18	LAST 242	E7,1515			EBANK=	DVCNTR
0192	REF	3	LAST 242	01,2170	74166 0		-2CADR	PEREADAC
0192				01,2171	01710 0			
0193				01,2172	77777 0	5.5SPCT	CCT	77777
0194	REF	19	LAST 242	E7,1515			EBANK=	DVCNTR
0195	REF	1		01,2173	74326 0		-2CADR	RFD05.5
0195	REF	1		01,2174	01710 0			

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0196					01,2175	77777 0	5.7SPOT	CCT	77777	
0197	REF	20	LAST	242	07,1515			EBANK=	DVCNTR	
0198	REF	1			01,2176	74361 0		-2CADR	B1B1BIAS	
0199	REF	1			01,2177	01710 0				

R0199 ANY MORE GROUP 5.CDD RESTART VALUES SHOULD GO HERE

0200	REF	4	LAST	240	01,2016		6.2SPOT	EQUALS	1.2SPOT	
0201					01,2210	00144 0	6.3SPCT	DEC	100	
0202	REF	6	LAST	203	07,1441			EBANK=	T1G	
0203	REF	1			01,2201	75054 1		-2CADR	CLOCKTASK	
0204	REF	1			01,2202	02710 1				

0204					01,2203	30000 1	6.5SPCT	CCT	30000	
0205	REF	2	LAST	112	03,1706			EBANK=	TEPHEN	
0206	REF	1			01,2204	02562 0		2CADR	TIMEC1DR	
0206	REF	1			01,2205	10063 0				
0207					01,2206	17000 1	6.7SPCT	CCT	17000	
0208	REF	2	LAST	240	07,1700			EBANK=	VGPREV	
0209	REF	1			01,2207	03354 0		2CADR	RFD06.7	
0209	REF	1			01,2210	74067 0				

PROTECT INCREMENTING OF TIME2, TIME1 BY
P27(UPDATE PROGRAM) VIA V70 OR V72.

L ACTMARK

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0001 12,2000 BANK 12
 0002 REF 1 07,2000 SETLCC ACTMARK1
 0003 07,2000 BANK

0004 REF 2 LAST 146 07,1551 EBANK= XYMARK
 0005 REF 1 COUNT* \$\$/MARK

0006 07,2000 0 0004 0 ACTMARK IN-INT
 0007 REF 2 LAST 223 07,2001 11'307 0 CCS MARKSTAT SEE IF ACTMARK BUSY
 0008 07,2002 0 2004 1 TC +2 MARK SYSTEM BUSY-DC ALARM
 0009 REF 1 07,2003 0 2006 0 TC EXTVECHK
 0010 REF 1 07,2004 0 5642 1 TC PCODGC
 0011 07,2005 20105 1 CCT 20105

0013 REF 2 LAST 170 07,2006 3 6245 1 EXTVBCHK CAF SIX SEE IF EXT. VERB WORKING
 0014 REF 2 LAST 223 07,2007 7 1043 0 MASK EXTVBACT
 0015 REF 51 LAST 232 07,2010 10 000 0 CCS A
 0016 REF 1 07,2011 1 2044 1 TCF MKABCRT YES-ABCRT

0017 REF 20 LAST 185 07,2012 3 4752 0 CAF BIT2 NO-DISALLOW SOME EXTENDED VERB ACTION
 0018 REF 3 LAST 244 07,2013 27'043 0 ADS EXTVBACT BIT2 RESET IN ENDMARK
 0019 REF 3 LAST 223 07,2014 10 400 1 MKVAC CCS VAC1USE LOCK FOR A VAC AREA-CC ABRCT IF
 0020 REF 1 07,2015 1 2031 0 TCF MKVACFNC NONE AVAILABLE
 0021 REF 2 LAST 222 07,2016 10 454 0 CCS VAC2USE
 0022 REF 2 LAST 244 07,2017 1 2031 0 TCF MKVACFND
 0023 REF 2 LAST 222 07,2020 10 530 0 CCS VAC3USE
 0024 REF 3 LAST 244 07,2021 1 2031 0 TCF MKVACFNC
 0025 REF 2 LAST 222 07,2022 10 604 1 CCS VAC4USE
 0026 REF 4 LAST 244 07,2023 1 2031 0 TCF MKVACFNC
 0027 REF 2 LAST 222 07,2024 10 660 0 CCS VAC5USE
 0028 REF 5 LAST 244 07,2025 1 2031 0 TCF MKVACFND
 0029 REF 1 07,2026 52 134 0 EXCH BLF2
 00292 REF 1 07,2027 0 5706 0 TC BAILQUT1 ALL VAC AREAS OCCUPIED - ABRCT.
 0030 07,2030 31207 0 CCT 31207

0031 REF 3 LAST 188 07,2031 6 4752 0 MKVACFNC AD TWO
 0032 REF 3 LAST 244 07,2032 55'307 0 TS MARKSTAT STCRF VAC ADR IN LOW 9 OF MARKSTAT

0033 REF 17 LAST 236 07,2033 3 4755 1 CAF ZERO
 0034 REF 4 LAST 244 07,2034 51'307 1 INDEX MARKSTAT
 0035 07,2035 53'777 0 TS U -1 ZERO IN VACUSE REG TO SHOW VAC OCCUPIED

0036 REF 2 LAST 182 07,2036 3 5025 0 CAF PRIQ15
 0037 REF 2 LAST 212 07,2037 1 5105 0 TC FINDVAC SET UP JCB FOR GETDAT
 0038 REF 2 LAST 244 07,1551 EBANK= XYMARK
 0039 REF 1 07,2040 02'63 0 2CADR GETDAT
 0039 REF 1 07,2041 16067 1

0040 07,2042 0 0003 1 PELINT
 0041 REF 1 07,2043 1 4631 0 TCF SWRETUPN

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0042	REF	2	LAST	244	07,2 44	52 134 0	MKABORT	DXCH	FLF2	
00422	REF	2	LAST	244	07,2 45	0 5706 0		TC	BATLOUT1	CONFLICT WITH EXTENDED VFRB
0043					07,2 46	31211 1		CCT	31211	
0044	REF	18	LAST	244	07,2 47	3 4755 1	MKRELEAS	CAF	ZERC	
0045	REF	5	LAST	244	07,2 48	57 307 1		XCH	MARKSTAT	SFT MARKSTAT TO ZERO
0046	REF	1			07,2 51	7 5004 1		MASK	LCW9	PICK UP VAC AREA ADR
0047	REF	52	LAST	244	07,2 52	17 800 0		CCS	A	
0048	REF	53	LAST	245	07,2 53	53 000 1		INDEX	A	
0049					07,2 54	54 000 0		TS	0	SHOW MKVAC AREA AVAILABLE
0050	REF	9	LAST	228	07,2 55	3 4753 1		CAF	ONE	
0051	REF	10	LAST	231	07,2 56	0 4674 0		TC	IBKCALL	
0052	REF	1			07,2 57	17 657 0		CADR	GOODEND	GC WAKE UP CALLING JOB

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00521	REF	19	LAST	245	07,2106	3 4755	I	KILLACT	CAF	ZERC	
00522	REF	4	LAST	244	07,2101	55'043	0		TS	EXTVBACK	TERMINATE ACTMARK-ALLOW EXT VERR
00523	REF	2	LAST	218	07,2102	0 6001	0		TC	GCTCPCCF	
0053	REF	6	LAST	245	07,2103	4 1207	0	GETDAT	CS	MARKSTAT	SET BIT12 TO DISCOURAGE MARKRUPT
00531	REF	16	LAST	222	07,2104	7 4740	1		MASK	BIT12	BIT12 RESET AT GETMARK
00532	REF	7	LAST	246	07,2105	27'307	0		ADS	MARKSTAT	
00533	REF	1			07,2106	3 2330	0		CAF	VOIN71	DISPLAY DETENT AND STAR CODE
0054	REF	9	LAST	226	07,2107	1 4616	1		TC	BANKCALL	
0055	REF	2	LAST	208	07,2108	20334	1		CADR	GCMARKF	
0056	REF	1			07,2101	1 2100	1		TCF	KILLACT	V34-DCES GOTOPDOH
0057	REF	1			07,2102	1 2174	1		TCF	DCPAT	V33-PROCESS-USE THIS STAR FOR MARKS
0058	REF	2	LAST	244	07,2103	1 2063	1	ENTERDAT	TCF	GETDAT	ENTER-REDISPLAY STAR CODE
0069	REF	1			07,2104	3 7747	1	DCDAT	CAF	HIGH9	PICK DETENT CODE FROM BITS7-9 OF AOTCCODE
0070	REF	2	LAST	197	07,2105	7 0734	0		MASK	ACTCCDF	AND SEE IF CODE 1 TO 6
0071					07,2106	1 0006	1		EXTEND		
0072	REF	15	LAST	165	07,2107	7 4743	1		MP	BIT9	
0073	REF	4	LAST	244	07,2108	55'551	0		TS	XYMARK	STORE DETENT
0074					07,2101	0 0006	1		EXTEND		
0075	REF	3	LAST	246	07,2102	6 2063	0		BZMF	GETDAT	CCAS CALIBRATION CODE-NO GOOD HERE
0076	REF	1			07,2103	6 5650	1		AD	NFG7	SEE IF DETENT 7 FOR CCAS
0077					07,2104	1 0006	1		EXTEND		
0078	REF	1			07,2105	1 2107	1		BZF	CCCE7	
00785	REF	1			07,2106	1 2123	1		TCF	CODE1106	
0079	REF	1			07,2107	3 2331	1	CCCE7	CAF	VP6N87*	CCCE 7, CCAS SIGHTING, GET OPTIC AXIS
0080	REF	10	LAST	246	07,2110	0 4616	1		TC	BANKCALL	AZ AND EL OF SIGHTING DEVICE FROM ASTRO
0081	REF	3	LAST	246	07,2111	20334	1		CADR	GCMARKF	
0082	REF	2	LAST	246	07,2112	1 2060	1		TCF	KILLACT	V34-DCES GCTCPCCF
0083					07,2113	1 2115	1		TCF	+2	PRCCFED
0084	REF	2	LAST	246	07,2114	1 2107	1		TCF	CCCE7	ON ENTER, RECYCLE
00841					07,2115	0 0006	1		EXTEND		
0085	REF	2	LAST	108	07,2116	3 1345	1		CCA	AZ	PICK LP AZ AND EL IN SP 2S COMP
0086	REF	1			07,2117	50 120	1		INDEX	FIXLCC	
0087					07,2120	52 011	0		EXCH	8D	STORE IN 8D AND 9D OF LOCAL VAC
0095	REF	20	LAST	246	07,2121	3 4755	1		CAF	ZERC	BACKUP SYSTEM TO BE USED
0096	REF	1			07,2122	1 2137	1		TCF	CCASCCDE	ZERO APPARENT ROTATION
0097	REF	5	LAST	246	07,2123	51'551	1	CODE1106	INDEX	XYMARK	INDEX ACT POSITION BY DET CODE
0098	REF	1			07,2124	3 1411	1		CA	AOTFL -1	
0099	REF	2	LAST	246	07,2125	50 120	1		INDEX	FIXLCC	
0100					07,2126	54 011	0		TS	9D	STORE ELEVATION IN VAC+9D
0101	REF	6	LAST	246	07,2127	51'551	1		INDEX	XYMARK	INDEX DET CODE 1,2 OR 3

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0102	REF	2	LAST	145	07,2131	3 1403 1	CA	ACTAZ -1	
0103	REF	3	LAST	246	07,2131	53 120 1	INDEX	FIXLCC	
0104					07,2132	54 010 1	TS	80	STOPE AZIMUTH IN VAC+90
0105	REF	3	LAST	247	07,2133	3 1405 1	CA	ACTAZ +1	COMPENSATION FOR APPARENT ROTATION OF
0106					07,2134	0 0006 1	EXTEND		ACT FIELD OF VIEW IN LEFT AND RIGHT
0107	REF	4	LAST	247	07,2135	5 0120 1	INDEX	FIXLCC	DETENTS IS STORED IN VAC +100 IN SP
0108					07,2136	20 010 1	MSL	80	PRECISION ONES COMPLEMENT
0109	REF	5	LAST	247	07,2137	50 120 1	COASCODE INDEX	FIXLCC	
0110					07,2140	54 012 0	TS	100	ROT ANGLE
0111	REF	4	LAST	229	07,2141	0 6042 1	TC	INTPRET	COMPUTE X AND Y PLANE VECTORS

L AOTMARK

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P0112 THE OPTAXIS SUBROUTINE COMPUTES THE X AND Y MARK PLANE VEC'S AND
 R0113 AND ROTATES THEM THRU THE APPARENT FIELD OF VIEW ROTATION UNIQUE TO AOT
 R0114 OPTAXIS USES OANB TO COMPUTE THE OPTIC AXIS
 R0115 INPUT-AZIMUTH ANGLE IN SINGLE PREC AT CDU SCALE IN 8D OF JOB VAC
 R0116 ELEVATION ANGLE IN SINGLE PREC AT CDU SCALE IN 9D OF JOB VAC
 R0117 ROTATION ANGLE IN SINGLE PREC IS COMP SCALED BY FI IN 10D OF VAC
 R0118 OUTPUT-OPTIC AXIS VEC IN NB COORDS IN SCAXIS
 R0119 X-MARK PLANE 1/4VEC IN NB COORDS AT 18D OF JOB VAC
 R0120 Y-MARK PLANE 1/4VEC IN NB COORDS AT 12D OF JOB VAC

0121			07,2142	77624 1	OPTAXIS CALL	GO COMPUTE OA AND X AND Y PLANE VEC'S
0122	REF	1	07,2143	10520 1	CANB	
0123			07,2144	70525 0	SLCAD SR1	LOAD APP ROTATION IN CNFS COMP
0124			07,2145	00013 0	12D	RESCALE BY 2PI
0125			07,2146	73406 1	FLSH SIN	1/2SIN(ROCT) 0-1
0126			07,2147	71525 0	PDDL COS	
0127			07,2150	74206 0	PUSH VXSC	1/2COS(ROCT) 2-3
0128			07,2151	00023 0	18D	
0129			07,2152	74325 0	PDDL VXSC	1/4COS(ROCT)UYF 4-5
0130			07,2153	00001 0	0	
0131			07,2154	00031 0	24D	1/4SIN(ROCT)UXF
0132			07,2155	45445 0	EVSU STADR	LP 4-5
0133			07,2156	63762 1	STCDL 12D	YFNB=1/4(COS(ROCT)UYF-SIN(ROCT)UXP)
0134			07,2157	65361 0	VXSC PDDL	LP 2-3 LP 0-1 FOR EXCHANGE
0135			07,2160	00031 0	24D	1/4COS(ROCT)UXP PUSH 0-5
0137			07,2161	53361 0	VXSC VAD	1/4SIN(ROCT)UYF
0138			07,2162	00023 0	18D	UP 0-5
01381			07,2163	77626 0	STADR	
0139			07,2164	53754 1	STCDL 18D	XPNB=1/4(COS(ROCT)UXF+SIN(ROCT)UYF)
0140	REF	1	07,2165	24007 0	LC6ZEPDS	INITIALIZE AVE STAR VEC ACCUMULATOR
0141	REF	7 LAST	07,2166	02715 0	STORE STARAC +6	
0142			07,2167	77776 -1	EXIT	
0143	REF	1	07,2170	1 2272 1	TCF GETMKS	

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R0144 THE CANB SUBROUTINE COMPLETES THE OPTIC AXIS OF THE SIGHTING INSTRUMENT
 R0145 FROM AZIMUTH AND ELEVATION INPUT FROM THE ASTRONAUT.
 R0146 INPUT- AZIMUTH ANGLE IN SINGLE PREC 2S COMP IN 8D OF JCB VAC
 R0147 ELEVATION ANGLE IN SINGLE PREC 2S COMP IN 9D OF VAC
 R0148 OUTPUT- OPTIC AXIS IN NB COORDS. IN SCAXIS
 P0149 X-PLANE 1/2VEC IN NE COORDS AT 24D OF VAC
 P0150 Y-PLANE 1/2VEC IN NB COORDS AT 18D OF VAC

01501 05,3400 BANK 05
 01502 RFF 1 04,2000 SETLOC ANTMARK2
 01504 04,2520 BANK

01506 RFF 1 COUNT# \$1/MARK

0151 04,2520 44001 0 CANB SETPC STC
 0152 04,2521 00001 0 0
 0153 RFF 2 LAST 124 04,2522 02736 1 GCTR STORE RETURN
 0154 04,2523 47135 0 SLCAD RTE
 0155 04,2524 00012 1 9D PICK UP SP FLV
 0156 RFF 1 04,2525 21577 1 CCULGIC
 0157 04,2526 71406 0 FLUSH CCS
 0158 04,2527 73525 1 PDDL SIN 1/2COS(FLV) PD 0-1
 01581 04,2530 77626 0 STADR
 0159 RFF 4 LAST 147 04,2531 60012 1 STCCL SCAXIS CAX=1/2SIN(ELV)
 0160 04,2532 00011 1 8D PICK UP AZ SP
 0161 04,2533 77634 0 RTE
 0162 RFF 2 LAST 249 04,2534 21577 1 CCULGIC
 0163 04,2535 71406 0 PUSF COS
 0164 04,2536 00025 0 STORE 2ND STORE UYP(Y) 21-21
 0165 04,2537 73525 1 PDDL SIN 1/2COS(AZ) PD 2-3
 0166 04,2540 57406 1 PUSF DCCMP PUSF 1/2SIN(AZ) 4-5
 0167 04,2541 14027 1 STCCL 22D STORE UYP(Z) 22-23
 0168 RFF 2 LAST 248 04,2542 24007 0 LC6ZEROS
 0169 04,2543 14023 1 STCCL 18D STORE UYP(X) 18-19 LP 4-5
 0170 04,2544 72405 0 DMP SL1
 0171 04,2545 00001 0 0
 0172 RFF 5 LAST 249 04,2546 17767 1 STCCL SCAXIS +2 CAY=1/2COS(ELV)SIN(AZ)
 0173 04,2547 72405 0 DMP SL1 LP 2-3
 0174 04,2550 77626 0 STADR LP 0-1
 0175 RFF 6 LAST 249 04,2551 57406 1 STCCL SCAXIS +4 CAZ=1/2COS(ELV)COS(AZ)
 0176 04,2552 00023 0 18D LOAD LYP VEC
 0177 04,2553 53435 0 VVV UNIT
 0178 RFF 7 LAST 249 04,2554 03765 0 SCAXIS UXP VEC=LYP X CA
 0179 04,2555 00031 0 STORE 24D STORE UXP
 0180 04,2556 77650 1 GCTR
 0181 RFF 3 LAST 249 04,2557 02736 1 GCTR

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R0182 SURFSTAR COMPUTES A STAR VECTOR IN SM COORDINATES FOR LUNAR
 R0183 SURFACE ALIGNMENT AND EXITS TO AVSIT TO AVERAGE STAR VECTORS.
 R0184 GIVEN X-MARK PLANE 1/4 VEC IN NB AT 18D OF LOCAL VAC
 R0185 Y-MARK PLANE 1/4 VEC IN NB AT 12D OF LOCAL VAC
 R0186 CURSOR SP 2CCMP AT POSITION 1 OF INDEXED MARKVAC
 R0187 SPIRAL SP 2CCMP AT POSITION 3 OF INDEXED MARKVAC
 R0188 CDUY,Z,X AT POSITIONS 0,2,4 OF INDEXED MARKVAC
 0189 15,2000 BANK 15
 0190 REF 1 15,2000 SETLCC P57S
 0191 15,2000 BANK
 0192 REF 1 CCUNT* \$\$\$/R59

01921	15,2000	77773	1	SURFSTAR	VLOAD*		
01922	15,2001	00001	0		0,1		PUT X-MARK CDUS IN CDLSFOT FOR TRG*ABSM
01923	REF 4	15,2002	00766	C	STORE	CDLSFOT	
0193	15,2003	47133	0		SLCAD*	RTB	
0194	15,2004	00002	0		1,1		PICK UP YRGT
0195	REF 3	15,2005	21577	1		CDULOGIC	
0196	15,2006	00031	0		STORE	24D	STORE CURSOR FOR SPIRAL CCMP (REVS)
01961	15,2007	77654	0		EZE		
01962	REF 1	15,2010	15171	1		YZCHK	IF YRGT ZERO-SEE IF SRGT ZERO
0197	15,2011	71406	0	JUSTZY	PUSH	COS	
0198	15,2012	73525	1		PDDL	SIN	1/2COS(YRGT) C-1
0199	15,2013	65361	0		VXSC	PDDL	UP 0-1 1/8SIN(YRGT)UXP 0-5
0200	15,2014	00023	0			18D	
0201	15,2015	52361	1		VXSC	VSU	UP 0-5
02011	15,2016	00015	0			12D	LYP
0202	15,2017	47255	0		UNIT	VXV	
0203	REF 8	15,2020	03765	0		SCAXIS	
0204	15,2021	41455	0		UNIT	PUSH	
0205	15,2022	47133	0		SLCAD*	RTB	
0206	15,2023	00004	0		3,1		PICK UP SPIRAL
0207	REF 4	15,2024	21577	1		CDULOGIC	
0208	15,2025	00033	1		STORE	26D	STORE SPIRAL (REVS)
0209	15,2026	43225	0		DSU	DAD	
0210	15,2027	00031	0			24D	
0211	REF 1	15,2030	32047	0		ABCTCNE	
0212	15,2031	77605	1		EMP		
0213	REF 1	15,2032	32466	1		DF1/12	
0214	15,2033	00033	1		STORE	26D	SEP=(360 + SPIRAL - CURSOR)/12
0215	15,2034	74356	1		SIN	VXSC	UP 0-5
0216	15,2035	65372	1		VSL1	PDDL	1/2SIN(SEP)(UPP X OA) 0-5
0217	15,2036	00033	1			26D	
0218	15,2037	74346	0		CCS	VXSC	
0219	REF 9	15,2040	03765	0		SCAXIS	
0220	15,2041	53372	1		VSL1	VAD	UP 0-5
0221	15,2042	45056	0	JUSTCA	UNIT	CALL	
0222	REF 1	15,2043	47666	1		TRG*ABSM	
0224	15,2044	34031	1		STCALL	24D	STAR VEC IN SM
0225	REF 1	15,2045	16276	0		AVFIT	CC AVERAGE

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0226			1F,2046	37777 1	AEDUTONE 2DEC	.59999999	
0226			15,2047	37775 0			
0227	REF	1	15,2465		DP1/12	EQUALS DEG30	.08333333
0228			07,2171		BANK	7	
0229	REF	2	07,2000		SETLOC	ACTMARK1	
0230			07,2171		BANK		
0231	REF	2	LAST 244 TO 246:	121 121*	COUNT*	\$1/MARK	
02311			07,2171	53133 0	YZCHK	SLOAD* BZF	YPCT ZERO AND IF SPCT ZERO FORCE STAR
02312			07,2172	00004 0		3,1	ALONG OPTIC AXIS
02313	REF	1	07,2173	16177 1		YSZFRF	
02314			07,2174	52145 0	DLOAD	GOTO	
02315			07,2175	00001 0		240	
02316	REF	1	07,2176	32011 0		JLSTZY	SPCT ACT ZERO-CONTINUE NORMALLY
02317			07,2177	52175 0	YSZCRC	VLOAD	GOTO
02318	REF	10	LAST 250	07,2200		SCAXIS	
02319	REF	1	07,2201	32042 0		JLSTCA	

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P0232 THE GETMKS ROUTINE INITIALIZES THE SIGHTING MARK PROCEDURE

0233	REF	21	LAST	246	07,2202	3 4755 1	GETMKS	CAF	ZERO	INITIALIZE MARK ID REGISTER AND MARK CNT
0234	REF	7	LAST	246	07,2203	55'551 0		TS	XYMARK	
0235	REF	2	LAST	146	07,2204	55'550 1		TS	MARKCNT	
0236	REF	2	LAST	245	07,2205	3 5614 0		CAF	LOW9	ZERO BITS10 TO 15 RETAINING MKVAC ADR
0237	REF	8	LAST	246	07,2206	7 1307 0		MASK	MARKSTAT	
0238	REF	9	LAST	252	07,2207	55'377 0		TS	MARKSTAT	
0241	REF	1			07,2210	3 2621 0		CAF	MKB54*	DISPLAY VB54 INITIALLY
0242	REF	11	LAST	246	07,2211	1 4616 1	PASTIT	TC	BANKCALL	
0243	REF	1			07,2212	20345 1		CAFR	COMARK4	
0244	REF	3	LAST	246	07,2213	1 2760 1		TCF	KILLACT	V34-DCES GETCFECH
0245	REF	1			07,2214	1 2216 1		TCF	MARKCHEX	VB23-PROCEED, GET MARKS, COMPLETE LCS
0246	REF	4	LAST	246	07,2215	1 2063 1		TCF	GETDAT	ENTER-RECYCLE TO V01N71
0251	REF	17	LAST	252	07,2216	4 1307 0	MARKCHEX	CS	MARKSTAT	SET BIT12 TO DISCOURAGE MARKRUPT
0252	REF	17	LAST	246	07,2217	7 4740 1		MASK	BIT12	
0253	REF	11	LAST	252	07,2220	27'307 0		ADS	MARKSTAT	
0254	REF	3	LAST	252	07,2221	7 5004 1		MASK	LOW9	
0255	REF	8	LAST	252	07,2222	55'551 0		TS	XYMARK	JAM MARK VAC ADR IN XYMARK FOR AVESTAR
0256	REF	22	LAST	252	07,2223	3 4755 1		CAF	ZERO	
0257	REF	2	LAST	146	07,2224	55'552 0		TS	MKDEX	SET MKDEX ZERO FOR LCS VEC CNTR
0258	REF	12	LAST	252	07,2225	3 1307 1		CA	MARKSTAT	
0259	REF	1			07,2226	7 5015 1		MASK	PRI03	SEE IF LAST MK PAIR COMPLETE
0260	REF	17	LAST	233	07,2227	54 001 1		TS	L	
0261	REF	2	LAST	252	07,2230	3 5015 0		CAF	PRIC3	BITS10 AND 11
0262					07,2231	0 0006 1		EXTEND		
0263	REF	8	LAST	217	07,2232	06 001 0		RXC	LCHAN	
0264					07,2233	0 0006 1		EXTEND		
0265	REF	1			07,2234	1 2241 0		BZF	AVESTAR	LAST PAIR COMPLETE-CC COMPLETE LCS
0266	REF	3	LAST	252	07,2235	11'550 1	CNTCHK	CCS	MARKCNT	NO PAIR SHOWING-SEE IF PAIR IN HOLD
0267					07,2236	1 2240 1		TCF	+2	PAIR BURIED-DECREMENT COUNTER
0268	REF	1			07,2237	1 2325 0		TCF	MKALARM	NO PAIR-ALARM
0269	REF	4	LAST	252	07,2240	55'550 1		TS	MARKCNT	STORE DECREMENTED COUNTER
0270	REF	18	LAST	252	07,2241	3 4740 0	AVESTAR	CAF	BIT12	INITIALIZE MKDEX FOR STAR LCS COUNTER
0271	REF	3	LAST	252	07,2242	27'552 0		ADS	MKDEX	MKDEX WAS INITIALIZED ZERO IN MARKCHEX
0272	REF	5	LAST	252	07,2243	4 1550 1		CS	MARKCNT	
0273					07,2244	0 0006 1		EXTEND		
0274	REF	3	LAST	244	07,2245	7 6245 0		MP	SIX	GET C(L) = - 6 MARKCNT
0275	REF	9	LAST	252	07,2246	4 1551 0		CS	XYMARK	
0276	REF	18	LAST	252	07,2247	6 0001 0		AP	L	ADD - MARK VAC ADR SET IN MARKCHEX
0277	REF	6	LAST	247	07,2250	50 120 1		INDEX	FIXLCC	
0278	REF	1			07,2251	54 046 1		TS	X1	JAM - CCL ADR OF X-MARK IN X1
0279	REF	7	LAST	252	07,2252	3 0120 1		CA	FIXLCC	SET PC POINTER TO ZERO
0280	REF	1			07,2253	54 166 1		TS	PUSHLCC	
0281	REF	5	LAST	247	07,2254	0 6042 1		TC	INTPRET	

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0282					07,2255	76414 0	PCN	VLCAD*		
0283	REF	3	LAST	237	07,2256	74397 1		SUPFLAC		IF ON SURFACE COMPUTE VEC AT SLRSTAR
0284	REF	1			07,2257	32000 0		SUPSTAR		
0285					07,2260	00012 0		1,1		PUT Y-MARK CCLS IN CDUSPCT FOR TRG*NBSM
0286	REF	5	LAST	250	07,2261	24766 0	STCVL	CDUSPCT		
0287					07,2262	00015 0		120		LOAD Y-PLANE VECTOR IN NP
0288					07,2263	77624 1	CALL			
0289	REF	2	LAST	250	07,2264	47666 1		TRG*NBSM		CONVERT IT TO STABLE MEMBER
0290					07,2265	76606 0	PLSH	VLCAD*		
0291					07,2266	00001 0		0,1		PUT X-MARK CCLS IN CDUSPCT FOR TRG*NBSM
0292	REF	6	LAST	252	07,2267	24766 0	STCVL	CDUSPCT		
0293					07,2271	00023 0		180		LOAD X-PLANE VECTOR IN NP
0294					07,2271	77624 1	CALL			
0295	REF	3	LAST	253	07,2272	47666 1		TRG*NBSM		CONVERT IT TO STABLE-MEMBER
0296					07,2273	53435 1	VXV	UNIT		UNIT(XPSM * YPSM)
0297					07,2274	77626 0	STACR			
0298					07,2275	77746 1	STCRF	240		
0301					07,2276	63335 1	AVEIT	SLOAE	PDVL	N(NUMBER OF VECs) IN C-1
0302	REF	4	LAST	252	07,2277	03552 1		MKFEX		
0303					07,2300	00021 0		240		LOAD CURRENT VECTOR
0304					07,2301	70322 0	VSR3	V/SC		
0305					07,2302	00001 0		0		
0306					07,2303	14031 0	STCDL	240		VEC/N
0307					07,2304	00001 0		0		
0308					07,2305	56225 1	DSL	DDV		
0309	REF	1			07,2306	16623 1		DP1/8		(N-1)/N
0310					07,2307	53361 0	VXSC	VAC		
0311	REF	8	LAST	248	07,2310	02715 0		STAPAD +6		ADD VEC TO PREVIOUSLY AVERAGED VECTOR
0312					07,2311	00031 0		240		(N-1)/N AVESTVEC + VEC/N
0313	REF	9	LAST	253	07,2312	02715 0	STORE	STARAD +6		AVERAGE STAR VECTOR
0314	REF	4	LAST	197	07,2313	02767 0	STORE	STARS1V2		
0315					07,2314	77776 1	EXIT			
0316	REF	6	LAST	252	07,2315	111550 1	CCS	MARKCTR		SEE IF ANOTHER MARK PAIR IN MKVAC
0317	REF	2	LAST	252	07,2316	12240 1	TCF	AVESTAR -1		THERE IS-GE GET IT-INCREMENT CCLNTER
0318	REF	5	LAST	232	07,2317	34756 1	CAF	FIVE		NO MORE MARKS-TERMINATE ACTMARK
0319					07,2320	00004 0	INHINT			
0320	REF	7	LAST	188	07,2321	005203 0	TC	WAITLIST		
0321	REF	10	LAST	252	07,1551		FRANK=	XYMARK		
0322	REF	1			07,2322	02047 0	2CADR	MKRELEAS		
0322	REF	1			07,2323	16067 1				
0323	REF	1			07,2324	005472 0	TC	ENDMARK		
0324	REF	11	LAST	228	07,2325	105567 0	MKALARM	TC	ALARM	NOT A PAIR TO PROCESS-GE GETNKS
0325					07,2326	00111 0	TCF	111		
0326	REF	2	LAST	248	07,2327	12202 1	TCF	GETNKS		
0327					07,2330	00317 0	VOIN71	VN	171	
0328					07,2331	01527 0	V6N87*	VN	687	

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03320 MARKRUPT IS ENTERED FROM INTERRUPT LEAD-INS AND PROCESSES CHANNEL 16
 03330 CAUSED BY X,Y MARK OR MARK REJECT OR BY THE RATE OF DESCENT SWITCH

0331	REF	2	LAST	156	07,2332	54 016 1	MARKRUPT	TS	BANKRUPT	
0332	REF	1			07,2333	3 0033 1	CA	CDUY		STORE CDUS AND TIME NOW-THEN SEE IF
0333	REF	5	LAST	138	07,2334	54 063 0	TS	ITEMP3		WE NEED THEM
0334	REF	4	LAST	189	07,2335	3 0034 0	CA	CDUZ		
0335	REF	3	LAST	95	07,2336	54 064 1	TS	ITEMP4		
0336	REF	5	LAST	196	07,2337	3 0032 0	CA	CDUX		
0337	REF	2	LAST	95	07,2340	54 065 0	TS	ITEMP5		
0338					07,2341	0 0036 1	EXTEND			
0339	REF	7	LAST	205	07,2342	3 0025 0	DCA	TIME2		
0340	REF	4	LAST	138	07,2343	52 062 1	DXCF	ITEMP1		
0341	REF	20	LAST	234	07,2344	56 002 0	XCF	Q		
0342	REF	2	LAST	156	07,2345	54 012 0	TS	ORUPT		
0343	REF	1			07,2346	3 2624 0	CAF	QCT34		SEE IF X OR Y MARK OR MKREJECT
0344					07,2347	0 0006 1	EXTEND			
0345	REF	2	LAST	219	07,2350	02 016 1	RAND	NAVKEYIN		
0346	REF	54	LAST	245	07,2351	10 000 0	CCS	A		
0347					07,2352	1 2354 0	TCF	+2		ITS A LIVE CNE-SEE IF ITS WANTED
0348	REF	1			07,2353	1 2404 1	TCF	SCMEKEY		ITS SCME OTHER KEY
0349	REF	19	LAST	252	07,2354	3 4740 0	CAF	BIT12		ARE WE ASKING FOR A MARK
0350	REF	13	LAST	252	07,2355	7 1307 0	MASK	MARKSTAT		
0351	REF	55	LAST	254	07,2356	10 000 0	CCS	A		
0352	REF	8	LAST	191	07,2357	0 5270 1	TC	RESUME		DONT WANT MARK OR MKREJECT-DO NOTHING
0353	REF	14	LAST	254	07,2360	11 3007 0	CCS	MARKSTAT		ARE MARKS BEING ACCEPTED
0354	REF	1			07,2361	1 2365 1	TCF	FINDKEY		THEY ARE-WHICH ONE IS IT
0355	REF	12	LAST	253	07,2362	0 5567 0	TC	ALARM		MARKS NOT BEING ACCEPTED-CC ALARM
0356					07,2363	00112 0	EOT	112		
0357	REF	5	LAST	254	07,2364	0 5270 1	TC	RESUME		
0358	REF	16	LAST	229	07,2365	3 4747 1	FINDKEY	CAF	BIT5	SEE IF MARK REJECT
0359					07,2366	0 0006 1	EXTEND			
0360	REF	3	LAST	254	07,2367	02 016 1	RAND	NAVKEYIN		
0361	REF	56	LAST	254	07,2370	10 000 0	CCS	A		
0362	REF	1			07,2371	1 2461 1	TCF	MKREJ		ITS A MARK REJECT
0363	REF	18	LAST	233	07,2372	3 4750 1	CAF	BIT4		SEE IF Y MARK
0364					07,2373	0 0006 1	EXTEND			
0365	REF	4	LAST	254	07,2374	02 016 1	RAND	NAVKEYIN		
0366	REF	57	LAST	254	07,2375	10 000 0	CCS	A		
0367	REF	1			07,2376	1 2422 0	TCF	YMKRUPT		ITS A Y MARK
0368	REF	13	LAST	88	07,2377	3 4751 0	CAF	BIT3		SEE IF X MARK
0369					07,2400	0 0006 1	EXTEND			
0370	REF	5	LAST	254	07,2401	02 016 1	RAND	NAVKEYIN		

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0371	REF	58	LAST	254	07,2412	1 000 0	CCS	A		
0372	REF	1			07,2413	1 2416 1	TCF	XMKPLPT	ITS A X MARK	
0373	REF	1			07,2414	3 4776 0	SCMFKEY	CAF	OCT140	NOT MARK OR MKREJECT-SEE IF DESCENT BITS
0374					07,2415	0 0076 1		EXTEND		
0375	REF	6	LAST	254	07,2416	02 016 1		RAND	NAVKEYIN	
0376					07,2417	1 0016 1		EXTEND		
0377					07,2418	1 2413 1		BZF	+3	IF NO BITS
0378	REF	6	LAST	231	07,2411	0 4635 0	TC	POSTJUMP	IF DESCENT BITS	
0379	REF	1			07,2412	46455 1	CADR	DESCBITS		
0380	REF	12	LAST	254	07,2413	5567 0	TC	ALARM	AC INFITS IN CHANNEL 16	
0381					07,2414	01113 1	CCT	113		
0382	REF	10	LAST	254	07,2415	0 5270 1	TC	RESUME		
0383	REF	23	LAST	252	07,2416	3 4755 1	XMKRLPT	CAF	ZERO	
0384	REF	12	LAST	169	07,2417	54 170 1		TS	RUPTREG1	SET X MARK STORE INDEX TO ZERO
0385	REF	17	LAST	221	07,2420	3 4742 1		CAF	PIT10	
0386					07,2421	1 2425 1		TCF	+4	
0387	REF	10	LAST	245	07,2422	3 4753 1	YMKRUPT	CAF	CNE	
0388	REF	14	LAST	255	07,2423	54 170 1		TS	RLPTRFG1	SET Y MARK STORE INDEX TO ONE
0389	REF	16	LAST	233	07,2424	3 4741 1		CAF	BIT11	
0390	REF	11	LAST	253	07,2425	551551 0		TS	XYMARK	SET MARK IDENTIFICATION
03901	REF	1			07,2426	0 2514 0	TC	MARKTYPE	SEE IF SURFACE MARK	
03902	REF	1			07,2427	1 2521 1	TCF	SURFSTCR	SURFACE MARK-JUST STORE CCUS	
0391	REF	25	LAST	217	07,2431	3 4736 1		CAF	BIT14	GET A MARK-SEE IF MARK PAIR MADE
0392	REF	15	LAST	254	07,2431	7 1307 0		MASK	MARKSTAT	
0393					07,2432	0 0006 1		EXTEND		
0394	REF	1			07,2433	1 2444 0		BZF	VERIFYMK	NOT A PAIR, NORMAL PROCEDURE
0395	REF	7	LAST	253	07,2434	4 1550 1		CS	MARKCNTR	GOT A PAIR, SEE IF ANOTHER CAN BE MADE
0396	REF	3	LAST	212	07,2435	6 4751 0		AD	FCUR	IF SO, INCREMENT POINTER, CLEAR BITS10,11
0397					07,2436	0 0006 1		EXTEND		
0398	REF	1			07,2437	6 2454 0	PZMF	5MKALARM	HAVE FIVE MARK PAIRS-DONT ALLOW MARK	
0399	REF	8	LAST	255	07,2440	251550 0	INCR	MARKCNTR	OK FOR ANOTHER PAIR, INCR POINTER	
0400	REF	1			07,2441	4 7714 0		CS	PRID23	CLEAR BITS10,11,14 FOR NEXT PAIR
0401	REF	16	LAST	255	07,2442	7 1307 0		MASK	MARKSTAT	
0402	REF	17	LAST	255	07,2443	551307 0		TS	MARKSTAT	
0403	REF	12	LAST	255	07,2444	3 1551 1	VERIFYMK	CA	XYMARK	
0404	REF	18	LAST	255	07,2445	7 1307 0		MASK	MARKSTAT	
0405	REF	59	LAST	255	07,2446	10 000 0		CCS	A	
0406					07,2447	1 2451 1		TCF	+2	THIS MARK NOT DESIRED
0407	REF	1			07,2451	1 2526 0		TCF	VACSTCR	MARK DESIRED - STORE CCUS
0408	REF	14	LAST	255	07,2451	0 5567 0		TC	ALARM	
0409					07,2452	00114 0		CCT	114	
0410	REF	11	LAST	255	07,2453	0 5270 1		TC	RESUME	RESUME-DISPLAY UNCHANGED-WAIT FOR ACTION

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0411	REF	15	LAST	255	07,2454	0 5567 0	5WKALARM TC	ALARM	ATTEMPTING TO MAKE MORE THAN 5 WK PAIRS
0412					07,2455	00107 1	CCT	107	
04121	REF	2	LAST	255	07,2456	0 2514 0	TC	MARKTYPE	SEE IF SURFACE MARK
04122	REF	1			07,2457	1 2627 1	TCF	DSPV6N79	IT IS
0413	REF	12	LAST	255	07,2461	1 5270 1	TC	RESUME	DONT CHANGE DISPLAY-DC NOTHING

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0414	REF	3	LAST	256	07,2461	0 2514 0	MRREJ	TC	MARKTYPE	SEE IF SURFACE
04141	REF	1			07,2462	1 2507 0		TCF	SLRFFRJ	SURFACE-JUST CHECK MARK COUNTER
04142	REF	3	LAST	252	07,2463	3 5015 0		CAF	PRIO3	INFLIGHT-SEE IF MARKS MADE
0415	REF	15	LAST	255	07,2464	7 1307 0		MASK	MARKSTAT	
0416	REF	60	LAST	255	07,2465	10 000 0		CCS	A	
0417	REF	1			07,2466	1 2472 0		TCF	REJECT	MARKS MADE-REJECT CAN
0418	REF	16	LAST	256	07,2467	0 5567 0	REJALM	TC	ALARM	NO MARK TO REJECT-BAD PROCEDURE-ALARM
0419					07,2470	0 2115 1		CCT	115	
0420	REF	13	LAST	256	07,2471	0 5270 1		TC	RESUME	DESIRED ACTION DISPLAYED
0421	REF	5	LAST	228	07,2472	4 4355 1	REJECT	CS	PRIC31	ZERO BIT14, SHOW REJ., SEE IF MARK SINCE
0422	REF	20	LAST	257	07,2473	7 1307 0		MASK	MARKSTAT	LAST REJECT
0423	REF	10	LAST	220	07,2474	6 4737 0		AF	BIT13	
0424	REF	21	LAST	257	07,2475	57 1307 1		XCH	MARKSTAT	
0425	REF	20	LAST	257	07,2476	7 4737 1		MASK	BIT12	
0426	REF	61	LAST	257	07,2477	10 100 0		CCS	A	
0427	REF	1			07,2500	1 2505 1		TCF	REJECT12	ANOTHER REJECT SET BIT 10+11 TO ZERO
0428	REF	13	LAST	255	07,2501	4 1551 0		CS	XYMARK	MARK MADE SINCE REJECT-REJECT MARK IN 10
0429	REF	22	LAST	257	07,2502	7 1307 0	RENEWMK	MASK	MARKSTAT	
0430	REF	23	LAST	257	07,2503	55 1307 0		TS	MARKSTAT	
0431	REF	1			07,2504	1 2577 1		TCF	REMARK	GO REQUEST NEW MARK ACTION
0432	REF	4	LAST	257	07,2505	4 5015 1	REJECT12	CS	PRIO3	CAN SECOND REJECT-DISPLAY VB53 AGAIN
0433	REF	1			07,2506	1 2502 0		TCF	RENEWMK	
04331	REF	9	LAST	255	07,2507	11 550 1	SLRFFRJ	CCS	MARKCNTR	IF MARK DECREMENT COUNTER
04332					07,2510	1 2512 1		TCF	+2	
04333	REF	1			07,2511	1 2467 1		TCF	REJALM	NO MARKS TO REJECT-ALARM
04334	REF	10	LAST	257	07,2512	55 550 1		TS	MARKCNTR	
04335	REF	14	LAST	257	07,2513	0 5270 1		TC	RESUME	

L ACTMARK

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R0434

R0435 MARKTYPE TESTS TO SEE IF LCM ON LUNAR SURFACE. IF IT IS RETURN TO LCC+1

0436	REF	1		07,2514	4 0104 0	MARKTYPE	CS	FLAGWED8	SURFFLAG*****TEMPORARY*****
0437	REF	19	LAST	233	07,2515	7 4744 0	MASK	BIT8	
0438	REF	62	LAST	257	07,2516	10 000 0	CCS	A	
0439	REF	21	LAST	254	07,2517	24 002 0	INCR	Q	IF SURFACE MARK RETURN TO LOC +1
0440	REF	22	LAST	258	07,2520	0 0002 0	TC	Q	IF INFLIGHT MARK RETURN TO LCC +2
04401	REF	24	LAST	255	07,2521	3 4755 1	SURFSTCR	CAF	ZERO
04402	REF	15	LAST	255	07,2522	54 070 1	TS	RLPTREG1	FOR SURFACE MARK ZERO MARK KIND INDEX
04403	REF	24	LAST	257	07,2523	4 1307 0	CS	MARKSTAT	SET BITS10,11 TO SHOW SURFACE MARK
04404	REF	5	LAST	257	07,2524	7 5015 1	MASK	PRIC3	FOR MARKCHX
04405	REF	25	LAST	258	07,2525	27 1307 0	ADS	MARKSTAT	
0441	REF	4	LAST	252	07,2526	3 5004 0	VACSTCR	CAF	LCW9
0442	REF	26	LAST	258	07,2527	7 1307 0	MASK	MARKSTAT	STORE MARK VAC ACK IN RLPTREG2
0443	REF	6	LAST	172	07,2530	54 071 0	TS	RLPTREG2	
0444					07,2531	0 0006 1	EXTEND		
0445	REF	5	LAST	254	07,2532	3 0062 0	DCA	ITEMP1	PICK UP MARKTIME
0446	REF	1			07,2533	53 1562 0	FXCH	TSIGHT	STORE LAST MARK TIME
0447	REF	11	LAST	257	07,2534	3 1550 0	CA	MARKCNTR	6 X MARKCNTR FOR STORE INDEX
0448					07,2535	0 0006 1	EXTEND		
0449	REF	4	LAST	252	07,2536	7 6245 0	MP	SIX	
0450	REF	19	LAST	252	07,2537	56 001 0	FXCH	L	GET INDEX FROM LCW ORDER PART
0451	REF	7	LAST	258	07,2540	6 0071 1	AD	RLPTREG2	SET CCL STORE INDEX TO MARKVAC
04511	REF	16	LAST	258	07,2541	26 070 1	ACS	RLPTREG1	INCREMENT VAC PICKUP BY MARK FOR FLIGHT
0452	REF	5	LAST	253	07,2542	55 1552 0	TS	MKDEX	STORE HERE IN CASE OF SURFACE MARK
0453	REF	6	LAST	254	07,2543	3 0063 1	CA	ITEMP3	
0454	REF	17	LAST	258	07,2544	50 070 0	INDEX	RLPTREG1	
0455					07,2545	54 000 0	TS	0	STORE CCLY
0456	REF	4	LAST	254	07,2546	3 0064 0	CA	ITEMP4	
0457	REF	18	LAST	258	07,2547	50 070 0	INDEX	RLPTREG1	
0458					07,2550	54 002 1	TS	2	STORE CCLZ
0459	REF	3	LAST	254	07,2551	3 0065 1	CA	ITEMP5	
0460	REF	19	LAST	258	07,2552	50 070 0	INDEX	RLPTREG1	
0461					07,2553	54 004 1	TS	4	STORE CCLX
04611	REF	4	LAST	257	07,2554	0 2514 0	TC	MARKTYPE	IF SURFACE MARK-JUST DO SURFJOB
04612	REF	1			07,2555	1 2604 0	TCF	SURFJOB	
0462	REF	21	LAST	257	07,2556	3 4737 0	CAF	BIT13	CLEAR BIT13 TO SHOW MARK MADE
0463	REF	14	LAST	257	07,2557	6 1551 1	AD	XYMARK	SET MARK TO IN MARKSTAT
0464					07,2560	4 0000 0	CCM		
0465	REF	27	LAST	258	07,2561	7 1207 0	MASK	MARKSTAT	
0466	REF	15	LAST	258	07,2562	6 1551 1	AD	XYMARK	
0467	REF	28	LAST	258	07,2563	55 1307 0	TS	MARKSTAT	
0468	REF	6	LAST	258	07,2564	7 5015 1	MASK	PRIC3	SEE IF X, Y MARK MADE
0469	REF	20	LAST	258	07,2565	54 001 1	TS	L	

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0470	REF	7	LAST	258	07,2566	2 5015 0	CA	PRIC3	
0471					07,2567	0 0006 1	EXTEND		
0472	REF	9	LAST	252	07,2570	06 001 0	RXCER	LCHAN	
0473	REF	63	LAST	258	07,2571	10 00 0	CCS	A	
0474	REF	2	LAST	257	07,2572	1 2577 1	TCF	REMARK	NOT PAIR YET, DISPLAY MARK ACTION
0475	REF	25	LAST	258	07,2573	4 1307 0	CS	MARKSTAT	MARK PAIR COMPLETE-SET BIT14
0476	REF	26	LAST	255	07,2574	7 4736 0	MASK	BIT14	
0477	REF	31	LAST	259	07,2575	27 1307 0	ACS	MARKSTAT	
0478	REF	3	LAST	259	07,2576	1 2577 1	TCF	REMARK	GC DISPLAY V54

L AGTMARK

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0481	REF	8	LAST	255	07,2577	3 5015 0	REMARK	CAF	PRIC3	BITS 10 AND 11
0482	REF	31	LAST	255	07,2600	7 1307 0		MASK	MARKSTAT	
0483					07,2601	0 0006 1		EXTEND		
0484	REF	29	LAST	228	07,2602	7 4746 1		MP	BIT6	SHIFT MARK IDS TC BF 0 TO 3 FOR INDEX
0485	REF	6	LAST	258	07,2603	55 552 0		TS	MKDFX	STORE VERB INDEX
0486	REF	3	LAST	244	07,2604	3 5025 0	SURFJCB	CAF	PFID15	
0487	REF	3	LAST	193	07,2605	0 5072 1		TC	NEVAC	ENTER JCB TO CHANGE DISPLAY TO
0488	REF	16	LAST	258	07,1551			EBANK=	XYMARK	REQUEST NEXT ACTION
0489	REF	1			07,2606	02611 0		2CADR	CHANGEVB	
0489	REF	1			07,2607	16067 1				

0490	REF	15	LAST	257	07,2610	0 5270 1		TC	RESUME	
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0491	REF	5	LAST	258	07,2611	0 2514 0	CHANGEVB	TC	MARKTYPE	
0492	REF	2	LAST	256	07,2612	1 2627 1		TCF	DSPV6N79	SURFACE-DISPLAY V C6 N 79
0493	REF	7	LAST	260	07,2613	51 552 1		INDEX	MKDEX	INFLIGHT-PICK UP MARK VB INDEX
0494	REF	1			07,2614	3 2616 1		CAF	MKVB54	
04941	REF	1			07,2615	0 2211 1		TC	PASTIT	PASTE UP NEXT MK VERB DISPLAY

R0496 THE FOUR MKVBS ARE INDEXED-THEIR ORDER CANNOT BE CHANGED

0497					07,2616	15507 1	MKVB54	VN	5471	MAKE X CR Y MARK
0498					07,2617	15307 1	MKVB53	VN	5371	MAKE Y MARK
0499					07,2620	15107 0	MKVB52	VN	5271	MAKE X MARK
0500					07,2621	15507 1	MKVB54*	VN	5471	MAKE X CR Y MARK
0501					07,2622	04000 0	DP1/8	2DFC	.125	
0501					07,2623	00000 1				
0502					07,2624	00034 0	CCT34	CCT	34	
0503					07,2625	01507 1	V06N71	VN	671	
05031					07,2626	01517 0	V06N75*	VN	675	

L ADT MARK

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0504	POLTIME TO REQUEST CURSOR AND SPIRAL MEASUREMENTS									
0505	REF	1								COUNT* 44/R59
0506	REF	1			07,2627	3 2626 1	DSPV6N79	CAF	VO6N79*	CURSOR-SPIRAL DISPLAY
0507	REF	12	LAST	252	07,2630	0 4616 1		TC	BANKCALL	
0508	REF	4	LAST	246	07,2631	20334 1		CADR	GENAPKF	
0509	REF	4	LAST	252	07,2632	1 2060 1		TCF	KILLACT	V34-DCFS GETCPOOH
0510	REF	1			07,2633	1 2641 1		TCF	SURFEND	V22-PROCEED, END MARKING
0511	REF	32	LAST	260	07,2634	3 4746 0		CAF	BIT6	IF V32(CCT47) IN MPAC CC RECYCLE
05111	REF	32	LAST	229	07,2635	7 2154 0		MASK	MPAC	OTHERWISE IT IS LOAD VE ENTER SC
05112	REF	64	LAST	259	07,2636	10 000 0		CCS	A	RE-DISPLAY VO6N79
05113	REF	1			07,2637	1 2645 1		TCF	SURFAGAN	VR32-RECYCLE
05114	REF	3	LAST	260	07,2640	1 2627 1		TCF	DSPV6N79	ENTER
0512	REF	27	LAST	259	07,2641	4 4736 0	SURFEND	CS	BIT14	SET BIT14 TO SHOW MARK END
0513	REF	32	LAST	260	07,2642	7 1307 0		MASK	MARKSTAT	
05131	REF	28	LAST	261	07,2643	6 4736 1		AC	BIT14	
0514	REF	32	LAST	261	07,2644	55 307 0		TS	MARKSTAT	
0515	REF	1			07,2645	3 1235 1	SURFAGAN	CA	CURSOR	
0516	REF	8	LAST	260	07,2646	51 552 1		INDEX	MKDEX	HOLDS VAC AREA POINTER FOR SURF MARKING
0517					07,2647	54 201 1		TS	1	STORE CURSOR SP 20CMP
0518	REF	1			07,2650	3 1237 0		CA	SPIRAL	
0519	REF	9	LAST	261	07,2651	51 552 1		INDEX	MKDEX	
0520					07,2652	54 003 0		TS	3	STORE SPIRAL
0521	REF	34	LAST	261	07,2653	4 1307 0		CS	MARKSTAT	IF BIT 14 SET-END MARKING
0522	REF	29	LAST	261	07,2654	7 4736 0		MASK	BIT14	
0523					07,2655	0 0006 1		EXTEND		
0524	REF	2	LAST	252	07,2656	1 2216 1		BZF	MARKCHFX	
0525	REF	12	LAST	258	07,2657	3 1550 0		CA	MARKCNTR	THIS IS RECYCLE-SEE IF 5 MARKS ALREADY
0526	REF	11	LAST	255	07,2659	5 4753 1		AD	ONE	
0527					07,2661	4 0000 0		CCM		
0528	REF	6	LAST	253	07,2662	6 4755 1		AD	FIVE	
0529					07,2663	0 0106 1		EXTEND		
0530	REF	2	LAST	255	07,2664	6 2454 0		BZMF	5 MARKS ALARM	CANT RECYCLE-TO MANY MARKS-ALARM
0531	REF	13	LAST	261	07,2665	25 550 0		INCR	MARKCNTR	CF FOR RECYCLE-INCR COUNTER
0532	REF	3	LAST	252	07,2666	1 2215 0		TCF	GETMKS +3	CC DISPLAY MARK VB

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0001					07,2667				BANK 7		
0002	REF	1			43,2000				SETLCC EXTVERBS		
0003					43,2000				BANK		
0004	REF	2	LAST	197	55,1737				EBANK= CGC		
0005	REF	1							COUNT* \$\$/EXTVB		
0006	FAN-CLT										
0007	REF	32	LAST	261	43,2000	50 154 1	GCFXTVB	INDEX	MPAC	VERB-40 IS IN MPAC	
0008	REF	1			43,2001	0 2002 1		TC	LST2FAN	FAN AS BEFORE.	
0009	REF	1			43,2002	0 2124 1	LST2FAN	TC	VEZERC	VB40 ZERC (USED WITH NCUN 20 OR 72 ONLY)	
0010	REF	1			43,2003	0 2172 1		TC	VB00ARK	VB41 CCARSE ALIGN (USED WITH NCUN 20 OR 72 ONLY)	
0011											
0012	REF	1			43,2004	0 2263 0		TC	IMUFINEK	VB42 FINE ALIGN IMU	
0013	REF	1			43,2005	0 2727 1		TC	IMGATTCK	VB43 LCAD IMU ATTITUDE ERROR METERS.	
0014	REF	1			43,2006	0 2277 1		TC	RRDESENC	VB44 TERMINATE CONTINUOUS DESIGNATE	
0015	REF	1			43,2007	0 2114 1		TC	ALM/END	VB45 SPARE	
0016	REF	2	LAST	262	43,2008	0 2114 1		TC	ALM/END	VB46 SPARE	
0017	REF	1			43,2011	0 2422 1		TC	V47TXACT	VB47 ACS INITIALIZATION	
0018	REF	1			43,2012	0 3152 1		TC	DAPDISP	VB48 LCAD A/P DATA	
0019	REF	1			43,2013	1 3032 1		TCF	CREWMANU	VB49 START AUTOMATIC ATTITUDE MANEUVER	
0020	REF	1			43,2014	0 2414 1		TC	GCLOADLV	VB50 PLEASE PERFORM	
0021	REF	3	LAST	262	43,2015	0 2114 1		TC	ALM/END	VB51 SPARE	
0022	REF	2	LAST	262	43,2016	0 2414 1		TC	GCLOADLV	VB52 PLEASE MARK X - RETICLE.	
0023	REF	3	LAST	262	43,2017	0 2414 1		TC	GCLOADLV	VB53 PLEASE MARK Y - RETICLE.	
0024	REF	4	LAST	262	43,2020	0 2414 1		TC	GCLOADLV	VB54 PLEASE MARK X OR Y - RETICLE	
0025	REF	1			43,2021	0 2434 0		TC	ALINTIME	VB55 ALIGN TIME	
0026	REF	1			43,2022	0 3041 1		TC	TRMTRACK	VB56 TERMINATE TRACKING - P20 + P25	
0027	REF	1			43,2023	0 2317 0		TC	LRON	VB57 PERMIT LANDING RADAR UPDATES	
0028	REF	1			43,2024	0 2360 0		TC	LRPFF	VB58 INITIATE LANDING RADAR UPDATES	
0029	REF	1			43,2025	0 2145 0		TC	LRPDS2K	VB59 COMMAND LR TO POSITION 2.	
0030	REF	1			43,2026	0 2167 0		TC	RATEDISP	VB60 DISPLAY CAP ESTIMATED RATES	
0031	REF	1			43,2027	0 2157 0		TC	DAPATTER	VB61 DISPLAY CAP ATTITUDE ERROR	
0032	REF	1			43,2030	0 2162 0		TC	TCTATTER	VB62 DISPLAY TCIAL ATTITUDE ERROR	
0033	REF	1			43,2031	0 2447 1		TC	R04	VB63 SAMPLE RADAR ONCE PER SECOND	
0034	REF	1			43,2032	0 2721 1		TC	VB64	VB64 CALCULATE, DISPLAY S-BAND ANT ANGLES	
0035	REF	1			43,2033	0 3242 0		TC	SNUFFOUT	VB65 DISABLE L,V JETS DURING DPS BURNS.	
0036	REF	1			43,2034	0 3157 1		TC	ATTACHED	VB66 ATTACHED MOVE THIS TO OTHER STATE	
0037	REF	1			43,2035	0 3234 1		TC	V67	VB67 W MATRIX MONITOR	
0038	REF	4	LAST	262	43,2036	0 2114 1		TC	ALM/END	VB68 SPARE	
0039	REF	1			43,2037	0 2037 1	VERB69	TC	VERB69	VB69 FORCE A HARDWARE RESTART	
0040	REF	1			43,2040	0 3745 1		TC	V70UPDAT	VB70 UPDATE LIFTOFF TIME.	
0041	REF	1			43,2041	0 3747 0		TC	V71UPDAT	VB71 UNIVERSAL UPDATE - BLOCK ADDRESS.	
0042	REF	1			43,2042	0 3751 1		TC	V72UPDAT	VB72 UNIVERSAL UPDATE - SINGLE ADDRESS.	
0043	REF	1			43,2043	0 3753 0		TC	V73UPDAT	VB73 UPDATE AGC TIME (CCTAL).	
0044	REF	1			43,2044	0 3062 0		TC	ENEDUMP	VB74 INITIALIZE DOWN-TELEMETRY PROGRAM	
0045										FOR ERASABLE DUMP.	
0046	REF	1			43,2045	0 3245 1		TC	OLTSNUFF	VB75 ENABLE L,V JETS DURING DPS BURNS.	

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0047	REF	1		43,2046	0 3121 1	TC	MINIMP	VB76 MINIMUM IMPULSE WCCF
0048	REF	1		43,2147	0 3124 1	TC	NOMINIMP	VB77 RATE COMMAND WCODE
0049	REF	1		43,2050	0 2437 0	TC	R77	VB78 START LR SPURIOUS RETURN TEST
0051	REF	1		43,2151	0 2651 1	TC	R77END	VB79 TERMINATE LR SPURIOUS RETURN TEST
0051	REF	1		43,2152	0 3066 1	TC	LEMVEC	VB80 UPDATE LEM STATE VECTOR
0052	REF	1		43,2153	0 3071 1	TC	CSMVEC	VB81 UPDATE CSM STATE VECTOR
0053	REF	1		43,2154	0 2766 1	TC	VB2PERF	VB82 REQUEST CRPTT PARAM DISPLAY (R30)
0054	REF	1		43,2155	0 2776 0	TC	VB3PERF	VB83 REQUEST REND PARAM DISPLAY (R31)
0055	REF	5	LAST 262	43,2156	0 2114 1	TC	ALM/END	VB84 SPARE
0056	REF	1		43,2157	0 3250 0	TC	VERB85	VB85 DISPLAY RR LCS AZ AND ELEV
0057	REF	6	LAST 263	43,2160	0 2114 1	TC	ALM/END	VB86 SPARE
0058	REF	7	LAST 263	43,2161	0 2114 1	TC	ALM/END	VB87 SPARE
0059	REF	8	LAST 263	43,2162	0 2114 1	TC	ALM/END	VB88 SPARE
0061	REF	1		43,2163	0 3004 0	TC	VB9PERF	VB89 ALIGN XPRZ LEM AXIS ALONG LOS (R63)
0061	REF	1		43,2164	0 3113 0	TC	VS9PERF	VB90 CLT OF PLANE RENDZVCUS DISPLAY
0062	REF	1		43,2165	0 3115 1	TC	GCSHCUSUM	VB91 DISPLAY BANK SUM.
0063	REF	1		43,2166	0 3111 1	TC	SYSTEST	VB92 OPERATE IMU PERFORMANCE TEST.
0064	REF	1		43,2167	0 3111 1	TC	WMATRNG	VB93 CLEAR RENDWFLG
0065	REF	9	LAST 263	43,2171	0 2114 1	TC	ALM/END	VB94 SPARE
0066	REF	1		43,2171	0 3076 0	TC	UPDATCFF	VB95 AC STATE VECTOR UPDATE ALLOWED
0067	REF	1		43,2172	0 3227 0	TC	VERB96	VB96 INTERRUPT INTEGRATION AND GO TO RCC
0068	REF	5	LAST 262	43,2173	0 2414 1	TC	GCLCAPLV	VB97 PLEASE VERIFY ENGINE FAILURE
0069	REF	11	LAST 263	43,2174	0 2114 1	TC	ALM/END	VB98 SPARE
0070	REF	6	LAST 263	43,2175	0 2414 1	TC	GCLCAPLV	VB99 PLEASE ENABLE ENGINE

R0071 END OF EXTENDED VERB FILE

0072	REF	5	LAST 246	43,2176	111143 0	TESTXACT CCS	EXTVBACT	ARE EXTENDED VERBS BUSY
0073	REF	11	LAST 263	43,2077	0 2114 1	TC	ALM/END	YES, TURN ON OPERATOR LIGHT
0074	REF	2	LAST 223	43,2110	3 0100 0	CA	FLAGWRD4	ARE PRIORITY DISPLAYS USING DSKY
0075	REF	1		43,2111	7 2123 1	MASK	CC24100	
00751	REF	65	LAST 261	43,2112	10 0000 0	CCS	A	
00752	REF	12	LAST 263	43,2113	0 2114 1	TC	ALM/END	YES
0076	REF	1		43,2114	3 4362 1	CAF	OCT25	SET BITS 1, 3, AND 5
0077	REF	6	LAST 263	43,2115	551143 0	SETXTACT TS	EXTVBACT	NO. SET FLAG TO SHOW EXT VERB DISPLAY
ACC78								SYSTEM BUSY
0079	REF	23	LAST 258	43,2116	3 0002 0	CA	G	
0080	REF	34	LAST 262	43,2117	54 155 1	TS	MPAC +1	
0081	REF	4	LAST 244	43,2111	4 4752 1	CS	TWO	BLANK EVERYTHING EXCEPT AM AND VERB
0082	REF	1		43,2111	0 4154 0	TC	NVSUB	
0083				43,2112	0 2113 0	TC	+1	
0084	REF	35	LAST 262	43,2113	0 1155 0	TC	MPAC +1	
0087	REF	6	LAST 209	5472		TERMEXTV	EQUALS ENDEXT	
0088	REF	7	LAST 263	5472		ENDEXTVB	EQUALS ENDEXT	
0091	REF	2	LAST 233	43,2114	0 4364 1	ALM/END TC	FALTCN	TURN ON OPERATOR ERROR LIGHT

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0092	REF	7	LAST	255	43,2115	0 4635 0	GCPIN	TC	POSTJUMP
0093	REF	2	LAST	228	43,2116	21051 0		CADR	PINBRCH
0094	REF	6	LAST	232	43,2117	3 1010 1	CHKPOOH	CA	MCDREG
0095					43,2120	0 0006 1		EXTEND	
0096	REF	1			43,2121	1 6745 0		BZF	TCG
0097	REF	13	LAST	263	43,2122	0 2114 1		TC	ALM/END
00971					43,2123	24100 0	CC241C0	CCT	24100

CHECK FOR PCO OR POC-.

L EXTENDED VERRS

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P0008	VRZERC	VERB 4	DESCRIPTION
P0009			
P0100			1. REQUIRE NCUN 20 (ICCU ANGLES) OR NCUN 72 (RCOU ANGLES).
P0101			2. FOR N21, CHECK IMUCADR IN AN EFFCRT TO AVOID A 121C RESTART.
P0102			FOR N72, CHECK IF EITHER RADAR IS IN USE.
P0103			3. EXECUTE THE CCL ZERC.
P0104			4. STALL UNTILL THE ZERO IS DONE.
P0105			5. DON'T DIFFERENTIATE BETWEEN A BAT CP CCDC RETURN.
P0106			6. EXIT, RE-ESTABLISHING THE INTERRUPTED DISPLAY (IF ANY).

0110	REF	1		43,2124	0 2175 0	VRZERC	TC	CP/INERT	
0111	REF	1		43,2125	0 2127 1		TC	IMUZERCK	RETURN HERE IF NCUN = ICCU(20)
0112	REF	1		43,2126	0 2136 1		TC	RRZERCK	RETURN HERE IF NCUN = RCDU(72)
0113	REF	1		43,2127	0 2430 1	IMUZERCK	TC	CKMOCCAD	
01131	REF	13	LAST	261	43,2130	0 4616 1	TC	BANKCALL	KEYBOARD REQ FOR ISS CCLZERO
0114	REF	2	LAST	209	43,2131	16706 1	CADR	IMUZERC	
0115	REF	14	LAST	265	43,2132	0 4616 1	TC	BANKCALL	STALL
0116	REF	2	LAST	209	43,2133	17710 1	CADR	IMUSTALL	
0117					43,2134	0 2125 1	TC	+1	
0118	REF	1			43,2135	0 2115 0	TC	GCPIN	IMUZERO
0120	REF	1			43,2136	0 2674 0	RRZERCK	TC	RCDLSECK
01202	REF	15	LAST	265	43,2137	0 4616 1	TC	BANKCALL	
0121	REF	1			43,2140	52354 1	CADR	PRZERC	
0122	REF	16	LAST	265	43,2141	0 4616 1	RWAITK	TC	BANKCALL
0123	REF	1			43,2142	17706 0	CADR	RADSTALL	
0124					43,2143	1 2144 0	TCF	+1	
0125	REF	2	LAST	265	43,2144	0 2115 0	TC	GCPIN	RRZERC

R0126	LRPOS2K	VERB 59	DESCRIPTION
R0127			COMMAND LANDING RADAR TO POSITION 2
R0128			1. EXIT WITH CP EFFCRT IF SOMEONE IS USING EITHER RADAR.
R0130			2. ALARM WITH CODE 523 IF POS 2 IS ACT INDICATED WITHIN
R0131			THE PRESCRIBED TIME.
R01311			3. RE-ESTABLISH THE DISPLAYS.

0132	REF	2	LAST	265	43,2145	0 2674 0	LRPOS2K	TC	REPUSECK	
01322	REF	17	LAST	265	43,2146	0 4616 1		TC	BANKCALL	COMMAND LR TO POSITION 2
0133	REF	1			43,2147	53454 1	CADR	LRPOS2		
0134	REF	18	LAST	265	43,2150	0 4616 1	TC	BANKCALL		
01341	REF	2	LAST	265	43,2151	17706 0	CADR	RADSTALL		
01342	REF	1			43,2152	0 2154 0	TC	LFP2ALM		
01343	REF	3	LAST	265	43,2153	0 2115 0	TC	GCPIN		
01345	REF	17	LAST	267	43,2154	0 5557 0	LFP2ALM	TC	ALARM	
01346					43,2155	00523 0	CCT	523		
01347	REF	4	LAST	265	43,2156	0 2115 0	TC	GCPIN		

L EXTENDED VEPBS

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R0135 V61 VERB 61, DISPLAY DAP ATTITUDE ERRORS ON FDAI ATTITUDE ERROR NEEDLES.

0137	REF	12	LAST	232	43,2157	0 5516 0	CAPATTER TC	DOWNFLAG
0138	REF	1			43,2160	00013 0	ADRES	NEEDLFLG
0139	REF	2	LAST	262	43,2161	1 2164 1	TCF	TCTATTER +2

R0140 V62 VERB 62, DISPLAY TOTAL ATTITUDE ERRORS ON FDAI ATTITUDE ERROR NEEDLES.

0142	REF	1			43,2162	0 5504 0	TCTATTER TC	UPFLAG
0143	REF	2	LAST	266	43,2163	00013 0	ADRES	NEEDLFLG
01431	REF	13	LAST	266	43,2164	0 5516 0	+2 TC	DOWNFLAG
01432	REF	1			43,2165	00000 1	ADRES	NEED2FLG
0144	REF	5	LAST	265	43,2166	0 2115 0	TC	GCPIN

R01441 V60 VERB 60, DISPLAY DAP ESTIMATED RATES ON FDAI ATTITUDE ERROR NEEDLES.

01443	REF	2	LAST	266	43,2167	0 5504 0	RATEDISP TC	UPFLAG
01444	REF	2	LAST	266	43,2170	00000 1	ADRES	NEED2FLG
01445	REF	6	LAST	266	43,2171	0 2115 0	TC	GCPIN

R0145

L EXTENDED VERBS

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PO146	VBOCARK	VERB 41	DESCRIPTION
PO147			COARSE ALIGN IMU OR PADAP
PO148			1. REQUIRE NCUN 20 OR NCUN 72 OR TCUA ON OPERATOR ERROR.
PO149			2. REQUIRE EXT VERB DISPLAY SYS AVAILABLE OR TURN ON OPERATOR ERROR LIGHT AND GO TO FINEPACH.
PO151			CASE 1 NCUN 20 (ICCU ANGLES)
PO152			3. SET EXT VERB DISPLAY ACTIVE FLAG.
PO153			4. DISPLAY FLASHING V25,N22 (LOAD NEW ICCU ANGLES).
PO154			RESPONSES
PO155			A. TERMINATE
PO156			1. RELEASE EXT VERB DISPLAY SYSTEM
PO157			B. PROCEED
PO158			1. COARSE ALIGN TO THE EXISTING THEAD'S (ICORK2).
PO168			C. ENTER
PO169			1. COARSE ALIGN TO THE LOADED THEAD'S (ICORK2).
PO170			ICORK2
PO171			1. RE-DISPLAY VERB 41.
PO172			2. EXECUTE IMUCOARS (IMU COARSE ALIGN).
PO173			3. EXECUTE IMUSTALL (ALLOW TIME FOR DATA TRANSFER).
PO174			4. RELEASE EXT VERB DISPLAY SYSTEM.
PO175			CASE 2 NCUN 72 (PCDU ANGLES)
PO175E			EXIT WITH CP ERROR IF SCMECAC IS USING EITHER PADAP.
PO176			5. DISPLAY FLASHING V24,N73 (LOAD NEW PR TEUNION ANGLE AND NEW SHAFT ANGLE).
PO178			RESPONSES
PO179			A. TERMINATE
PO180			1. RELEASE EXT VERB DISPLAY SYS.
PO181			P. PROCEED OR ENTER
PO182			1. EXECUTE AURLOCKN (ASK OPERATOR FOR LOCK-ON REQUIREMENTS).
PO184			2. RE-DISPLAY VERB 41.
PO185			3. SCHEDULE PDCSK2 WITH PRIORITY 20.
PO186			4. RELEASE EXT VERB DISPLAY SYS.
PO187			AURLOCKN
PO188			1. FLASH V04 N12 R1 = 00006 R2 = 00002
PO189			RESPONSES
PO190			A. TERMINATE
PO194			B. PROCEED
PO195			1. RESET LOCK-ON SWITCH
PO1951			2. SET CCATINCLCS DESIGNATE FLAG
PO1952			3. DISABLE R25
PO196			C. V22 = 1 E, R1 = 00001, PROCEED
PO197			1. SET LOCK-ON SWITCH
0198	REF	2	LAST 265 43,2172 0 2175 0 VBOCARK TC CP/INERT
0199	REF	1	43,2173 0 2206 1 TC IMUCCARK RETURN HERE IF NCUN = ICCU(20)
0200	REF	1	43,2174 0 2230 1 TC PROFSABK RETURN HERE IF NCUN = RCCU(72)
RO201			RETURN TO L+1 IF IMU OR L+2 IF PR.
0202	REF	2	LAST 232 43,2175 4 6007 1 CP/INERT CS OCT24
0203	REF	2	LAST 223 43,2176 6 1001 1 AD NCUNREG
0204			43,2177 0 0006 1 EXTEND

L EXTENDED VERBS

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0205	REF	2	LAST	264	43,2200	1 6745 0	BZF	YCC	IF = 20.
0207	REF	1			43,2201	6 2295 1	AD	RRIMUDIF	-52
0208					43,2202	0 0006 1	EXTEND		
0209	REF	2	LAST	158	43,2203	1 6742 1	BZF	Q+1	
0210	REF	14	LAST	264	43,2204	0 2114 1	TC	ALM/END	ILLEGAL.
0211					43,2205	77713 1	RRIMUDIF	DEC	THE IMU
0213	REF	2	LAST	265	43,2206	0 2430 1	INUCCARK	TC	CKMODCAD
0214	REF	1			43,2207	0 2076 1	TC	TESTXACT	COARSE ALIGN FROM KEYBOARD.
0215	REF	1			43,2210	3 2226 0	CAF	VNLODCDU	CALL FOR THETAC LOAD
0216	REF	19	LAST	265	43,2211	0 4616 1	TC	BANKCALL	
0217	REF	1			43,2212	20334 1	CADR	GCXDSFF	
0218	REF	1			43,2213	0 5472 0	TC	TERMEXTV	
0219					43,2214	1 2215 1	TCF	+1	
0220	REF	1			43,2215	3 2227 1	ICCRK2	CAF	INUCCARV
0221	REF	20	LAST	268	43,2216	0 4616 1	TC	BANKCALL	RE-DISPLAY COARSE ALIGN VERB.
0222	REF	2	LAST	208	43,2217	20621 0	CADR	EXCSFRET	
0223	REF	21	LAST	268	43,2220	0 4616 1	TC	BANKCALL	CALL MCCE SWITCHING PROC
0224	REF	1			43,2221	16772 1	CADR	INUCCARS	
0225	REF	22	LAST	268	43,2222	0 4616 1	TC	BANKCALL	STALL
0226	REF	3	LAST	265	43,2223	17710 1	CADR	INUSTALL	
0227	REF	1			43,2224	0 5472 0	TC	ENDEXTVB	
0228	REF	2	LAST	268	43,2225	0 5472 0	TC	ENDEXTVB	
0229					43,2226	06226 1	VNLODCDU	VN	2522
0230					43,2227	12270 0	INUCCARV	VN	4100

L EXTENDED VERBS

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P0231 DESIGNATE TO DESIRED GIMBAL ANGLES.

0232	REF	3	LAST	265	43,223	0 2674 1	RRDESNBK	TC	RDFUSECK	
0234	REF	2	LAST	268	43,2231	0 2076 1		TC	TESTXACT	
0239	REF	1			43,2232	4 2216 0		CS	CCT41000	TERMINATE PRESENT DESIGNATION
0241					43,2233	0 2214 0		INHINT		RELINT DONE IN GEXDSPF
0241	REF	18	LAST	221	43,2234	7 0110 0		MASK	PADMCEES	
0242	REF	19	LAST	265	43,2235	54 111 0		TS	PADMCEES	
0243	REF	1			43,2236	3 2255 1		CAF	VNLDRCDU	ASK FOR GIMBAL ANGLES.
0244	REF	23	LAST	268	43,2237	0 4616 1		TC	BANKCALL	
0245	REF	2	LAST	268	43,2247	20334 1		CADR	GEXDSPF	
0246	REF	2	LAST	268	43,2241	0 5472 0		TC	TERMEXTV	
0247					43,2242	1 2236 0		TCF	-4	V33
0248	REF	24	LAST	265	43,2243	0 4616 1		TC	BANKCALL	ASK OF FOR LOCK ON REQUIREMENTS.
0249	REF	1			43,2244	4600 0		CADR	AURLCKON	
0250	REF	1			43,2245	3 2227 1		CAF	CPTCCARV	RE-DISPLAY CUP OWN VREF
0251	REF	25	LAST	269	43,2246	0 4616 1		TC	BANKCALL	
0252	REF	3	LAST	268	43,2247	20621 0		CADR	EXDSFRET	
0253	REF	1			43,2250	3 4736 1		CAF	PRI020	
0254	REF	2	LAST	244	43,2251	0 5105 0		TC	FINDVAC	
0255	REF	6	LAST	240	07,1456			EBANK=	LOSCCUNT	
0256	REF	1			43,2252	02256 1		2CADR	RRDESK2	
0256	REF	1			43,2253	66107 1				
0257	REF	3	LAST	269	43,2254	1 5472 1		TCF	TERMEXTV	FPEES DISPLAY.
0258					43,2255	06111 0	VNLDRCDU	VN	2473	
0259	REF	2	LAST	268	43,2227		CPTCCARV	EGLALS	INLCCARV	DIFFERENT NOUNS.
0260	REF	26	LAST	269	43,2256	0 4616 1	RRDESK2	TC	BANKCALL	
0261	REF	1			43,2257	52506 0		CADR	RRDESNB	
0262					43,2260	0 2261 0		TC	+1	CUMY NEEDED SINCE DESRETPN CCFS INCR
02621	REF	9	LAST	222	43,2261	3 0167 1		CA	PRIORITY	
02622	REF	5	LAST	258	43,2262	7 5104 1		MASK	LCW9	
02623	REF	66	LAST	263	43,2263	10 000 0		CCS	A	
02624	REF	67	LAST	269	43,2264	50 000 1		INDEX	A	
02625	REF	68	LAST	265	43,2265	54 000 0		TS	A	RELEASE THIS JOBS VAC AREA.
02626					43,2266	4 000 0		COM		INSURE ENDOFJOB CCFS A ACVAC FNC (E7MF).
02627	REF	11	LAST	265	43,2267	26 167 0		ADS	PRIORITY	
0263	REF	27	LAST	269	43,2270	0 4616 1		TC	BANKCALL	WAIT FOR COMPLETION OF DESIGNATE
0264	REF	3	LAST	265	43,2271	17716 0		CADR	FASTALL	
0265					43,2272	0 2274 1		TC	+2	EACEND-NO LOCKEN OR OUT OF LIMITS
0266	REF	4	LAST	239	43,2273	0 5155 0		TC	ENDOFJOB	GCCEND-LOCKEN ACHIEVED
0267	REF	18	LAST	265	43,2274	0 5567 0		TC	ALARM	
0268					43,2275	00503 1		CCT	503	TURN ON ALARM LIGHT -503 DESIGNATE FAIL

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0269	REF	5	LAST	269	43,2276	0 5155 0	TC	ENDCFJ0R	
0270	REF	20	LAST	269	43,2277	10 110 0	PRDESEND CCS	RADMCCES	TERMINATE CONTINUOUS DESIGNATE ONLY
0271	PFF	7	LAST	266	43,2300	1 2115 1	TCF	GCPIN	
0272	PFF	8	LAST	270	43,2301	1 2115 1	TCF	GCPIN	
0273					43,2302	1 2303 1	TCF	+1	
0274	REF	2	LAST	269	43,2303	4 2316 0	CS	OCT41000	BEGDFS CCES TO ENDRADAR
0275					43,2304	0 0004 0	INFINT		RELINT CCNE IN DOWNFLAG
0276	REF	21	LAST	270	43,2305	7 0110 0	MASK	RADMCCES	
0277	PFF	22	LAST	270	43,2306	54 110 0	TS	RADMCCES	
02771	PFF	3	LAST	232	43,2307	0 6011 1	TC	CLRADMCD	
02773	REF	1			43,2310	3 4777 1	CAF	1SEC	
02774	PFF	28	LAST	269	43,2311	0 4616 1	TC	BANKCALL	
02775	REF	3	LAST	209	43,2312	01736 1	CADR	DELAYJCB	
0278	PFF	14	LAST	266	43,2313	0 5516 0	TC	DOWNFLAG	ENABLE R25 GIMBAL MONITOR
0279	PFF	1			43,2314	00126 1	ADRES	NCRRMCA	
0280	REF	9	LAST	270	43,2315	1 2115 1	TCF	GCPIN	
0281					43,2316	41000 1	OCT41000 CCT	41000	CONTINUOUS DESIGNATE - DESIGNATE

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02812					23,2100			BANK	23		
02814	RFF	1			23,2100			SFTLCC	EXTVE1		
02816					23,2100			BANK			
02818	RFF	1						CCOUNT*	\$/EXTVE		
0282	RFF	1			23,2100	0 4645 1	AURLCKCN	TC	MAKFCADR		
0283	RFF	2	LAST	103	23,2101	551112 0		TS	DESRET		
0284	RFF	5	LAST	263	23,2102	3 4752 0		CAF	TWC		
0285	RFF	1			23,2102	551051 0		TS	CPTICAX +1		
0286	RFF	5	LAST	258	23,2104	3 6245 1		CAF	SIX		CPTION CCDF FOR VC4N12
02862	RFF	2	LAST	271	23,2105	551050 1		TS	CPTICAX		
02864	RFF	1			23,2106	3 2137 1	-5	CAF	VC4N1272		
02866	RFF	29	LAST	270	23,2107	0 4610 1		TC	BANKCALL	P2 00001	LCKC-CN
02868	RFF	1			23,2110	20353 0		CA	GMARKER		
02869	RFF	8	LAST	263	23,2111	1 5472 1		TCF	ENDEXT	V34	
0287					23,2112	1 2017 1		TCF	+5	V33	
0288					23,2113	1 2026 1		TCF	-5	V32	
0289	RFF	14	LAST	254	23,2114	3 4751 0		CAF	BIT3		
0290	RFF	1			23,2115	0 5464 1		TC	BLANKET		
0291	RFF	6	LAST	270	23,2116	0 5155 0		TC	ENDOF JOB		
0292	RFF	3	LAST	271	23,2117	3 1051 1	+5	CA	CPTICAX +1		
0293	RFF	21	LAST	244	23,2120	7 4752 1		MASK	BIT2		
0294	RFF	69	LAST	269	23,2121	10 000 0		CCS	A		
0295	RFF	1			23,2122	1 2026 0		TCF	NOLOCKCN		
0296	RFF	3	LAST	266	23,2123	0 5504 0		TC	UPFLAG		
0297	RFF	1			23,2124	00012 1		ADRES	LCKCN5W		
0298	RFF	1			23,2125	1 2034 0		TCF	AURLCKCN1		
0299	RFF	15	LAST	270	23,2126	0 5516 0	NOLOCKCN	TC	DOWNFLAG		IF NO LOCK-CN, SET BIT15 OF RALMCCES TO
02991	RFF	2	LAST	271	23,2127	00012 1		ADRES	LCKCN5W		INDICATE THAT CONTINUOUS DESIGNATION IS
02992	RFF	4	LAST	271	23,2130	0 5504 0		TC	UPFLAG		WANTED (TC BE TERMINATED BY V44.)
02993	RFF	1			23,2131	00264 1		ADRES	CODEFLAG		
0302	RFF	5	LAST	271	23,2132	0 5514 0		TC	UPFLAG		SET NO RP ANGLE MONITOR FLAG.
0303	RFF	2	LAST	270	23,2133	00126 1		ADRES	NCRRCMN		(DISABLE #25 RR GIMBAL MONITOR IN T4RUPT
0304					23,2134	0 0013 1	AURLCKCN1	RFLINT			
0305	RFF	3	LAST	271	23,2135	3 1112 1		CA	DESRET		
0306	RFF	1			23,2136	1 4640 0		TCF	BANKJLMP		
03064					23,2137	01014 0	VC4N1272	VA	412		
03065					23,2140	77757 1	-LOCKCNFG	CCT	-20		
03066					43,2317			BANK	43		
03067	RFF	2	LAST	262	43,2000			SFTLCC	EXTVEFB5		
03068					43,2317			BANK			
03069	RFF	2	LAST	262	TC 271:	207 207*		CCOUNT*	\$/EXTVE		
0307	RFF	3	LAST	265	43,2317	0 2076 1	LPCN	TC	TESTXACT		

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0308	REF	1		43,2320	3 2357 1	ESP68	CAF	VO6N68
0309	REF	30	LAST	271	43,2321	0 4616 1	TC	BANKCALL
0310	REF	2	LAST	271	43,2322	20353 1	CADR	GOMARKFR
0311	REF	1			43,2323	0 2355 0	TC	B1+5CFF
0312	REF	1			43,2324	0 2346 1	TC	SFT57
0313	REF	7	LAST	271	43,2325	0 5155 0	TC	ENDOFJOB
0314	REF	31	LAST	272	43,2326	0 4616 1	WAIT68	TC
0315	REF	1			43,2327	0 1735 1	CADR	2SFCDFLY
0316	REF	1			43,2330	3 4361 1	CAF	CCT21
0317	REF	7	LAST	263	43,2331	7 1043 0	MASK	EXTVBACT
0318					43,2332	0 3006 1	EXTEND	
0319	REF	9	LAST	271	43,2333	1 5472 1	RZF	ENDEXT
0320	REF	17	LAST	254	43,2334	7 4747 0	MASK	BIT5
0321	REF	70	LAST	271	43,2335	10 0000 0	CCS	A
0322	REF	1			43,2336	1 2320 0	TCF	DSP68
0323	REF	1			43,2337	3 2357 1	DSP5068	CAF
0324	REF	32	LAST	272	43,2340	0 4616 1	TC	BANKCALL
0325	REF	1			43,2341	20361 1	CADR	GOMARK3R -1
0326	REF	2	LAST	272	43,2342	1 2355 1	TCF	B1+5OFF
0327	REF	3	LAST	272	43,2343	1 2355 1	TCF	B1+5CFF
0328	REF	1			43,2344	1 2351 0	TCF	RESET57
0329	REF	1			43,2345	1 2326 0	TCF	WAIT68
0330	REF	6	LAST	271	43,2346	0 5504 0	SET57	TC
0331	REF	1			43,2347	0 0254 1	ADRES	LRINH
0332	REF	1			43,2350	1 5563 0	TCF	B5CFF
0333	REF	16	LAST	271	43,2351	0 5516 0	RESET57	TC
0334	REF	2	LAST	272	43,2352	0 0254 1	ADRES	LRINH
0335	REF	2	LAST	263	43,2353	3 4362 1	CAF	CCT25
0336	REF	2	LAST	272	43,2354	0 5565 1	TC	B5OFF +2
0337	REF	2	LAST	272	43,2355	4 4361 0	B1+5CFF	CS
0338	REF	3	LAST	272	43,2356	1 5564 1	TCF	B5CFF +1
0339	REF	1			4361		OCT21	EQUALS NO1
0340					43,2357	0 1504 1	VC6N68	VN
0341	REF	2	LAST	272	43,2357		VC6N68	=
0342	REF	17	LAST	272	43,2360	0 5516 0	LR0FF	TC
0343	REF	3	LAST	272	43,2361	0 0254 1	ADRES	LRINH
0344	REF	10	LAST	270	43,2362	1 2115 1	TCF	GCP1N

INHIBIT INCCORPORATION OF LR DATA

V58

L EXTENDED VERBS

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0345 RFF 4 LAST 262 05,1737

FBANK= CGC

L EXTENDED VERBS

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R0391 OF SOMETHING VERBS
 R0392 PLEASE PERFORM, MARK, CALIBRATE, ETC.
 R0393 1. PRESSING ENTER ON DSKY INDICATES REQUESTED ACTION HAS BEEN PERFORMED, AND THE PROGRAM DOES THE
 R0395 SAME RECALL AS A COMPLETED LOAD.
 R0396 2. THE EXECUTION OF A VERB 23 (PROOFED WITHOUT DATA) INDICATES THE REQUESTED ACTION IS NOT DESIRED.

R0398 REF 1 43,2100 SBANK= PINSUPFR FOR LOADLV1 AND SHOWSLM CADP'S.

R0399 REF 1 43,2414 0 4433 1 GCLCADLV TC FLASHOFF

R0400 REF 1 43,2415 3 4211 0 CAF PINSUPBT
 R0401 43,2416 0 0106 1 EXTEND

R0402 REF 3 LAST 229 43,2417 01 017 1 WRITE SUPERPNK

R0403 REF 8 LAST 264 43,2420 0 4635 0 TC POSTJUMP

R0404 REF 1 43,2421 6200 1 CADR LOADLV1

R0405 VERB 47 - AGS INITIALIZATION - R47.

R0406 SEE LOG SECTION AGS INITIALIZATION FOR OTHER PERTINENT REMARKS.

R0407 REF 5 LAST 274 43,2422 0 2076 1 V47TXACT TC TESTXACT NO OTHER EXTVERB.

R0408 REF 1 43,2423 3 4740 0 CAF PRI04

R0409 REF 4 LAST 265 43,2424 0 5105 0 TC FINDVAC

R0410 REF 14 LAST 209 44,1610 SBANK= AGSRUFF

R0411 REF 1 43,2425 02005 0 2CADR AGSINIT

R0411 REF 1 43,2426 64064 1

R0412 REF 8 LAST 272 43,2427 0 5155 1 TC ENDOFJOB

R0413 REF 4 LAST 106 43,2430 3 1301 1 CKMODECAD CA MODECADR

R0414 43,2431 0 0006 1 EXTEND

R0415 REF 3 LAST 268 43,2432 1 6745 0 BZF TCQ

R0416 REF 15 LAST 268 43,2433 0 2114 1 TC ALM/END SCHEMFCY IS USING MODECADR SO EXIT

L EXTENDED VERBS

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PT417	ALINTIME	VERB 55	DESCRIPTION
R0418			REQUIRE PCC OR PCC-.
R0419			1. SET EXT VERB DISPLAY BUSY FLAG.
R0420			2. DISPLAY FLASHING V25, N24 (LOAD DELTA TIME FOR AGC CLOCK).
R0421			3. REQUIRE EXECUTION OF VERB 23.
R0422			4. ADD DELTA TIME, RECEIVED FROM INPUT REGISTER, TO THE COMPUTER TIME.
R0424			5. RELEASE EXT VERB DISPLAY SYSTEM
0425	REF	6 LAST 275	43,2434 0 2076 1 ALINTIME TC TESTXACT
0426	REF	9 LAST 275	43,2435 0 4635 0 TC PCSTJUMP NO PCC IN 43
0427	REF	1	43,2436 64002 1 CACR R33
0428			42,2002 BANK 42
0429	REF	2 LAST 46	42,2000 SETLCC SPAND
0430			42,2002 BANK
0431	REF	1	COUNT# 44/R33
0432	REF	1	42,2002 3 5021 1 R33 CAF PRIC7
0433	REF	1	42,2003 0 5146 1 TC PRICCHNG
0434	REF	1	42,2004 3 2034 1 CAF VNLODCT
0435	REF	39 LAST 274	42,2005 0 4616 1 TC BANKCALL
0436	REF	4 LAST 274	42,2006 20334 1 CACR GOXDSPE
0437	REF	10 LAST 272	42,2007 0 5472 0 TC ENDEXT TERMINATE
0438	REF	11 LAST 276	42,2010 0 5472 0 TC ENDEXT PROCEED
0439	REF	1	42,2011 4 2033 1 CS DEC23 DATA IN OR RESEQUENCE (UNLIKELY)
0440	REF	36 LAST 263	42,2012 6 0154 1 AD MPAC RECALL LEFT VERB IN MPAC
0441			42,2013 0 0006 1 EXTEND
0442	REF	1	42,2014 1 2016 0 BZF UPDATIME GO AHEAD WITH UPDATE ONLY IF RECALL
0443	REF	12 LAST 276	42,2015 0 5472 0 TC ENDEXT WITH V23 (DATA IN).
0444			42,2016 0 0004 0 UPDATIME INFINT DELTA TIME IS IN CSPTM1, +1.
0445	REF	25 LAST 258	42,2017 3 4755 1 CAF ZERC
0446	REF	37 LAST 276	42,2020 54 156 1 TS MPAC +2 NEEDED FOR TP AGREE
0447	REF	21 LAST 258	42,2021 54 001 1 TS L ZERO TI + 2 WHILE ALIGNING.
0448	REF	8 LAST 254	42,2022 52 025 1 DXCH TIME2
0449	REF	38 LAST 276	42,2023 52 155 1 DXCH MPAC
0450	REF	2 LAST 102	42,2024 53 051 0 DXCH CSPTM2 +1 INCREMENT
0451	REF	39 LAST 276	42,2025 20 155 1 DAS MPAC
0452	REF	1	42,2026 0 7262 0 TC TPAGREE FORCE SIGN AGREEMENT.
0453	REF	40 LAST 276	42,2027 52 155 1 DXCH MPAC NEW CLOCK.
0454	REF	9 LAST 276	42,2030 20 025 1 DAS TIME2
0455			42,2031 0 0003 1 RELINT
0456	REF	13 LAST 276	42,2032 0 5472 0 LPDTVEND TC ENDEXT
0457			42,2033 00027 1 DEC23 DEC 23 V 23
0458			42,2034 06230 0 VNLODCT VN 2524 V25N24 FOR LOAD DELTA TIME

L EXTENDED VERBS

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PC459 SET UP FOR RAD/P SAMPLING.

0460 42,2135

BANK 42

0461 REF 3 LAST 271 43,2110

SETLCC EXTVEPRS

0462 43,2437

BANK

0463 REF 1 44,1600

FBANK= PSTACK

0464 REF 1

COUNT# 14/PG477

0465 REF 4 LAST 269 43,2437 0 2674 0 P77

TC RDRUSECK

TRY TO AVOID THE 1210.

0466 REF 5 LAST 221 43,2440 3 0077 1

CA FLAGWPD3

IS R04 RUNNING?

0467 REF 1 43,2441 7 4743 1

MASK R04FLBIT

0468 REF 71 LAST 272 43,2442 10 0000

CCS A

0469 REF 16 LAST 275 43,2443 0 2114 1

TC ALM/FND

YES.

0470 REF 7 LAST 272 43,2444 0 5514 0

TC UPFLAG

0471 REF 1 43,2445 00117 0

ADRES R77FLAG

0472 REF 1 43,2446 1 2453 0

TCF P04Z

0473 REF 5 LAST 277 43,2447 0 2674 0 R04

TC RDRUSECK

TRY TO AVOID THE 1210.

0474 REF 7 LAST 276 43,2448 1 2076 1

TC TESTXACT

0475 REF 8 LAST 277 43,2451 0 5514 0

TC UPFLAG

0476 REF 3 LAST 230 43,2452 00063 1

ADRES R04FLAG

SET P04FLAG FOR ALARMS

0477 REF 1 43,2453 3 4741 1 P04Z

CAF FBANK4

0478 REF 5 LAST 221 43,2454 54 113 0

TS FBANK

0479 REF 1 43,2455 3 2672 0

CAF 1SEC+1

SAMPLE ONCE PER SECOND

0480 REF 1 43,2456 551777 0

TS RSAMPDT

0481 REF 26 LAST 276 43,2457 3 4755 1

CAF ZERC

0482 REF 1 43,2458 551776 1

TS R1STLCC

0483 REF 1 43,2461 551575 0

TS REATLCNT

ZERO RAD SAMPLE COUNTER

0484 43,2462 0 2004 0

INHINT

0485 REF 1 43,2463 4 2673 0

CS LRPOSCAL

INITIALIZE

0486 REF 23 LAST 270 43,2464 7 0110 0

MASK RADMCDFS

BITS LP RANGE LOW SCALE =0

0487 REF 24 LAST 277 43,2465 54 110 0

TS PADMCDES

BIT6 LP PCS 1 =0

0488 REF 2 LAST 277 43,2466 3 2673 1

CAF LRPOSCAL

BIT2 RR RANGE LOW SCALE =0

0489 43,2467 0 0076 1

EXTEND

0490 REF 4 LAST 221 43,2470 02 133 0

RAND CHAN33

0491 REF 25 LAST 277 43,2471 26 110 0

ADS RADMCDES

0492 43,2472 0 0003 1

RELINT

0493 REF 6 LAST 277 43,2473 4 1077 0

CS FLAGWPD3

CHECK R04FLAG R04 =1 R77 =0

0494 REF 2 LAST 277 43,2474 7 4743 1

MASK R04FLBIT

0495 REF 72 LAST 277 43,2475 10 0000

CCS A

0496 REF 1 43,2476 1 2627 1

TCF R04K

0497 REF 12 LAST 261 43,2477 3 4753 1

CAF CME

INDICATES RENDEZVOUS DESIRED

0498 REF 4 LAST 271 43,2478 551551 0

TS OPTICMX +1

0499 REF 15 LAST 271 43,2479 3 4751 0 P04A

CAF BIT3

OPTIC CODE FOR V04N12

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0500	REF	5	LAST	277	43,2502	55'750 1	TS	OPTIONX			
0501	REF	1			43,2503	3 2667 1	CAF	V04N12X			
0502	REF	40	LAST	276	43,2504	0 4616 1	TC	BANKCALL	R2	00001	RENDEZVUS RADAR
0503	REF	3	LAST	272	43,2505	20353 0	CADR	GOMARKER		00002	LANDING RADAR
0504	REF	1			43,2506	1 2635 1	TCF	R04ENC	V34		
0505					43,2507	1 2514 1	TCF	+5	V33		
0506	REF	1			43,2510	1 2503 1	TCF	R04A +2	R2		
0507	REF	16	LAST	277	43,2511	3 4751 0	CAF	BIT3			
0508	REF	2	LAST	271	43,2512	0 5464 1	TC	BLANKET			
0509	REF	9	LAST	275	43,2513	0 5155 0	TC	ENDCFJOB			
0510	REF	6	LAST	278	43,2514	3 1051 1	CA	OPTICX +1	SAVE DESIRED OPTICX	RR =1	LR =2
0511	REF	1			43,2515	55'773 1	TS	RTSTDEX			
0512	REF	6	LAST	271	43,2516	3 6245 1	R04X CAF	SIX	RR CR LR DESIRED		
0513	REF	2	LAST	278	43,2517	7 1773 1	MASK	RTSTDFX			
0514	REF	73	LAST	277	43,2520	10 1000 0	CCS	A			
0515	REF	1			43,2521	1 2631 0	TCF	R04L	LANDING RADAR		
0516	REF	1			43,2522	55'775 1	TS	RTSTBASE	FOR RR BASE = 0, MAX = 1		
0517	REF	22	LAST	271	43,2523	3 4752 0	R04B CAF	BIT2	IS RR AUTO MODE DISCRETE PRESENT		
0518					43,2524	0 0006 1	EXTEND				
0519	REF	5	LAST	277	43,2525	02 0033 0	RAND	CFAN33			
0520					43,2526	0 0006 1	EXTEND				
0521	REF	1			43,2527	1 2540 0	BZF	R04C	YES		
0522	REF	1			43,2530	3 2671 0	CAF	201R04	REQUEST SELECTION OF RR ALTC MODE		
0523	REF	2	LAST	102	43,2531	55'044 1	TS	DSPTFM1			
0524	REF	1			43,2532	3 2670 1	CAF	V50N2EX			
0525	REF	41	LAST	276	43,2533	0 4616 1	TC	BANKCALL			
0526	REF	2	LAST	252	43,2534	20345 1	CADR	GOMARK4			
0527	REF	2	LAST	278	43,2535	1 2635 1	TCF	R04FND	V34		
0528	REF	1			43,2536	1 2523 0	TCF	R04B	V33		
0529					43,2537	1 2530 1	TCF	-7	E		
0530	REF	30	LAST	261	43,2540	3 4736 1	R04C CAF	BIT14	ENABLE RR AUTO TRACKER		
0531					43,2541	0 0006 1	EXTEND				
0532	REF	18	LAST	221	43,2542	05 0112 1	WOR	CHAN12			
0533	REF	6	LAST	271	43,2543	3 4752 0	CAF	TWC			
0534	REF	1			43,2544	55'774 0	TS	RTSTMAX	FOR SEQUENTIAL STORAGE		
0535	REF	8	LAST	253	43,2545	0 5203 0	TC	WAITLIST			
0536	REF	2	LAST	277	44,1600		EBANK=	RSTACK			
0537	REF	1			43,2546	02003 0	2CADR	RADSAMP			
0537	REF	1			43,2547	52104 0					
0538					43,2550	0 0003 1	RELINT				
0539	REF	7	LAST	277	43,2551	4 0077 0	CS	FLAGWRD3	CHECK R04FLAG	R04 =1	R77 =0
0540	REF	3	LAST	277	43,2552	7 4743 1	MASK	R04FLEIT			

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0541	REF	74	LAST	278	43,2553	17 000 0	CCS	A	
0542	REF	11	LAST	272	43,2554	1 2115 1	TCF	GCPIN	R77
0543	REF	7	LAST	278	43,2555	3 6245 1	CAF	SIX	FP CP LF
0544	REF	3	LAST	278	43,2556	7 1773 1	MASK	RTSTCEX	
0545	REF	75	LAST	279	43,2557	1 000 0	CCS	A	
0546	REF	1			43,2560	1 2575	TCF	R04LR	LR
0547	REF	1			43,2561	3 2663 0	R04RR	CAF	V16N72
0548	REF	42	LAST	278	43,2562	0 4616 1	TC	BANKCALL	DISPLAY RR CFC ANGLES (1/SEC)
0549	REF	5	LAST	261	43,2563	2 0334 1	CADR	GCMARKF	R1 + XXX.XX DEG TRUNNION
0550	REF	3	LAST	278	43,2564	1 2635 1	TCF	R04ENC	R2 + XXX.XX CFG SHAFT
0551					43,2565	1 2567 0	TCF	+2	R3 PLANK
0552	REF	1			43,2566	1 2561 0	TCF	R04RR	V34
									V33
0553	REF	1			43,2567	3 2664 1	CAF	V16N78	V32
0554	REF	43	LAST	279	43,2570	0 4616 1	TC	BANKCALL	DISPLAY PR RANGE AND RANGE RATE (1/SEC)
0555	REF	6	LAST	279	43,2571	2 0334 1	CADR	GCMARKF	R1 +- XXX.XX AM RANGE
0556	REF	4	LAST	279	43,2572	1 2635 1	TCF	R04ENC	R2 +- XXXX. FPS RANGE RATE
0557	REF	1			43,2573	1 2611 1	TCF	R04Y	R3 PLANK
0558	REF	2	LAST	279	43,2574	1 2561 0	TCF	R04PP	V34
									V33
									V32
0559	REF	1			43,2575	3 2665 0	R04LR	CAF	V16N66
0560	REF	44	LAST	279	43,2576	0 4616 1	TC	BANKCALL	DISPLAY LR RANGE AND POSITION (1/SEC)
0561	REF	7	LAST	279	43,2577	2 0334 1	CADR	GCMARKF	R1 +- XXXXX. FT LR RANGE
0562	REF	5	LAST	279	43,2578	1 2635 1	TCF	R04END	R2 + XXXXX. POS. NC.
0563					43,2579	1 2603 1	TCF	+2	R3 PLANK
0564	REF	2	LAST	279	43,2580	1 2575 0	TCF	R04LR	V34
									V33
									V32
0565	REF	1			43,2583	3 2666 0	CAF	V16N67	DISPLAY LR VFLX, VFLY, VELZ (1/SEC)
0566	REF	45	LAST	279	43,2584	0 4616 1	TC	BANKCALL	R1 +- XXXXX. FRS LR V(X)
0567	REF	8	LAST	279	43,2585	2 0334 1	CADR	GCMARKF	R2 +- XXXXX. FPS LR V(Y)
0568	REF	6	LAST	279	43,2586	1 2635 1	TCF	R04END	R3 +- XXXXX. FPS LR V(Z)
0569	REF	2	LAST	279	43,2587	1 2611 1	TCF	R04Y	V34
0570	REF	3	LAST	279	43,2588	1 2575 0	TCF	R04LR	V33
									V32
0571	REF	27	LAST	277	43,2611	3 4755 1	R04Y	CAF	ZFRO
0572	REF	2	LAST	277	43,2612	55 1777 0	TS	RSAMPDT	TO TERMINATE SAMPLING
0573	REF	46	LAST	279	43,2613	0 4616 1	TC	BANKCALL	
0574	REF	2	LAST	272	43,2614	0 1735 1	CADR	2SECELY	WAIT FOR LAST RADARUPT
0575	REF	2	LAST	277	43,2615	3 2672 0	CAF	1STC+1	SAMPLE ONCE PER SECCND
0576	REF	3	LAST	279	43,2616	55 1777 0	TS	RSAMPDT	
0577	REF	28	LAST	279	43,2617	3 4755 1	CAF	ZFRO	FOR STORING RESULTS
0578	REF	2	LAST	277	43,2620	55 1776 1	TS	RTSTLOC	
0579	REF	6	LAST	279	43,2621	3 6245 1	CAF	SIX	
0580	REF	4	LAST	279	43,2622	7 1773 1	MASK	RTSTCEX	
0581	REF	76	LAST	279	43,2623	17 000 0	CCS	A	
0582	REF	13	LAST	277	43,2624	4 4753 0	CS	ONE	WAS LR
0583	REF	7	LAST	278	43,2625	6 4752 0	AD	TWC	WAS RF
0584	REF	1			43,2626	1 2515 0	TCF	PC4X -1	

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0585	REF	1		43,2627	3 4766	1	RC4K	CAF	250MS+1	SAMPLE 4 LR COMPONENTS PER SECOND.
0586	REF	4	LAST	279	43,2630	55'777	1	TS	RSAMPDT	
0587	REF	8	LAST	279	43,2631	3 4752	0	RC4L	CAF	TWC
0588	REF	2	LAST	278	43,2632	55'775	1	TS	RTSTBASE	FOR LR BASE = 2, MAX = 3
0589	REF	9	LAST	279	43,2633	3 6245	1	CAF	SIX	
0590	REF	2	LAST	278	43,2634	1 2544	1	TCF	RC4C +4	
0591	REF	29	LAST	279	43,2635	3 4755	1	RC4ENC	CAF	ZERO
0592	REF	5	LAST	280	43,2636	55'777	0	TS	RSAMPDT	ZERO RSAMPDT
0593	REF	2	LAST	258	43,2637	3 4744	1	CAF	BIT8	TO TERMINATE SAMPLING
0594	REF	47	LAST	279	43,2640	0 4616	1	TC	BANKCALL	WAIT 1.28 SECONDS FOR POSSIBLE
0595	REF	4	LAST	270	43,2641	01736	1	CADR	DELAYJCB	PENDING RUPT.
0596					43,2642	0 0004	0		INHINT	
0597	REF	31	LAST	278	43,2643	4 4736	0	CS	BIT14	DISABLE RR AUTO TRACKER
0598					43,2644	0 0006	1		EXTEND	
0599	REF	19	LAST	278	43,2645	03 012	1	WAND	CHAN12	
0600	REF	18	LAST	272	43,2646	0 5516	0	TC	DOWNFLAG	
0601	REF	4	LAST	277	43,2647	00063	1	ADRES	RC4FLAG	SIGNAL END OF RC4.
0602	REF	14	LAST	276	43,2650	0 5472	0	TC	ENDEXT	
0603	REF	2	LAST	277	43,2651	3 4741	1	R77END	CAF	EBANK4
0604	REF	6	LAST	277	43,2652	54 003	0	TS	EBANK	TO TERMINATE SAMPLING
0605	REF	30	LAST	280	43,2653	3 4755	1	CAF	ZERO	
0606	REF	6	LAST	280	43,2654	55'777	0	TS	RSAMPDT	
0607	REF	31	LAST	261	43,2655	3 4746	0	CAF	BIT6	WAIT 320 MS FOR POSSIBLE
0608	REF	48	LAST	280	43,2656	0 4616	1	TC	BANKCALL	PENDING RUPT.
0609	REF	5	LAST	280	43,2657	01736	1	CADR	DELAYJCB	
0610	REF	19	LAST	280	43,2660	0 5516	0	TC	DOWNFLAG	
0611	REF	2	LAST	277	43,2661	00117	0	ADRES	R77FLAG	
0612	REF	12	LAST	279	43,2662	1 2115	1	TCF	GCPIN	
0613					43,2663	04110	0	V16N72	VN	1672
0614					43,2664	04116	0	V16N78	VN	1678
0615					43,2665	04102	0	V16N66	VN	1666
0616					43,2666	04103	1	V16N67	VN	1667
0617					43,2667	01014	0	V04N12X	VN	412
0618					43,2670	14431	1	V50N25X	VN	5025
0619					43,2671	00201	1	201R04	CCT	00201
0620					43,2672	00145	1	ISEC+1	DEC	101
0621	REF	1			4766			25JMS+1	EQUALS	CALLCODE
0622					43,2673	00444	0	LPPOSAL	CCT	444

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0623	REF	8	LAST	278	43,2674	4 0077 0	RRUSECK	CS	FLAGWRD3	IS R29 ON?
0624	REF	2	LAST	271	43,2675	7 4741 0		MASK	RR29FBIT	
0625	REF	77	LAST	279	43,2676	10 000 0		CCS	A	
0626	REF	17	LAST	277	43,2677	0 2114 1		TC	ALM/END	YES
0627	REF	10	LAST	221	43,2700	3 0101 1		CA	FLAGWRD5	IS R77 RUNNING?
0628	REF	2	LAST	221	43,2701	7 4741 0		MASK	R77FLBIT	
0629	REF	78	LAST	281	43,2702	10 000 0		CCS	A	
0630	REF	18	LAST	281	43,2703	0 2114 1		TC	ALM/END	YES.
0631	REF	3	LAST	229	43,2704	4 0103 1		CS	FLAGWRD7	IS SERVICER RUNNING AND FENCE POSSIBLY
0632	REF	2	LAST	229	43,2705	7 4746 1		MASK	V37FLBIT	R12 USING THE LR?
0633	REF	79	LAST	281	43,2706	10 000 0		CCS	A	
0634	REF	1			43,2707	1 2714 0		TCF	CHECKER	NO
0635	REF	2	LAST	230	43,2710	2 0107 1		CA	FLAGWRD11	YES, IS R12 ON?
0636	REF	2	LAST	230	43,2711	7 4735 0		MASK	LEPYBIT	BIT 15
0637					43,2712	0 0006 1		EXTEND		
0638	REF	19	LAST	281	43,2713	1 2114 0		BZF	ALM/END	YES
0639	REF	9	LAST	232	43,2714	4 0075 1	CHECKRR	CS	FLAGWRD1	IS THE TRACK FLAG SET AND FENCE POSSIBLY
0640	REF	1			43,2715	7 4747 0		MASK	TRACKBIT	P20 USING THE RR?
0641	REF	30	LAST	281	43,2716	10 000 0		CCS	A	
0642	REF	24	LAST	262	43,2717	0 0002 0		TC	C	NCT ALLOWED DURING P20
0643	REF	20	LAST	281	43,2720	0 2114 1		TC	ALM/END	P22 OR P25, (R65)
0653	REF	3	LAST	271 TC	276:	80 287#		CCUNT#	\$\$/EXTVB	
0655	REF	8	LAST	277	43,2721	0 2176 1	VB64	TC	TESTXACT	IF DISPLAY SYS. NCT BUSY, MAKE IT BUSY.
0656	REF	2	LAST	275	43,2722	3 4740 0		CAF	PR104	
0657	REF	5	LAST	275	43,2723	0 5105 0		TC	FINDVAR	
0658	REF	3	LAST	119	54,1600			FEANK=	ALPHASB	
0659	REF	1			43,2724	0 3606 1		2CAGR	SBANDANT	CALC., DISPLAY S-BAND ANTENNA ANGLES.
0659	REF	1			43,2725	0 6410 0				
0660	REF	10	LAST	278	43,2726	0 3155 0		TC	ENDOFJOB	

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PO661	IMUATTCK	VERB 43	DESCRIPTION
PO662	LOAD IMU ATTITUDE ERROR METERS		
PO663	1. REQUIRE PCC OR FRESH START.		
PO664	2. REQUIRE COARSE ALIGN ENABLE AND ZERO ICDU BITS OFF.		
PO665	3. REQUIRE THAT NEEDLES BE OFF.		
PO666	4. REQUEST LOAD OF N22 (VALUES TO BE DISPLAYED).		
PO667	5. ON PROCEED OR ENTER RE-DISPLAY V43 AND SEND PULSES.		
0668	REF 1	43,2727 0 2117 1	IMUATTCK TC CHKPCCH VB 76 - LOAD IMU ATT. ERROR METERS
0669	REF 3 LAST 181	43,2730 3 4763 1	CAF BITS485 SEE IF COARSE ALIGN ENABLE AND ZERO IMU
0670		43,2731 0 0006 1	EXTEND CELS BITS ARE ON
0671	REF 20 LAST 280	43,2732 02 012 0	RAND CHAN12
0672	REF 81 LAST 281	43,2733 10 000 0	CCS A
0673	REF 21 LAST 281	43,2734 1 2114 0	TCF ALW/END NOT ALLOWED IF IMU COARSE OR IMU ZERO ON
0674	REF 1	43,2735 3 4355 0	CAF BIT13-14 BOTH BITS 13 AND 14 MUST BE 1
0675		43,2736 0 0006 1	EXTEND INDICATING THE MODE SELECTED IS OFF.
0676	REF 1	43,2737 06 031 0	RXCR CHAN31
0677	REF 2 LAST 282	43,2740 7 4355 1	MASK BIT13-14
0678		43,2741 0 0006 1	EXTEND
0679		43,2742 1 2744 0	BZF +2
0680	REF 22 LAST 282	43,2743 1 2114 0	TCF ALW/END EXIT. NEEDLES IS ON.
0681	REF 9 LAST 281	43,2744 0 2076 1	TC TESTXACT
0682	REF 2 LAST 268	43,2745 3 2226 0	CAF VNLODCDL
0683	REF 49 LAST 280	43,2746 0 4616 1	TC BANKCALL
0684	REF 5 LAST 276	43,2747 20334 1	CADR GCXDSFF
0685	REF 15 LAST 280	43,2750 0 5472 0	TC ENDEXT V34
0686		43,2751 0 2752 0	TC +1
0687	REF 1	43,2752 3 2765 1	CAF V43K
0688	REF 50 LAST 282	43,2753 0 4616 1	TC BANKCALL
0689	REF 5 LAST 274	43,2754 20621 0	CADR EXCSFRET
0690	REF 32 LAST 280	43,2755 3 4746 0	CAF BIT6
0691		43,2756 0 0006 1	EXTEND
0692	REF 21 LAST 282	43,2757 05 012 1	WCR CHAN12
0693	REF 9 LAST 280	43,2760 3 4752 0	CAF TWO
0694	REF 5 LAST 278	43,2761 0 5203 0	TC WAITLIST
0695	REF 4 LAST 99	0321	EBANK= THETAC
0696	REF 1	43,2762 02035 0	2CADR ATTCK2
0696	REF 1	43,2763 64100 1	
0697	REF 16 LAST 282	43,2764 1 5472 1	TCF ENDEXT
0698		42,2035	BANK 42
0699	REF 1	42,2000	SETLCC PINBALL3
0700		42,2035	BANK
0701	REF 1		COUNT* \$\$/EXTVE

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0702	REF	10	LAST	282	42,2135	3 4752 0	ATTCK2	CAF	TWO	PLT DLT COMMANDS.
0703	REF	25	LAST	281	42,2136	54 002 1	+1	IS	Q	CCU WILL LIMIT EXCESS DATA.
0704	REF	82	LAST	282	42,2137	50 000 1		INDEX	A	
0705	REF	5	LAST	282	42,2140	3 0321 1		CA	THETAD	
0716					42,2141	0 0006 1		EXTEND		
0717	REF	1			42,2142	7 2053 1		MP	ATTSCALE	
0718	REF	26	LAST	283	42,2142	50 002 0		INDEX	Q	
0719	REF	2	LAST	175	42,2144	56 050 1		XCH	CDLXCMD	
0710	REF	27	LAST	283	42,2145	10 002 1		CCS	Q	
0711	REF	2	LAST	282	42,2146	1 2136 1		TCF	ATTCK2 +1	
0712	REF	1			42,2147	2 7743 0		CAF	13,14,15	
0713					42,2150	0 0006 1		EXTEND		
0714	REF	6	LAST	221	42,2051	05 014 1		WCR	CHAN14	
0715	REF	4	LAST	239	42,2152	1 5261 0		TCF	TASKOVER	LEAVE ERROR COUNTERS ENABLED.

0716 42,2053 03146 1 ATTSCALE DEC 0.1

0717					47,2667			BANK	7	
0718	REF	4	LAST	277	43,2710			SETLOC	EXTVERBS	
0719					43,2765			BANK		

0720 REF 4 LAST 281 TC 282: 36 323* COUNT# 1\$/EXTVB

0721 43,2765 12611 1 V43K VN 4300
 0722 V82REF VERR 82 DESCRIPTION
 0723 REQUEST ORBIT PARAMETERS DISPLAY (R2C)
 0724 1. IF AVERAGE G IS OFF:
 0725 FLASH DISPLAY V04N06. R2 INDICATES WHICH SHIP'S STATE VECTOR IS
 0726 TO BE UPDATED. INITIAL CHOICE IS THIS SHIP (R2=1). ASTRONAUT
 0727 CAN CHANGE TO OTHER SHIP BY V22EXE, WHERE X NOT EQ 1.
 0728 SELECTED STATE VECTOR UPDATED BY THISPREC (CITHPREC).
 0729 CALLS SR30.1 (WHICH CALLS TFFCCMU + TFFP/RA) TO CALCULATE
 0730 RPER (PERIGEE RADII), RAPC (APOGEE RADIUS), HPER (PERIGEE
 0731 HEIGHT ABOVE LAUNCH PAD OR LUNAR LANDING SITE), HAPC (APOGEE
 0732 HEIGHT AS ABOVE), TPER (TIME TO PERIGEE), TFF (TIME TO
 0733 INTERSECT 300 KFT ABOVE PAD OR 35KFT ABOVE LANDING SITE).
 0734 FLASH MONITOR V16N44 (HAPC, HPER, TFF). TFF IS -59M59S IF IT WAS
 0735 NOT COMPUTABLE, OTHERWISE IT INCREMENTS ONCE PER SECOND.
 0736 ASTRONAUT HAS OPTION TO MONITOR TPER BY KEYING IN A 32 F.
 0737 DISPLAY IS IN HRS, IS NEGATIVE (AS WAS TFF), AND INCREMENTS
 0738 ONCE PER SECOND ONLY IF TFF DISPLAY WAS -59M59S.

0739 2. IF AVERAGE G IS ON:
 0740 CALLS SR30.1 APPROX EVERY TWO SECS. STATE VECTOR IS ALWAYS
 0741 FOR THIS VEHICLE. V82 DOES NOT DISTURB STATE VECTOR. RESULTS
 0742 OF SR30.1 ARE RAPC, RPER, HAPC, HPER, TPER, TFF.
 0743 FLASH MONITOR V16N44 (HAPC, HPER, TFF).
 0744 IF MODE IS P11, THEN CALL DELRSPL SO ASTRONAUT CAN MONITOR
 0745 RESULTS BY MODE. SFLASH COMPUTATION DONE ONCE PER TWO SECS.

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0746	REF	10	LAST	282	43,2766	0 2076 1	V82PERF	TC	TESTXACT	
0747	REF	2	LAST	276	43,2767	3 5021 1		CAF	PRI07	LESS THAN LAMBERT. R30,V82
0748	REF	2	LAST	276	43,2770	0 5146 1		TC	PRI0CHNG	
0749					43,2771	0 3006 1			FXTEND	
0750	REF	1			43,2772	3 2775 0		CCA	V82CCN	
0751	REF	1			43,2773	0 5165 0		TC	SLDPXCHZ	V82CALL IN DIFF SUPERBANK FROM V82PERF
0752	REF	2	LAST	118	E4,1716				FRANK= H4PC	
0753	REF	1			43,2774	03242 0	V82CCN	2CADR	V82CALL	
0753	REF	1			43,2775	44104 1				

R0754					V883PERF		VERR 83		DESCRIPTION	
R0755									REQUEST RENDEZVOUS PARAMETER DISPLAY (R31)	
R0756									1. SET EXT VERR DISPLAY BUSY FLAG.	
R0757									2. SCHEDULE R31CALL WITH PRIORITY 5.	
R0758									A. DISPLAY	
R0759							R1	RANGE		
R0760							R2	RANGE RATE		
R0761							R3	THETA		

0762	REF	11	LAST	284	43,2776	0 2076 1	V83PERF	TC	TESTXACT	
0763	REF	23	LAST	278	43,2777	3 4752 0		CAF	BIT2	
0764	REF	10	LAST	282	43,3000	0 5203 0		TC	WAITLIST	
0765	REF	1			E7,1611				EBANK= TSTRT	
0766	REF	1			43,3001	03737 1		2CADR	R31CALL	
0766	REF	1			43,3002	64107 1				
0767	REF	11	LAST	281	43,3003	0 5155 0		TC	ENDCFJCB	

R0769 VERR 89 DESCRIPTION RENDEZVOUS FINAL ATTITUDE ROUTINE (R63)

R0769 CALLED BY VERR 89 ENTER DURING P00. PRI0 10 USED. CALCULATES AND
 R0770 DISPLAYS FINAL FCAI BALL ANGLES TO POINT LM +X OR +Z AXIS AT CSM.

R0771 1. KEY IN V 89 E ONLY IF IN PFCG 00. IF NOT IN P00, OPERATOR ERROR AND
 R0772 EXIT R63, OTHERWISE CONTINUE.

R0773 2. IF IN P00, DO IMU STATUS CHECK ROUTINE (R02BCTH). IF IMU ON AND ITS
 R0774 ORIENTATION KNOWN TO LGC, CONTINUE.

R0775 3. FLASH DISPLAY V 04 N 06. R2 INDICATES WHICH SPACECRAFT AXIS IS TO
 R0776 BE POINTED AT CSM. INITIAL CHOICE IS PREFERRED (+Z) AXIS (R2=1).
 R0777 ASTRONAUT CAN CHANGE TO (+X) AXIS (R2 NOT = 1) BY V 22 E 2 E. CONTINUE
 R0778 AFTER KEYING IN PFCFED.

R0779 4. BOTH VEHICLE STATE VECTORS UPDATED BY CONIC EGS.

R0780 5. HALF MAGNITUDE UNIT LOS VECTOR (IN STABLE MEMBER COORDINATES) AND

L EXTENDED VERBS

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R0781 HALF MAGNITUDE UNIT SPACECRAFT AXIS VECTOR (IN BODY COORDINATES)
 R0782 PREPARED FOR VECTORINT.

R0783 6. CUMUL ANGLES FROM VECTORINT TRANSFORMED INTO FCAL BALL ANGLES BY
 R0784 BALLANGS. FLASH DISPLAY V 06 N 18 AND AWAIT RESPONSE.

R0785 7. RECYCLE - RETURN TO STEP 4.
 R0786 TERMINATE - EXIT P43.
 R0787 PROCEED - RESET AXISFLG AND CALL R6CLEM FOR ATTITUDE MANEUVER.

R0788	REF	2	LAST	282	43,3004	0 2117 1	V89PERF	TC	CHKPOOH
R0789	REF	12	LAST	284	43,3005	0 2076 1		TC	TFSTXACT
R0790	REF	1			43,3006	0 4737 0		CAF	PRIC10
R0791	REF	6	LAST	281	43,3007	0 5105 0		TC	FINDVAC
R0792	REF	3	LAST	118	54,1606				EBANK= RCAF
R0793	REF	1			43,3010	0 2022 0		2CADR	V89CALL
R0794	REF	1			43,3011	54104 0			
R0794	REF	12	LAST	284	43,3012	0 5155 0		TC	ENDOFJCB

R0795	V89PERF	VERP 90	DESCRIPTION
R0796			REQUEST RENDEZVOUS OUT-OF-PLANE DISPLAY (P36)
R0797			1. SET EXT VERB DISPLAY BUSY FLAG.
R0798			2. SCHEDULE R36 CALL WITH PRIORITY 10
R0799			A. DISPLAY
R0800			TIME OF EVENT - HOURS, MINUTES, SECONDS
R0801			Y OUT-OF-PLANE POSITION - NAUTICAL MILES
R0802			YDOT OUT-OF-PLANE VELOCITY - FEET/SECOND
R0803			PSI ANGLE BTW LINE OF SIGHT AND FORWARD
R0804			DIRECTION VECTOR IN HORIZONTAL PLANE - DEGREES

R0805	REF	12	LAST	285	43,3013	0 2076 1	V89PERF	TC	TFSTXACT
R0806	REF	3	LAST	284	43,3014	3 5221 1		CAF	PR107
R0807	REF	7	LAST	285	43,3015	0 5105 0		TC	FINDVAC
R0808	REF	2	LAST	118	54,1606				EBANK= RPASS36
R0809	REF	1			43,3016	0 2640 1		2CADR	R36
R0809	REF	1			43,3017	1 104 0			
R0810	REF	13	LAST	285	43,3020	1 5155 1		TCF	ENDOFJOB

R0811	MINIMP	VERP 76	DESCRIPTION
R0812			MINIMUM IMPULSE MODE
R0813			1. SET MINIMUM IMPULSE RFC MODE FLAG TO 1.

R0814	REF	6	LAST	277	43,3021	0 5504 0	MINIMP	TC	UPFLAG	SET PULSES = 1 (MIN. IMPULSE MODE)
R0815	REF	1			43,3022	0 0203 1		ADRES	PULSFLG	
R0816	REF	13	LAST	280	43,3023	1 2115 1		TCF	GOPIN	RETURN VIA PINBRNCH

R0817	NOMINTMP	VERP 77	DESCRIPTION
R0818			SAFE COMMAND MODE
R0819			1. SET MINIMUM IMPULSE RFC MODE FLAG TO 0. (ZERO INDICATES NOT MINIMUM IMPULSE MODE.).
R0820			2. MOVE COLX,COLY,COLZ INTO COLXC,COLYC,COLZD.

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0822	PEF	20	LAST	285	43,3024	0 5516 0	NCMINIMP	TC	DOWNFLAG	SET PULSES = 0 (NOT MINIMUM IMPULSE MODE)
0823	REF	2	LAST	285	43,3025	00303 1		ADRES	PULSEFLG	
08235 *					43,3026	0 0004 0		INFINT		
0824	PEF	11	LAST	245	43,3027	0 4674 0		TC	IBMKCALL	
0825	PEF	1			43,3030	40154 0		CADR	ZATTEROR	
0826	REF	14	LAST	285	43,3031	0 2115 0		TC	GOPIN	

L EXTENDED VERBS

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P0827 CREWMANU VERB 49 DESCRIPTION
 P0828 START AUTOMATIC ATTITUDE MANEUVER
 P0829 1. REQUIRE PROGRAM 4) ACTIVE.
 P0830 2. SET EXT VERB DISPLAY BUSY FLAG.
 P0831 3. SCHEDULE P62DISP WITH PRIORITY 10.
 P0832 4. RELEASE EXT VERB DISPLAY.

P0833 R62DISP
 P0834 1. DISPLAY FLASHING V06,N22.
 P0835 RESPONSES
 P0836 A. TERMINATE
 P0837 1. GO TO GCTCPCH.
 P0838 B. PROCEED
 P0839 1. SET 3AXISFLC TO INDICATE MANEUVER IS SPECIFIED BY 3 AXIS.
 P0841 2. EXECUTE P6JLEV (ATTITUDE MANEUVER).
 P0842 C. ENTER
 P0843 1. REPEAT FLASHING V06,N22.

0844	REF	3	LAST	285	43,3032	0 2117 1	CREWMANU TC	CHK PCH	DEMAND PCH
0845	REF	14	LAST	285	43,3033	0 2076 1	TC	TESTXACT	
0846	REF	2	LAST	285	43,3034	3 4737 0	CAF	PRICIC	
0847	REF	8	LAST	285	43,3035	0 5105 0	TC	FINDVAC	
0848	REF	2	LAST	136	56,1676		ERANK=	BCDU	
0848	REF	1			43,3036	02103 1	2CADR	P62DISP	
0849	REF	1			43,3037	46106 1			
0850	REF	14	LAST	285	43,3040	0 5155 0	TC	ENDOFJOB	

L EXTENDED VERBS

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R0851 TRMTRACK VERB 56 DESCRIPTION
 R0852 TERMINATE TRACKING (P2) AND P25).
 R0853 1. KNOCK DOWN RENDEZVOUS, TRACK, AND UPDATE FLAGS.
 R0854 2. REQUIRE P2) OF P25 NOT RUNNING ALONE OR GO TO GOTOPOCH (REQUEST PROGRAM CO).
 R0856 3. SCHEDULE V56TCVAC WITH PRIORITY 30.

R0857 V56TCVAC
 R0858 1. EXECUTE INTSTALL (IF INTEGRATION IS RUNNING, STALL UNTIL IT IS FINISHED.).
 R0860 2. ZERO GROUP 2 TO HALT P20.
 R0861 3. TRANSFER CONTROL TO GCPRC2 (SOFTWARE RESTART).

0862 REF 1 43,3041 3 3061 0 TRMTRACK CA BITS9+7 IS REFC CR P25 FLAG ON

0863 REF 18 LAST 232 43,3042 7 0074 0 MASK FLAGWRD0

0864 43,3043 1 0076 1 EXTEND

0865 REF 15 LAST 286 43,3044 1 2115 1 BZF GCPIN NC

0866 REF 21 LAST 286 43,3045 0 5516 0 TC DOWNFLAG

0867 REF 1 43,3046 0 0010 0 ADRES RNCVZFLG

0868 REF 22 LAST 288 43,3047 0 5516 0 TC DOWNFLAG

0869 REF 1 43,3050 0 0010 1 ADRES P25FLAG

0870 REF 23 LAST 288 43,3051 0 5516 0 TC DOWNFLAG

0871 REF 1 43,3052 0 0003 0 ADRES SRCHOPTN

ENSURE SEARCH FLAG IS CFF

0872 REF 2 LAST 281 43,3053 3 4747 1 CA TRACKBIT

0873 REF 10 LAST 281 43,3054 7 0075 1 MASK FLAGWRD1

IS TRACK FLAG CN?

0874 43,3055 0 0076 1 EXTEND

0875 REF 16 LAST 288 43,3056 1 2115 1 BZF GCPIN

0876 REF 10 LAST 276 43,3057 0 4635 0 TC PCSTJUMP

0877 REF 1 43,3060 64054 1 CAER TRMTRAK1

0878 43,3061 00500 1 BITS9+7 CCT 500

0879 REF 3 LAST 276 42,2000 SEILCC SBAND

BANK 42

0880 42,2054 BANK

0881 REF 2 LAST 282 TO 283: 15 15* COUNT* \$\$/EXTVE

0882 REF 24 LAST 288 42,2054 0 5516 0 TRMTRAK1 TC DOWNFLAG

0883 REF 1 42,2055 00027 1 ADRES UPDATFLG

UPDATE FLAG DOWN

0884 REF 25 LAST 288 42,2056 0 5516 0 TC DOWNFLAG

0885 REF 1 42,2057 00031 0 ADRES TRACKFLG

TRACK FLAG DOWN

0886 REF 26 LAST 288 42,2060 0 5516 0 TC DOWNFLAG

0887 REF 2 LAST 232 42,2061 00007 0 ADRES INLSE

0888 REF 6 LAST 252 42,2062 0 6042 1 TC INTPPET

0889 42,2063 77624 1 CALL

0890 REF 3 LAST 237 42,2064 27412 0 INTSTALL

DO NOT INTERRUPT INTEGRATION

L EXTENDED VERBS

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0891				42,2065	77776 1	EXIT		
0892	REF	2	LAST	229	42,2066 0 5353 1	TC	PHASCHNG	
0893					42,2067 0002 0	COT	2	KILL GROUP 2 TO HALT P20 ACTIVITY
0894					42,2070 0 004 0	INHINT		
0895	REF	12	LAST	286	42,2071 0 4674 0	TC	IPNKCALL	ZERO THE COMMANDED RATES TO STOP
0896	REF	1			42,2072 47166 1	CADR	STOPPATE	MANEUVER
0897	REF	13	LAST	289	42,2073 0 4674 0	TC	IPNKCALL	
0898	REF	1			42,2074 40115 0	CADR	RESTORCF	
0899	REF	4	LAST	270	42,2075 0 6111 1	TC	CLRADMCC	CLEAR BITS 10 + 15 OF RADMCCS.
0900	REF	32	LAST	280	42,2076 4 4736 0	CS	BIT14	DISABLE LOCKEN
0901					42,2077 0 0006 1	EXTEND		
0902	REF	22	LAST	282	42,2100 03 012 1	WAND	CHAN12	
0903	REF	11	LAST	288	42,2101 0 4635 0	TC	PCSTJUMP	
0904	REF	2	LAST	231	42,2102 12766 0	CADR	GCPROC2	CAUSE RESTART.

R0905 DNECUMP VERB 74 DESCRIPTION
 R0906 INITIALIZE DOWN-TELEMETRY PROGRAM FOR ERASABLE MEMORY CUMP.
 R0907 1. SET EXT VERB DISPLAY RLSY FLAG.
 R0908 2. REPLACE CURRENT DOWNLIST WITH ERASABLE MEMORY.
 R0909 3. RELEASE EXT VERB DISPLAY.

0910	REF	5	LAST	283	43,2000	SETLOC	EXTVERBS	
0911					43,3062	BANK		
0912	REF	5	LAST	283 TO 288:	61 384*	CCOUNT*	\$/EXTVE	
0913					7411	EBANK=	400	
0914	REF	1			43,3062 3 3165 1	CAF	LDNDUMPI	
0915	REF	3	LAST	220	43,3063 54 335 0	TS	DNTMGCTC	
0916	REF	17	LAST	288	43,3064 0 2115 0	TC	GOPIN	
0917	REF	2	LAST	262	43,3062	V74	FQALS DNECUMP	
0918	REF	1			43,3065 03706 0	LDNDUMPI	REMADE DNDUMPT	

R0919 LEMVEC VERB 81 DESCRIPTION
 R0920 UPDATE LEM STATE VECTOR
 R0921 RESET VEHUPFLG TO 0

0922	REF	27	LAST	288	43,3066 0 5516 0	LEMVEC	TC	DOWNFLAG	
0923	REF	1			43,3067 00026 0	ADRES	VEHUPFLG		VB 80 - VEHUPFLG DOWN INDICATES LEM
0924	REF	1			43,3070 0 3073 0	TC	NCUPDOWN		
R0925	LEMVEC	VERB 81	DESCRIPTION						
R0926	UPDATE LEM STATE VECTOR								

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R0927 SET VEHUPFLG TO 1

0928	REF	10	LAST	285	43,3071	0 5504 0	CSMVEC	TC	UPFLAG	
0929	REF	2	LAST	286	43,3072	00026 0		ADRES	VEHUPFLG	VB 81 - VEHUPFLG UP INDICATES CSM
0930	REF	28	LAST	289	43,3073	0 5516 0	NCUPDOWN	TC	DOWNFLAG	
0931	REF	1			43,3074	00030 1		ADRES	NCUPFLAG	
0932	REF	18	LAST	289	43,3075	1 2115 1		TCF	GCPIN	

R0933 UPDATOFF VERB95 DESCRIPTION
R0934 INHIBIT STATE VECTOR UPDATES BY INCCFF
R0935 SET NCUPFLAG TO 1

0936	REF	11	LAST	290	43,3076	0 5504 0	UPDATOFF	TC	UPFLAG	VB 95 SET NCUPFLAG
0937	REF	2	LAST	290	43,3077	00030 1		ADRES	NCUPFLAG	
0938	REF	19	LAST	290	43,3100	0 2115 0		TC	GCPIN	

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R0939				SYSTEST	VTR 92				DESCRIPTION		
R0940									OPERATE IMU PERFORMANCE TEST.		
R0941									1. REQUIRE PROGRAM 03 OR TURN ON OPERATOR ERROR.		
R0942									2. SET EXT VERB BUSY FLAG.		
0943	REF	2	LAST	128	43,3101	0 2117 1			EPANK= GPLACE		
0944	REF	4	LAST	287	43,3101	0 2117 1	SYSTEST	TC	CHKPCCCH	DEMANE FCC	
0945	REF	15	LAST	287	43,3102	0 2076 1		TC	TESTXACT		
0946	REF	1			43,3103	0 7712 0	CAF		PRIC22		
0947	REF	9	LAST	287	43,31 4	0 5105 0	TC		FINDVAC		
0948	REF	3	LAST	291	43,3106	0 76065 0			FBANK= GPLACE		
0949	REF	1			37,2000				SBANK= IMULPER		
0950	REF	1			43,3105	0 2002 1			20ADR REDD		
0950	REF	1			43,3106	0 76065 0					
0951	REF	15	LAST	287	43,3107	0 5155 0	TC		ENDOFJOB		
R0952	VERB	93							CLEAR RENCWFLG, CAUSES W-MATRIX TO BE RE-INITIALIZED.		
0953					43,3110	0 0004 0	WMATRIX		INHINT		
0954	REF	1			43,3111	0 4753 0	CS		RENDWBIT		
0955	REF	11	LAST	281	43,3112	0 0101 0	MASK		FLAGWPD5		
0956	REF	12	LAST	291	43,3113	0 54 101 0	TS		FLAGWPD5		
0957	REF	20	LAST	290	43,3114	0 2115 1	TC		GOPIN		
0958	REF	1			43,3115		GOSHCSUM		EQUALS SHOWSUM		
0959	REF	5	LAST	291	43,3115	0 2117 1	SHOWSUM	TC	CHKPCCCH	*	
0960	REF	16	LAST	291	43,3116	0 2076 1	TC		TESTXACT	*	
0961	REF	4	LAST	285	43,3117	0 5021 1	CAF		PRIC7		ALLOW OTHER CHAPINS.
0962	REF	3	LAST	284	43,3121	0 5146 1	TC		PRIOGENE		
0963	REF	1			43,3121	0 4753 1	CAF		S+1	*	
0964	REF	2	LAST	109	43,3122	0 551376 0	TS		SKEPP6	*	SHOWSUM OPTICA
0965	REF	1			43,3123	0 4755 1	CAF		S+ZFRD	*	
0966	REF	3	LAST	212	43,3124	0 551362 0	TS		SMCCF	*	TURN OFF SELF-CHECK
0967	REF	1			43,3125	0 2266 0	CA		SELFADRS	*	
0968	REF	2	LAST	223	43,3126	0 551361 0	TS		SELFRET	*	
0969	REF	1			43,3127	0 3543 0	TC		STSHOWSUM	*	ENTER ROPECHK
0970	REF	2	LAST	108	43,3130	0 231372 0	SDISPLAY	LXCF	SKEEP2	*	BANK # FOR DISPLAY
0971	REF	2	LAST	109	43,3131	0 231373 1		LXCF	SKFFP3	*	EUGGER WORD FOR DISPLAY
0972	REF	1			43,3132	0 3265 0	CA		ADPS1	*	
0973	REF	41	LAST	276	43,3133	0 54 156 1	TS		MPAC +2	*	
0974	REF	1			43,3134	0 23145 1	CA		VNCCN	*	0501
0975	REF	51	LAST	282	43,3135	0 4616 1	TC		BANKCALL	*	
0976	REF	6	LAST	282	43,3136	0 20334 1	CAER		GCXDSPF	*	
0977					43,3137	0 3142 0	TC		+3	*	
0978	REF	1			43,3141	0 3654 0	TC		NXTRNK	*	

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0979	REF	1		43,3141	0 3122 1	TC	NCKILL	*
0980	REF	2	LAST 291	43,3142	3 3266 0	CA	SELFADRS	
0981	REF	2	LAST 108	43,3143	55 371 1	TS	SKEEP1	
0982	REF	17	LAST 282	43,3144	0 5472 0	TC	ENDEXT	*
0983				43,3145	01201 0	VACON	VN 501	*
0984	REF	3	LAST 291	43,3146	2 1376 1	ENDSUNS	CA SKEEP6	*
0985				43,3147	0 0006 1	EXTEND		*
0986	REF	2	LAST 222	43,3150	1 3357 1	BZF	SELFCHK	* ROPECHK, START SELFCHK AGAIN.
0987	REF	2	LAST 291	43,3151	0 3543 0	TC	SISHCSUM	* START SHCWSUM AGAIN.

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R0988 DAPDISP VERB 48 DESCRIPTION
 R0989 LOAD AUTO PILOT DATA
 R0990 1. REQUIRE EXT VERB DISPLAY AVAILABLE AND SET BUSY FLAG.
 R0991 2. EXECUTE DAPDATA1, DAPDATA2, AND DAPDATA3.
 R0992 3. RELEASE EXT VERB DISPLAY SYSTEM.

R0993 KEY
 R0994 THE FOLLOWING IS A KEY TO THE 5 DIGITS OF THE DAP DATA CODE (N46)

R0995 DIGIT A - VEHICLE CONFIGURATION

R0996 1 - LM ALONE, ASCENT
 R0997 2 - LM ALONE, DESCENT
 R0998 3 - CSM AND LM DOCKED

R0999 DIGIT B - ACCELERATION CODE

R1000 1 - 2 JET TRANSLATION, RCS SYSTEM A PREFERRED
 R1001 1 - 2 JET TRANSLATION, RCS SYSTEM B PREFERRED
 R1002 2 - 4 JET TRANSLATION, RCS SYSTEM A PREFERRED (NOT MEANINGFUL)
 R1003 3 - 4 JET TRANSLATION, RCS SYSTEM B PREFERRED (NOT MEANINGFUL)

R1004 DIGIT C - ACA SCALING

R1005 0 - FINE
 R1006 1 - NORMAL

R1007 DIGIT D - DEAPPANG

R1008 0 - 0.3 DEG
 R1009 1 - 1.0 DEG
 R1010 2 - 5.0 DEG
 R1011 (3 - 6.0 DEG BY DEFAULT)

R1012 DIGIT E - MANEUVER RATE

R1013 0 - 0.2 DEG/SEC
 R1014 1 - 0.5 DEG/SEC
 R1015 2 - 2.0 DEG/SEC
 R1016 3 - 10.0 DEG/SEC

1017	REF	17	LAST	291	43,3152	0 2076 1	DAPDISP	TC	TESTXACT
1018	REF	5	LAST	291	43,3153	3 5021 1		CAF	PRI07 R03
1019	REF	4	LAST	291	43,3154	0 5146 1		TC	PRIOCHNG
1020	REF	12	LAST	289	43,3155	0 4635 0		TC	POSTJLMP
1021	REF	1			43,3156	4 0004 1		CADR	DAPDATA1
1022					34,2000			BANK	34
1023	REF	1			21,2000			SETLCC	LOADDAP
1024					20,2004			BANK	
1025	REF	1						CCUNT*	33/R03
1026	REF	2	LAST	211	31,2000			SBANK=	LOWSLPER FOR SUBSEQUENT LOW ZCACF'S.
1027	REF	1			20,2004	3 2114 1	DAPDATA1	CAF	RECLSMK SET DISPLAY ACCORDING TO EAPBOOLS BITS.
1028	REF	4	LAST	220	21,2005	7 0111 1		MASK	DAPBCLS LP

L EXTENDED VERBS

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1029	REF	1		20,2006	55'340 0	TS	DAPDATR1	LM
1030	REF	6	LAST	217	20,2007	4 0106 1	CS	FLGWRD10
1031	REF	2	LAST	214	20,2010	7 4737 1	MASK	APSFLEBIT
1032	REF	83	LAST	283	20,2011	10 000 0	CCS	A
1033	REF	33	LAST	289	20,2012	3 4736 1	CAF	BIT14
1034	REF	2	LAST	294	20,2013	27'340 0	ACS	DAPDATR1
1035	REF	3	LAST	294	20,2014	31'340 1	CHKDATA1	CAE
1036	REF	3	LAST	282	20,2015	7 4355 1	MASK	BIT13-14
1037				20,2016	0 0006 1		EXTEND	
1038	REF	1		20,2017	1 2034 0		BZF	FORCECNE
1039	REF	4	LAST	294	20,2020	31'340 1	CAE	DAPDATR1
1040	REF	1		20,2021	7 2113 1		MASKDATR1	MASK
1041	REF	5	LAST	294	20,2022	55'340 0	TS	DAPDATR1
1042	REF	1		20,2023	3 2112 1		CAF	V01N46
1043	REF	52	LAST	291	20,2024	0 4616 1	TC	BANKCALL
1044	REF	1		20,2025	2'353 0		CAER	GCXDSPER
1045	REF	18	LAST	292	20,2026	1 5472 1	TCF	ENDEXT
1046	REF	1		20,2027	1 2037 0		TCF	DPDAT1
1047	REF	1		20,2030	1 2014 1		TCF	CHKDATA1
1048	REF	1		20,2031	3 6245 1		CAF	REVCNT
1049	REF	3	LAST	278	20,2032	0 5464 1	TC	BLANKET
1050	REF	16	LAST	291	20,2033	1 5155 1	TCF	FNDOFJCB
1051	REF	22	LAST	258	20,2034	3 4737 0	FORCECNE	CAF
1052	REF	6	LAST	294	20,2035	27'340 0	ACS	DAPDATR1
1053	REF	1		20,2036	1 2021 1		TCF	MASKDATR1
1054				20,2037	0 0004 0		DPDAT1	INHINT
1055	REF	3	LAST	294	20,2040	4 4737 1	CS	APSFLEBIT
1056	REF	7	LAST	294	20,2041	7 0106 1	MASK	FLGWRD10
1057	REF	22	LAST	276	20,2042	54 001 1	TS	L
1058	REF	7	LAST	294	20,2043	4 1340 0	CS	DAPDATR1
1059	REF	34	LAST	294	20,2044	7 4736 0	MASK	BIT14
1060	REF	94	LAST	294	20,2045	10 000 0	CCS	A
1061	REF	4	LAST	294	20,2046	3 4737 0	CAF	APSFLEBIT
1062	REF	23	LAST	294	20,2047	6 0001 0	AD	L
1063	REF	8	LAST	294	20,2050	54 106 1	TS	FLGWRD10
1064	REF	8	LAST	294	20,2051	4 1340 0	CS	DAPDATR1
1065	REF	14	LAST	294	20,2052	7 4355 1	MASK	BIT13-14
1066	REF	85	LAST	294	20,2053	10 000 0	CCS	A
1067	REF	1		20,2054	4 4737 1		CS	CSMDCKCK
1068	REF	2	LAST	293	20,2055	6 2114 1	AD	BOOLSMASK
1069	REF	9	LAST	294	20,2056	7 1340 0	MASK	DAPDATR1
1070	REF	24	LAST	294	20,2057	54 001 1	TS	L
1071	REF	3	LAST	294	20,2060	4 2114 0	CS	BOOLSMASK
1072	REF	5	LAST	293	20,2061	7 0111 1	MASK	DAPBCCLS
1073	REF	25	LAST	294	20,2062	6 0011 0	AD	L
1074	REF	6	LAST	294	20,2063	54 111 1	TS	DAPBCCLS
1075	REF	2	LAST	294	20,2064	7 4737 1	MASK	CSMDCKCK
1076	REF	86	LAST	294	20,2065	10 000 0	CCS	A
1077	REF	1		20,2066	31'327 0		CAE	CSMMASS

IF BITS 13 AND 14 ARE BOTH ZERO, FORCE A ONE INTO BIT 13.

ENSURE THAT NO ILLEGAL BITS SET BY CREW.

LM

V34E TERMINATE
V33E FRCEEC

F NEW DATA CHECK AND REDISPLAY
BITS 2 & 3: BLANKS R2 & R3.

INHINT FOR SETTING OF FLAG BITS AND MASS ON BASIS OF DISPLAYED DAPDATR1.

SET APSFLAG TO BE COMPLEMENT OF BIT 14.

SET BITS OF DAPBCCLS ON BASIS OF DISPLAY MASK CLT CSMDCCKD (BIT 13) UNLESS BOTH 13 AND 14 ARE SET.

LOAD MASS IN ACCORDANCE WITH CSMDCCKD. MASS IS USUALLY ALREADY OKAY, SO DO NOT TOUCH ITS LOW-ORDER PART.

L EXTENDED VERBS

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1078	REF	7	LAST	215	21,2167	6 1326 1	AD	LEMMASS		
1079	REF	3	LAST	105	21,2170	55'243 1	TS	MASS		
1081	REF	7	LAST	294	21,2171	21 111 0	CAE	DAPBCCLS		
1081	REF	1			21,2172	7 4741 0	MASK	ACC4CR2X	2 PR 4 JET X-TRANSLATION	
1082					21,2173	0 0006 1	EXTEND		(BIT ACC4CR2X = 1 FOR 4 JETS)	
1083					21,2174	1 2101 1	BZF	+5		
1084	REF	20	LAST	218	21,2175	4 4735 0	CS	PIT15		
1085	REF	11	LAST	288	21,2176	7 0175 1	MASK	FLAGWRD1	CLEAR NJTSFLAG TO 0 FOR 4 JETS	
1086	REF	12	LAST	295	21,2177	54 075 1	TS	FLAGWRD1		
1087					21,2178	1 2104 1	TCF	+4		
1088	REF	13	LAST	295	21,2101	4 0075 1	CS	FLAGWRD1	SET NJTSFLAG TO 1 FOR 2 JETS	
1089	REF	21	LAST	295	21,2102	7 4735 0	MASK	BIT15		
1090	REF	14	LAST	295	21,2103	26 075 1	ADS	FLAGWRD1		
1091	REF	8	LAST	295	21,2104	3 0111 0	CA	DAPBCCLS	SELECT DESIRED KALCNAU AUTOMATIC	
1092	REF	2	LAST	234	21,2105	7 6250 1	MASK	THREE	MANEUVER RATE	
1093					21,2106	6 0000 1	COUPLE		RATEINDX HAS TO BE 0,2,4,6 SINCE RATES	
1094	REF	2	LAST	213	21,2107	55'322 1	TS	RATEINDX	ARE DP	
1095	REF	13	LAST	293	21,2110	0 4635 0	TC	POSTJUMP		
1096	REF	1			21,2111	02211 1	CADR	STIKLOAD		
1097					21,2112	02256 1	VOIN46	VN	0146	
1098					21,2113	33133 0	DSPLYMSK	CCT	33133	
1099					21,2114	13133 1	BOOLSMK	CCT	13133	
1100					01,2211		EANK	01		
1101	REF	2	LAST	43	01,2210		STILCC	LCADCAP1		
1102					01,2211		RANK			
1103	REF	2	LAST	43 TO	43:	2	2*	COUNT#	\$1/R03	
1104	REF	3	LAST	220	01,2211	3 5015 0	STIKLOAD	CAF	EBANK6	
1105	REF	7	LAST	280	01,2212	54 003 0	TS	EBANK		
1106	REF	2	LAST	213	06,1444		EBANK=	STIKSENS		
1107	REF	1			01,2213	3 4745 0	CA	RHCSCALE	SET STICK SENSITIVITY TO CORRESPOND TO A	
1108	REF	9	LAST	295	01,2214	7 0111 1	MASK	DAPBCCLS	MAXIMUM COMMANDED RATE (AT 42 COUNTS) OF	
1109	REF	87	LAST	294	01,2215	10 000 0	CCS	A	20 D/S(NORMAL) OR 4 D/S(FINE), SCALED	
1110	REF	1			01,2216	3 2340 1	CA	NORMAL	AT 45 D/S.	
1111	REF	1			01,2217	6 2341 0	AD	FINE		
1112	REF	3	LAST	295	01,2220	55'444 0	TS	STIKSENS		
1113	REF	1			01,2221	3 2343 1	CA	-0.60 D/S		
1114	REF	3	LAST	213	01,2222	55'476 1	TS	-RATECB	LM-ONLY BREAKOUT LEVEL IS .6 D/S.	
1115	REF	3	LAST	294	01,2223	3 4737 0	CA	CSMDCCCKD	IF CSM-DOCKED, DIVIDE STICK SENSITIVITY	
1116	REF	10	LAST	295	01,2224	7 0111 1	MASK	DAPBCCLS	BY 10. NORMAL SCALING IS THEN 2 D/S AND	
1117					01,2225	0 0006 1	EXTEND		FINE SCALING IS 0.4 D/S	
1118					01,2226	1 2235 0	BZF	+7	BRANCH IF CSM IS NOT DOCKED.	
1119	REF	4	LAST	295	01,2227	3 1444 1	CA	STIKSENS		
1120					01,2230	0 0006 1	EXTEND			
1121	REF	1			01,2231	7 2342 1	MP	1/10		
1122	REF	5	LAST	295	01,2232	55'444 0	TS	STIKSENS		
1123	REF	1			01,2233	3 2344 0	CA	-0.30 D/S	CSM-DOCKED BREAKOUT LEVEL IS .3 D/S.	
1124	REF	4	LAST	295	01,2234	55'476 1	TS	-RATECB		

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1125					01,2235	0 0003 1		RELINT		PROCEED TO ACUN 47, MASS LOAD,
1126	REF	1			01,2236	3 2336 0	DAPDATA2	CAF	V0647	
1127	REF	53	LAST	294	01,2237	0 4616 1		TC	BANKCALL	
1128	REF	2	LAST	294	01,2240	20353 0		CADR	GCXDSPFR	
1129	REF	1			01,2241	1 2247 0		TCF	ENDR03	V34E TERMINATE. FIRST SET DB, DO 1/ACCS
1130	REF	1			01,2242	1 2253 0		TCF	DAPDATA2	V33E PROCEED
1131	REF	1			01,2243	1 2236 0		TCF	DAPDATA2	LOAD NEW DATA AND RECYCLE
1132	REF	17	LAST	278	01,2244	3 4751 0		CAF	BIT3	BLANKS R3
1133	REF	4	LAST	294	01,2245	0 5464 1		TC	BLANKET	LM
1134	REF	17	LAST	294	01,2246	1 5155 1		TCF	ENDOFJOB	
1135					01,2247	0 0004 0	ENDR03	INHINT		
1136	REF	14	LAST	289	01,2250	0 4674 0		TC	IBNKCALL	
1137	REF	2	LAST	289	01,2251	40115 0		CADR	RESTORCB	
1138	REF	19	LAST	294	01,2252	1 5472 1		TCF	ENDEXT	CCES RELINT
1139	REF	9	LAST	294	01,2253	4 0106 1	DAPDATA2	CS	FLGWRD10	DETERMINE STAGE FROM APSFLAG
1140	REF	5	LAST	294	01,2254	7 4737 1		MASK	AFSFLBIT	
1141	REF	38	LAST	295	01,2255	10 0006 0		CCS	A	
1142	REF	1			01,2256	3 2000 0		CA	MINLMF	
1143	REF	1			01,2257	6 2001 1		AD	MINMINLM	
1144	REF	8	LAST	295	01,2260	6 1326 1		AD	LEMMASS	LEMMASS MUST BE GREATER THAN EMPTY LEM
1145					01,2261	0 0006 1		EXTEND		
1146	REF	2	LAST	296	01,2262	6 2236 1		BZMF	DAPDATA2	ASK FOR NEW MASSES
1147	REF	11	LAST	295	01,2263	30 111 0		CAE	DAPBOOLS	
1148	REF	4	LAST	295	01,2264	7 4737 1		MASK	CSMDOCKC	
1149					01,2265	1 0006 1		EXTEND		
1150	REF	1			01,2266	1 2274 0		BZF	LEMAICNE	SKIP TEST ON CSMMASS IF NOT DOCKED.
1151	REF	1			01,2267	4 4741 0		CS	MINCSM	TEST CSM MASS
1152	REF	2	LAST	294	01,2270	6 1327 0		AD	CSMMASS	CSMMASS MUST BE GREATER THAN EMPTY CSM
1153					01,2271	0 0006 1		EXTEND		
1154	REF	3	LAST	296	01,2272	6 2236 1		BZMF	DAPDATA2	ASK FOR NEW MASSES
1155	REF	3	LAST	296	01,2273	31 1327 0		CAE	CSMMASS	DOCKED: MASS = CSMMASS + LEMMASS
1156	REF	9	LAST	296	01,2274	6 1326 1	LEMAICNE	AD	LEMMASS	LEM ALCNE: MASS = LEMMASS
1157					01,2275	22 0007 0		ZL		
1158	REF	4	LAST	295	01,2276	53 1244 0		EXCH	MASS	
1159					01,2277	0 0004 0		INHINT		
1160	REF	15	LAST	296	01,2300	0 4674 0		TC	IBNKCALL	SET DECEBANK AND COMPUTE MOMENTS OF
1161	REF	3	LAST	296	01,2301	40115 0		CADR	RESTORCB	INERTIA.
1162					01,2302	0 0003 1		RELINT		PROCEED TO ACUN 48 (OR END).
1163	REF	10	LAST	296	01,2303	4 0106 1	DAPDATA3	CS	FLGWRD10	
1164	REF	6	LAST	296	01,2304	7 4737 1		MASK	AFSFLBIT	
1165					01,2305	1 0006 1		EXTEND		END ROUTINE IF LEM HAS STAGED,
1166	REF	20	LAST	296	01,2306	1 5472 1		BZF	ENDEXT	
1167	REF	1			01,2307	3 2337 1		CAF	V06N48	DISPLAY TRIM ANGLES AND REQUEST RESPONSE
1168	REF	54	LAST	296	01,2310	0 4616 1		TC	BANKCALL	
1169	REF	3	LAST	296	01,2311	20353 0		CADR	GCXDSPFR	
1170	REF	21	LAST	296	01,2312	0 5472 0		TC	ENDEXT	
1171	REF	1			01,2313	1 2320 0		TCF	DPDATA3	V33E GC DO TRIM (WAITLIST TC TRIMING)

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1172					01,2314	1 2307 0		TCF	-5	LOAD NEW DATA AND RECYCLE
1173	REF	18	LAST	296	01,2315	3 4751 1		CAF	BIT2	
1174	REF	5	LAST	296	01,2316	0 5464 1		TC	BLANKET	BLANK R2
1175	REF	18	LAST	296	01,2317	1 5155 1		TCF	ENDOFJOB	
1176	REF	18	LAST	182	01,2320	3 4753 1	OPCAT3	CAF	BIT1	
1177	REF	11	LAST	284	01,2321	0 5203 0		TC	WAITLIST	
1178	REF	1			06,1401			ERANK=	PCILTIME	
1179	REF	1			01,2322	0 3217 0		ZCAER	TRIMCMB	
1179	REF	1			01,2323	56066 1				
1180	REF	19	LAST	297	01,2324	1 5155 1		TCF	ENDOFJOB	DCES A RELINT
1181	REF	1			01,2325	3 2337 1	TRIMCONE	CAF	V50N48	
1182	REF	55	LAST	296	01,2326	0 4616 1		TC	BANKCALL	TRIM IS FINISHED; PLEASE TERMINATE R03
1183	REF	2	LAST	272	01,2327	23361 1		CADR	GOMARK3R -1	
1184	REF	22	LAST	296	01,2330	0 5472 0		TC	ENDEXT	V34E TERMINATE
1185	REF	23	LAST	297	01,2331	0 5472 0		TC	ENDEXT	
1186	REF	24	LAST	297	01,2332	0 5472 0		TC	ENDEXT	
1187	REF	3	LAST	267	01,2333	3 6017 0		CAF	OCT24	BIT5 TC CHANGE TC PERFORM, 3 TO BLANK R2
1188	REF	6	LAST	297	01,2334	0 5464 1		TC	BLANKET	
1189	REF	20	LAST	297	01,2335	1 5155 1		TCF	ENDOFJOB	
1190					01,2336	01457 0	V0647	VN	0647	
1191					01,2337	01460 1	V06N48	VN	0648	
1192	REF	2	LAST	296	01,2337		V50N48	=	V06N48	
1193					01,2340	25101 0	NORMAL	DFC	.660214	
A1194										NORMAL SCALING IS 20 P/S
1195					01,2341	05220 1	FINE	DEC	.165054	FINE STICK SCALING (4 E/S).
1196					01,2342	03146 1	1/1)	DEC	.1	FACTOR FOR CSW-CHECKED SCALING
1197					01,2343	77445 1	-0.6E/S	DEC	-218	
1198					01,2344	77622 1	-0.3E/S	DEC	-109	

L EXTENDED VERBS

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P1199 VERB 66. VEHICLES ARE ATTACHED. MOVE THIS VEHICLE STATE VECTOR TO
R1200 OTHER VEHICLE STATE VECTOR.

R1201 USE SUBROUTINE GENTRAN.

1202 17,2667 BANK 7
1203 REF 6 LAST 289 43,2100 SETLOC EXTVERBS
1204 43,2157 BANK

1205 REF 6 LAST 289 TO 293: 61 445* COUNT* \$1/EXTVB

1206 REF 1 53,1626 EBANK= RPECTHIS

1207 REF 2 LAST 258 43,2167 4 2104 0 ATTACHED CS FLAGWRD8
1208 REF 2 LAST 214 43,2160 7 4744 0 MASK SURFFBIT
1209 43,2161 0 0006 1 EXTEND
1210 REF 23 LAST 282 43,2162 1 2114 0 BZF ALM/END TURN ON CF AND EXIT IF SURFFLAG SET.
1211 REF 3 LAST 287 43,2163 3 4737 0 CAF PRIC1
1212 REF 10 LAST 291 43,2164 0 5105 0 TC FINDVAC
1213 REF 2 LAST 298 53,1626 EBANK= RPECTHIS

1214 REF 1 43,2165 03170 1 2CADR ATTACHIT

1214 REF 1 43,2166 66103 0

1215 REF 21 LAST 297 43,2167 0 5155 0 TC ENDOFJOB

1216 REF 7 LAST 288 43,2170 0 6042 1 ATTACHIT TC INTERPRET

1217 43,2171 77624 1 CALL

1218 REF 4 LAST 288 43,2172 27412 0 INTSTALL

1219 43,2173 43014 0 SET BDN

1220 REF 1 43,2174 04063 0 MCCNCTH

1221 REF 1 43,2175 04304 1 MCCNTHIS

1222 43,2176 67201 0 +3

1223 43,2177 77614 1 CLEAR

1224 REF 2 LAST 295 43,2200 04263 1 MCCNCTH

1225 43,2201 77776 1 EXIT

1226 REF 1 43,2202 3 3225 1 CAF OCT51

1227 REF 1 43,2203 0 5544 1 TC GENTRAN

1228 REF 3 LAST 298 43,2204 01626 1 ADRES PRECTHIS

1229 REF 1 43,2205 01554 1 ADRES RPECTCTH

CLR STATE VECTOR INTO OTHER VIA GENTRAN

1230 43,2206 0 0003 1 RELINT

1231 REF 8 LAST 298 43,2207 0 6042 1 TC INTERPRET

1232 43,2210 77624 1 CALL

1233 REF 1 43,2211 26761 0 PTCALCM

1234 43,2212 45154 0 LXA,2 CALL

1235 REF 3 LAST 120 43,2213 02030 0 PECOY

1236 REF 1 43,2214 26114 1 SVDWN1

1237 43,2215 77776 1 EXIT

1238 REF 1 43,2216 3 3226 1 CAF TCPINAD

UPDATE R-OTHER, V-OTHER

L EXTENDED VERBS

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1239	REF	8	LAST	252	43,3217	50 120 1	INDEX	FIXLCP		
1240	REF	1			43,3221	54 52 1	IS	QPRFT		
1241	REF	14	LAST	295	43,3221	0 4635 0	TC	POSTJUMP		
1242	REF	1			43,3222	27422 1	CADR	INTWAKE	FREE INTEGRATION AND EXIT.	
1243					43,3222	77634 1	TCPIN	RTR		
1244	REF	3	LAST	264	43,3224	21051 0		PINBRNCH		
1245					43,3225	00051 0	OUT51	ECT	51	
1246	REF	1			43,3226	67223 0	TCPINAD	CADR	TCPIN	
R1247	VERB	56							SET QUITFLAG TO STOP INTEGRATION.	
R1248									GO TO V37 WITH ZERO TO CAUSE POO.	
R1249									STATEMENT WILL CHECK QUITFLAG AND SKIP 1ST PASS,	
R1250									THUS ALLOWING A 10 MINUTE PERIOD WITHOUT INTEGRATION.	
1251	REF	12	LAST	290	43,3227	0 5504 1	VERB96	TC	UPFLAG	QUITFLAG WILL CAUSE INTEGRATION TO EXIT
1252	REF	1			43,3230	00221 0		ADRES	QUITFLAG	AT NEXT TIMESTEP
1253	REF	31	LAST	280	43,3231	3 4755 1		CAF	ZERO	
1254	REF	15	LAST	299	43,3232	0 4635 0		TC	POSTJUMP	
1255	REF	1			43,3233	10040 1		CADR	V37	GO TO FCC
R1256										
R1257	VERB	67								DISPLAY OF W MATRIX
1258	REF	18	LAST	293	43,3234	0 2076 1	V67	TC	TESTXACT	
1259	REF	2	LAST	230	43,3235	3 5017 1		CAF	PRIC5	
1260	REF	11	LAST	298	43,3236	0 5105 0		TC	FINDVAC	
1261	REF	1			44,1600			FRANK=	WWFCS	
1262	REF	1			43,3237	02007 1		ZCADR	V67CALL	
1262	REF	1			43,3240	62064 1				
1263	REF	22	LAST	298	43,3241	0 5155 0		TC	ENDCFJCR	
R1264	VERB	65								DISABLE U,V JETS DURING DPS BURNS
1265	REF	13	LAST	299	43,3242	0 5504 0	SALFFCLT	TC	UPFLAG	
1266	REF	1			43,3243	00115 1		ADRES	SNUFFER	
1267	REF	21	LAST	291	43,3244	0 2115 0		TC	GCPIA	
R1268	VERB	75								ENABLE U,V JETS DURING DPS BURNS
1269	REF	29	LAST	290	43,3245	0 5516 0	OUTSNUFF	TC	DOWNFLAG	
1270	REF	2	LAST	295	43,3246	00115 1		ADRES	SNUFFER	
1271	REF	22	LAST	299	43,3247	0 2115 0		TC	GCPIA	
R1272	VERB	85								DISPLAY OF LCS AZIMUTH AND ELEVATION.
R1273										AZIMUTH IS THE ANGLE BETWEEN THE LCS AND THE X-Z AB PLANE, 0 - 90 DEG IN THE +Y HEMISPHERE,
R1275										360 - 270 DEG IN THE -Y HEMISPHERE.

L EXTENDED VERBS

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R1276 ELEVATION IS THE ANGLE BETWEEN +ZNR AND THE PROJECTION OF THE LCS INTO THE X-Z PLANE, C - 360 ABOUT +Y.

1278	REF	2	LAST	119	E4,1600		EBANK= RR-AZ
1279	REF	19	LAST	299	43,3250	0 2076 1	TC TESTXACT
1280	REF	16	LAST	299	43,3251	0 4635 0	TC PCSTJUMP
1281	REF	1			43,3252	60000 1	CADR DSPRRLOS

1282	REF	1			40,2000		SETLCC PINBALL
1283					40,2000		BANK

1284	REF	1					CCUNT* \$1/EXTVE
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1285	REF	3	LAST	299	40,2000	3 5017 1	DSPRRLOS CAF PRIOS
1286	REF	12	LAST	299	40,2001	0 5105 0	TC FINDVAC
1287	REF	3	LAST	300	E4,1600		EBANK= RR-AZ
1288	REF	1			40,2002	0 2017 0	2CADR RRLCSDSP
1288	REF	1			40,2003	60104 1	
1289	REF	3	LAST	281	40,2004	3 4740 0	CAF PRIC4
1290	REF	5	LAST	293	40,2005	0 5146 1	TC PRIOCHNG
1291	REF	1			40,2006	3 2076 1	CAF V16N56
1292	REF	56	LAST	297	40,2007	0 4616 1	TC BANKCALL
1293	REF	4	LAST	278	40,2010	20353 0	CADR GOMARKER
1294	REF	4	LAST	272	40,2011	0 5563 1	TC B5OFF
1295	REF	5	LAST	300	40,2012	0 5563 1	TC B5OFF
1296	REF	6	LAST	300	40,2013	0 5563 1	TC B5OFF
1297	REF	19	LAST	297	40,2014	3 4751 0	CAF BIT3
1298	REF	7	LAST	297	40,2015	0 5464 1	TC BLANKET
1299	REF	23	LAST	299	40,2016	0 5155 0	TC ENDCFJCP

1300					40,2017	0 0006 1	RRLCSDSP EXTEND	
1301	REF	2	LAST	188	40,2020	3 0036 1	DCA CDUT	
1302	REF	42	LAST	291	40,2021	52 155 1	DXCH MPAC	
1303	REF	9	LAST	298	40,2022	0 6042 1	TC INTPRET	
1304					40,2023	77624 1	CALL	
1305	REF	1			40,2024	46065 0	RRABMPAC	GET RR LCS IN BODY AXIS.
1306					40,2025	00001 0	STORE JD	UNIT LCS
1307					40,2026	14007 0	STCOL 6D	
1308	REF	1			40,2027	06524 1	H16ZEROS	
1309					40,2030	24011 1	STCVL 8D	
1310					40,2031	00007 0	6D	
1311					40,2032	77656 1	UNIT	
1312					40,2033	00007 0	STCPE 6D	UNIT OF LOS PROJ IN X-Z PLANE
1313					40,2034	77641 1	DCT	
1314	REF	3	LAST	37	40,2035	06516 0	UNITZ	
1315	REF	1			40,2036	24021 1	STCVL CCSTF	16D
1316	REF	3	LAST	37	40,2037	06522 1	UNITX	
1317					40,2040	77641 1	DCT	
1318					40,2041	00007 0	6D	
1319	REF	1			40,2042	34023 1	STCALL SINTH	18D

L EXTENDED VERBS

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1320	REF	1		40,2042	47322 1		ARCTRIG	
1321				40,2044	43244 1	BPL	DAD	INSURE DISPLAY OF C - 360 DEG.
1322				40,2045	60247 1		+2	
1323	REF	1		40,2046	06532 0		DEPCSNAX	INTRODUCES AN ERROR OF E-28 REVS.
1324	REF	1		40,2047	26203 1	STOVL	RR-ELEV	
1325				40,2050	00001 0		00	
1326				40,2051	77641 1	DCT		
1327	REF	2	LAST	37	40,2052	06520 0	UNITY	
1328	REF	2	LAST	300	40,2053	24022 0	STOVL	SINTH
1329				40,2054	00001 0		00	
1330				40,2055	77641 1	DCT		
1331				40,2056	00007 0		60	
1332	REF	2	LAST	300	40,2057	34021 0	STCALL	CCSTH
1333	REF	2	LAST	301	40,2060	47322 1	ARCTRIG	
1334				40,2061	42244 1	BPL	DAD	INSURE DISPLAY OF C - 360 DEG.
1335				40,2062	60064 0		+2	
1336	REF	2	LAST	301	40,2063	06532 0	DEPCSNAX	INTRODUCES AN ERROR OF E-28 REVS.
1337	REF	4	LAST	300	40,2064	02201 0	STORE	PR-AZ
1338				40,2065	77776 1	EXIT		
1339	REF	2	LAST	270	40,2066	3 4777 1	CA	1 SEC
1340	REF	57	LAST	300	40,2067	0 4616 1	TC	BANKCALL
1341	REF	6	LAST	280	40,2070	01736 1	CAER	DELAYJOB
1342	REF	18	LAST	272	40,2071	3 4747 1	CA	BIT5
1343	REF	8	LAST	272	40,2072	7 1043 0	MASK	EXTVEACT
1344	REF	85	LAST	296	40,2073	10 000 0	CCS	A
1345	REF	2	LAST	300	40,2074	0 2017 0	TC	RRLOSDSP
1346	REF	25	LAST	297	40,2075	0 5472 0	TC	ENDEXT
1347				40,2076	04070 1	V16N56	VA	1056

L PIRALL NCLN TABLES

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P1000 THE FOLLOWING REFERS TO THE NCLN TABLES

R1001	COMPONENT CODE NUMBER	INTERPRETATION
R1002	0000	1 COMPONENT
R1003	0001	2 COMPONENT
R1004	0010	3 COMPONENT
R1005	X1XXX	BIT4 = 1. DECIMAL ONLY
R1006	1XXXX	BIT5 = 1. NO LOAD
R1007	END OF COMPONENT CODE NUMBERS	

R1008	SF ROUTINE CODE NUMBER	INTERPRETATION
R1009	0000	OCTAL ONLY
R1010	0001	STRAIGHT FRACTIONAL
R1011	0010	CDU DEGREES (XXX.XX)
R1012	0011	ARITHMETIC SF
R1013	00100	ARITH DP1 OUT (MULT BY 2EXP14 AT END) IN (STRAIGHT)
R1014	00101	ARITH DP2 OUT (STRAIGHT) IN (SL 7 AT END)
R1015	00110	LANDING FACAP POSITION (+0000X)
R1016	01111	ARITH CP3 OUT (SL 7 AT END) IN (STRAIGHT)
R1017	01000	WHOLE HOURS IN R1, WHOLE MINUTES (MOD 60) IN R2,
R1018		SECONDS (MOD 60) CXX.XX IN R3. *** ALARMS IF USED WITH OCTAL
R1019	01001	MINUTES (MOD 60) IN D102, D3 BLANK, SECONDS (MOD 60) IN D405
R1020		LIMITS TO 59859 IF MAG EXCEEDS THIS VALUE.
R1021		ALARMS IF USED WITH OCTAL ***** IN (ALARM)
R1022	01010	ARITH DP4 OUT (STRAIGHT) IN (SL 3 AT END)
R10221	01011	ARITH1 SF OUT (MULT BY 2EXP14 AT END) IN (STRAIGHT)
R10222	01100	2 INTEGERS IN D102, D405, D3 BLANK.
R10223		ALARMS IF USED WITH OCTAL ***** IN (ALARM)
R10224	01101	360-CDU DEGREES (XXX.XX)
R10225	01110	RR RANGE 15 BIT MAG TO DP, THEN SCALE ***** IN (ALARM)
R10226	01111	RR RANGE RATE 15 BIT MAG TO CP, THEN SCALE ***** IN (ALARM)
R1023	END OF SF ROUTINE CODE NUMBERS	

R1024	SF CCANSTANT CODE NUMBER	INTERPRETATION
R1025	0000	WHOLE USE ARITH
R1026	0000	DP TIME SEC (XXX.XX SEC) USE ARITHDP1
R10265	00000	LR POSITION (+0000X) USE LR POSITION
R1027	00001	SPARE
R1028	00010	CDU DEGREES USE CDU DEGREES
R1029	00010	360-CDU DEGREES USE 360-CDU DEGREES
R1030	00011	DP DEGREES (90) XX.XXX DEG USE ARITHDP3
R1031	00100	CP DEGREES (360) XXX.XX DEG USE ARITHDP4
R1032	00101	DEGREES (180) XXX.XX DEG USE ARITH
R10321	00101	OPTICAL TRACKER AZIMUTH ANGLE (XXX.XX DEG)

1 FINBALL NCUN TABLES

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R10322			USE ARITHDR1
R1034	00110	WEIGHT2 (XXXXX. LBS)	USE ARITH1
R1035	00111	POSITION5 (XXX.XX NAUTICAL MILES)	
R10351			USE ARITHDP2
R1037	01000	POSITION4 (XXXXX.X NAUTICAL MILES)	
R10371			USE ARITHDP3
R1038	01001	VELOCITY2 (XXXXXX. FT/SEC)	USE ARITHCF4
R1039	01010	VELOCITY3 (XXXXX.X FT/SEC)	USE ARITHDP3
R1040	01011	ELEVATION DEGREES(89.999MAX)	USE ARITH
R1041	01100	RENDEZVOUS RADAR RANGE (XXX.XX NALT MI)	
R1042			USE RR RANGE
R1043	01101	RENDEZVOUS RADAR RANGE RATE (XXXXX.FT/SEC)	
R1044			USE RR RANGE RATE
R1045	01110	LANDING RADAR ALTITUDE (XXXXX.FEET)	
R1046			USE ARITHDP1
R1047	01111	INITIAL/FINAL ALTITUDE (XXXXX.FEET)	
R1048			USE ARITHDP1
R1049	10000	ALTITUDE RATE (XXXXX.FT/SEC)	USE ARITH
R1050	10001	FORWARD/LATERAL VELOCITY (XXXXX.FEET/SEC)	
R1051			USE ARITH
R1052	10010	ROTATIONAL HAND CONTROLLER ANGLE RATES	
R1053		XXXXX.DEG/SEC	USE ARITH
R1054	10011	LANDING RADAR VELX (XXXXX.FEET/SEC)	
R1055			USE ARITHDR1
R1056	10100	LANDING RADAR VFY (XXXXX.FEET/SEC)	
R1057			USE ARITHDP1
R1058	10101	LANDING RADAR VFZ (XXXXX.FEET/SEC)	
R1059			USE ARITHDP1
R1060	10110	POSITION7 (XXXXX.X NALT MI)	USE ARITHCF4
R10601	10111	TRIM DEGREES2 (XXX.XX DEG)	USE ARITH
R1061	11000	COMPUTED ALTITUDE (XXXXX. FEET)	
R106101			USE ARITHDP1
R106102	11001	DR DEGREES (XXXXX.X DEG)	USE ARITHDR3
R106103	11010	POSITION9 (XXXXX. FT)	USE ARITHDP3
R106104	11011	VELOCITY4 (XXXXX.X FT/SEC)	USE ARITHDR2
R106105	11100	RADIANS (XX.XXX RADIANS)	USE ARITHCF4
R1062	END OF SE CONSTANT CODE NUMBERS		

R1063 FOR GREATER THAN SINGLE PRECISION SCALES, PUT ADDRESS OF MAJOR PART INTO
 R1064 NCUN TABLES.
 R1065 OCTAL LEADS PLACE 40 INTO MAJOR PART, DATA INTO MINOR PART.
 R1066 OCTAL DISPLAYS SHOW MINOR PART ONLY.
 R1067 TO GET AT BOTH MAJOR AND MINOR PARTS (IN OCTAL), USE NCUN 01.

R1068 A NCUN MAY BE DECLARED :DECIMAL ONLY: BY MAKING BIT4=1 OF ITS COMPONENT
 R1069 CODE NUMBER. IF THIS NCUN IS USED WITH ANY OCTAL DISPLAY VERR, OR IF
 R1070 DATA IS LOADED IN OCTAL, IT ALARMS.

L PINBALL NOUN TABLES

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R1071 IN LOADING AN :HOURS, MINUTES, SECONDS: NOUN, ALL 3 WORDS MUST BE
R1072 LOADED, OR ALARM.
R1073 ALARM IF AN ATTEMPT IS MADE TO LOAD :SPLIT MINUTES/SECONDS: (MMSSS).
R1074 THIS IS USED FOR DISPLAY ONLY.

L FINBALL NOUN TABLES

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R1075 THE FOLLOWING ROUTINES ARE FOR READING THE NOUN TABLES AND THE SF TABLES
 R1076 (WHICH ARE IN A SEPARATE BANK FROM THE REST OF FINBALL). THESE READING
 R1077 ROUTINES ARE IN THE SAME BANK AS THE TABLES. THEY ARE CALLED BY DXCH Z.

R1078 LCONNTAB LOADS NNADTEM WITH THE NNADTAB ENTRY, NNTYPTTEM WITH THE
 R1079 NNTYPTTAB ENTRY. IF THE NOUN IS MIXED, IDADITEM IS LOADED WITH THE FIRST
 R1080 IDADCTAB ENTRY, ICAC2TEM THE SECOND ICACCTAB ENTRY, ICAC3TEM THE THIRD
 R1081 IDADCTAB ENTRY, PUTXITEM WITH THE PUTXTAB ENTRY. MIXER IS SET FOR
 R1082 MIXED OR NORMAL NOUN.

1200					06,3271		BANK	6	
12002	REF	2	LAST	282	42,2100		SETLCC	FINBALL3	
12003					42,2102		BANK		
12005	REF	1					COUNT#	49/NOUMS	
1201	REF	1			42,2103	52 152 0	LCONNTAB	DXCH	IDAD2TEM
1202	REF	3	LAST	267	42,2104	51'001 1	INDEX	NOUNREG	SAVE RETURN INFO IN ICAC2TEM, ICAC3TEM.
1203	REF	1			42,2105	3 2154 0	CAF	NNADTAB	
1204	REF	1			42,2106	54 146 0	TS	NNADTEM	
1205	REF	4	LAST	305	42,2107	51'001 1	INDEX	NOUNREG	
1206	REF	1			42,2109	3 2320 1	CAF	NNTYPTTAB	
1207	REF	1			42,2111	54 147 1	TS	NNTYPTTEM	
1208	REF	5	LAST	305	42,2112	4 1001 0	CS	NOUNREG	
1209	REF	1			42,2113	6 4771 1	AD	MIXCON	
1210					42,2114	0 0006 1	EXTEND		
1211	REF	1			42,2115	6 2121 1	EZMF	LCDMIXNN	NOUN NUMBER G/E FIRST MIXED NOUN
1212	REF	14	LAST	279	42,2116	3 4753 1	CAF	ONE	NOUN NUMBER L/ FIRST MIXED NOUN
1213	REF	1			42,2117	54 140 0	TS	MIXBR	NORMAL. +1 INTO MIXBR.
1214	REF	1			42,2120	0 2137 0	TC	LCONLV	
1215	REF	11	LAST	283	42,2121	3 4752 0	LCDMIXNN	CAF	TWO
1216	REF	2	LAST	305	42,2122	54 140 0	TS	MIXBR	MIXED. +2 INTO MIXBR.
1217	REF	6	LAST	305	42,2123	51'001 1	INDEX	NOUNREG	
1218	REF	1			42,2124	3 2264 0	CAF	PUTXTAB	-40 FIRST MIXED NOUN = 40.
1219	REF	1			42,2125	54 153 1	TS	PUTXTTEM	
1220	REF	2	LAST	233	42,2126	3 5012 1	CAF	LCW10	
1221	REF	2	LAST	305	42,2127	7 0146 0	MASK	NNADTEM	
1222	REF	28	LAST	283	42,2130	54 002 1	TS	Q	TEMP
1223	REF	90	LAST	301	42,2131	50 000 1	INDEX	A	
1224	REF	1			42,2132	3 2650 0	CAF	IDADDTAB	
1225	REF	1			42,2133	54 150 1	TS	ICADITEM	LOAD ICADITEM WITH FIRST ICADCTAB ENTRY
1226					42,2134	0 0006 1	EXTEND		
1227	REF	25	LAST	305	42,2135	5 0002 0	INDEX	Q	LOAD ICAC2TEM WITH 2ND ICADCTAB ENTRY
1228	REF	2	LAST	305	42,2136	3 2652 1	CAF	IDADDTAB +1	LOAD ICAC3TEM WITH 3RD ICADCTAB ENTRY.
1229	REF	2	LAST	305	42,2137	52 152 0	LCONLV	DXCH	PUT RETURN INFO INTO A, L.
1230	REF	1			42,2140	52 006 0	DXCH	Z	
1231	REF	1			4771		MIXCON	=	OCT50 (DEC 40)
R1232									
1233	REF	1			42,2141	52 124 1	GTSFOUT	DXCH	SFTEMP1 2X(SFCCNUM) ARRIVES IN SFTEMP1.

L PINBALL ACUA TABLES

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1234					42,2142	0 0006	1	EXTEND	
1235	REF	91	LAST	205	42,2143	5 0000	1	INDEX	A
1236	REF	1			42,2144	3 2557	1	CCA	SFOUTAB
1237	REF	2	LAST	305	42,2145	52 124	1	SFCCM	EXCH SFTEMP1
1238	REF	2	LAST	305	42,2146	52 006	0	EXCH	Z

R1239 GTSFIN LOADS SFTEMP1, SFTEMP2 WITH THE DP SFINTAB ENTRIES.

1240	REF	3	LAST	306	42,2147	52 124	1	GTSFIN	EXCH SFTEMP1	2X(SFCCNUM) ARRIVES IN SFTEMP1.
1241					42,2150	0 0006	1	EXTEND		
1242	REF	92	LAST	306	42,2151	5 0000	1	INDEX	A	
1243	REF	1			42,2152	3 2465	1	CCA	SFINTAB	
1244	REF	1			42,2153	1 2145	1	TCF	SFCCM	

A1400								NA	NORMAL ACUNS	
1401					42,2154	0 0000	1	NNADTAB	OCT	00000
1402					42,2155	40000	0	OCT	40000	01 SPECIFY MACHINE ADDRESS (FPACTICNAL)
1403					42,2156	40000	0	OCT	40000	02 SPECIFY MACHINE ADDRESS (WHOLE)
1404					42,2157	40000	0	OCT	40000	03 SPECIFY MACHINE ADDRESS (CECFRES)
1405	REF	3	LAST	278	42,2160	01044	0	ECADR	DSPTM1	04 ANGULAR ERROR/DIFFERENCE
1406	REF	4	LAST	306	42,2161	01044	0	ECADR	DSPTM1	05 ANGULAR ERROR/DIFFERENCE
1407	REF	1			42,2162	01143	0	ECADR	OPTION1	06 OPTION CODE
1408	REF	1			42,2163	01002	1	ECADR	XPRG	07 ECADR OF WORD TO BE MODIFIED
A14081										CNES FOR BITS TO BE MODIFIED
A14082										1 TO SET OR 0 TO RESET SELECTED BITS
1409	REF	2	LAST	108	42,2164	01363	0	ECADR	ALMCADR	08 ALARM DATA
1410	REF	4	LAST	212	42,2165	00375	0	ECADR	FAILREG	09 ALARM CODES
1411					42,2166	77776	1	OCT	77776	10 CHANNEL TO BE SPECIFIED
1412	REF	3	LAST	199	42,2167	03633	1	ECADR	TCSI	11 TIC OF CSI (HRS,MIN,SEC)
1413	REF	7	LAST	278	42,2170	01050	0	ECADR	OPTIONX	12 OPTION CODE
A14131										(USED BY EXTENDED VERBS ONLY)
1414	REF	3	LAST	199	42,2171	01776	0	ECADR	TCDH	13 TIC OF CCF (HRS,MIN,SEC)
1415	REF	4	LAST	208	42,2172	01050	0	ECADR	DSPTM1	14 CHECKLIST
A14151										(USED BY EXTENDED VERBS ONLY)
1416					42,2173	77777	0	OCT	77777	15 INCREMENT MACHINE ADDRESS
1417	REF	5	LAST	306	42,2174	01050	0	ECADR	DSPTM1	16 TIME OF EVENT (HRS,MIN,SEC)
1418					42,2175	00000	1	OCT	00000	17 SPARE
1419	REF	1			42,2176	02344	0	ECADR	FDAIX	18 AUTO MANEUVER BALL ANGLES
1420					42,2177	00000	1	OCT	00000	19 SPARE
1421	REF	6	LAST	254	42,2200	00032	0	ECADR	CDLX	20 ICU ANGLES
1422	REF	1			42,2201	00037	0	ECADR	PIPAX	21 PIPAS
1423	REF	6	LAST	283	42,2202	00321	1	ECADR	THETAD	22 NEW ICU ANGLES
1424					42,2203	00000	1	OCT	00000	23 SPARE
1425	REF	3	LAST	276	42,2204	01050	0	ECADR	DSPTM2 +1	24 DELTA TIME FOR AGC CLOCK(HRS,MIN,SEC)
1426	REF	5	LAST	306	42,2205	01044	0	ECADR	DSPTM1	25 CHECKLIST
A14261										(USED WITH PLEASE PERFCCM ONLY)
1427	REF	6	LAST	306	42,2206	01044	0	ECADR	DSPTM1	26 PRIC/DELAY, ADRES, BBCCN
1428	REF	4	LAST	291	42,2207	01362	1	ECADR	SMODE	27 SELF TEST ON/OFF SWITCH

L PINBALL NCUN TABLES

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1429		42,2210	00000 1	CCT	00000	28 SPARE
1430		42,2211	00000 1	CCT	00000	29 SPARE
1431		42,2212	00000 1	CCT	0	30 SPARE
1432		42,2213	00000 1	CCT	0	31 SPARE
1433	REF 1	42,2214	02142 1	ECADR	-TPFF	32 TIME TO PERIGEE (HRS,MIN,SEC)
1434	REF 7 LAST 243	42,2215	03141 0	ECADR	TIG	33 TIME OF IGNITION (HRS,MIN,SEC)
1435	REF 7 LAST 306	42,2216	01144 0	ECADR	DSPTFM1	34 TIME OF EVENT (HRS,MIN,SEC)
1436	REF 9 LAST 241	42,2217	03453 0	ECADR	TTOGO	35 TIME TO GO TO EVENT (HRS,MIN,SEC)
1437	REF 10 LAST 276	42,2220	00024 1	ECADR	TIME2	36 TIME OF AGC CLOCK (HRS,MIN,SEC)
1439	REF 3 LAST 199	42,2221	03635 1	ECADR	TTPI	37 TIG OF TP1 (HRS,MIN,SEC)
1439	REF 2 LAST 111	42,2222	01516 1	ECADR	TET	38 TIME OF STATE BEING INTEGRATED
1440		42,2223	00000 1	CCT	00000	39 SPARE

P14401 END OF MAPTAP FOR NORMAL NCUNS

A14402						NN MIXED NCUNS
1441		42,2224	64000 0	CCT	64000	40 TIME TO IGNITION/CUTOFF
A14411						VG
A14412						DELTA V (ACCUMULATED)
1442		42,2225	02003 0	CCT	02003	41 TARGET AZIMUTH
A14421						ELEVATION
1443		42,2226	24006 1	CCT	24006	42 APCGEE
A14431						PERIGEE
A14432						DELTA V (REQUIRED)
1444		42,2227	24011 1	CCT	24011	43 LATITUDE
A14441						LONGITUDE
A14442						ALTITUDE
1445		42,2230	64014 0	CCT	64014	44 APCGEE
A14451						PERIGEE
A14452						TFF
1446		42,2231	64017 0	CCT	64017	45 MARKS
A14461						TTI OF NEXT PURN
A14462						YGA
1447		42,2232	00022 1	CCT	00022	46 AUTOFILCT CONFIGURATION
1448		42,2233	22025 0	CCT	22025	47 LEM WEIGHT
A14481						CSM WEIGHT
1449		42,2234	22030 1	CCT	22030	48 GIMBAL PITCH TRIM
A14491						GIMBAL ROLL TRIM
1450		42,2235	24033 1	CCT	24033	49 DELTA R
A14501						DELTA V
A14502						RADAR DATA SOURCE CODE
1451		42,2236	00000 1	CCT	0	50 SPARE
1452		42,2237	22041 1	CCT	22041	51 S-BAND ANTENNA PITCH
A14521						YAW
1453		42,2240	00044 1	CCT	00044	52 CENTRAL ANGLE OF ACTIVE VEHICLE
1454		42,2241	00000 1	CCT	00000	53 SPARE
1455		42,2242	24052 0	CCT	24052	54 RANGE
A14551						RANGE RATE
A14552						THETA
1458		42,2243	24055 1	CCT	24055	55 NO. OF APSICAL CROSSINGS

L PINBALL ACUN TABLES

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A14581						ELEVATION ANGLE
A14582						CENTRAL ANGLE
1459	42,2244	02060 0	OCT	02060	56	RR LCS AZIMUTH
A14591						ELEVATION
1460	42,2245	00000 1	OCT	00000	57	SPARE
1461	42,2246	24066 1	OCT	24066	58	PERIGEE ALT
A14611						DELTA V TPI
A14612						DELTA V TPF
1462	42,2247	24071 1	OCT	24071	59	DELTA VELOCITY LGS
1463	42,2250	24074 1	OCT	24074	60	HORIZONTAL VELOCITY
A14631						ALTITUDE RATE
A14632						COMPUTED ALTITUDE
1464	42,2251	64077 0	OCT	64077	61	TIME TO GO IN BRAKING PHASE
A14641						TIME TO IGNITION
A14642						CROSS RANGE DISTANCE
1465	42,2252	64102 0	OCT	64102	62	ABSOLUTE VALUE OF VELOCITY
A14651						TIME TO IGNITION
A14652						DELTA V (ACCUMULATED)
1466	42,2253	24105 0	OCT	24105	63	ABSOLUTE VALUE OF VELOCITY
A14661						ALTITUDE RATE
A14662						COMPUTED ALTITUDE
1467	42,2254	64110 0	OCT	64110	64	TIME LEFT FOR REDESIGNATION-LPC ANGLE
A14671						ALTITUDE RATE
A14672						COMPUTED ALTITUDE
1468	42,2255	24113 1	OCT	24113	65	SAMPLED AGC TIME (HRS, MIN, SEC)
A14681						(FETCHED IN INTERRUPT)
1470	42,2256	62116 0	OCT	62116	66	LR RANGE
A14701						POSITION
1471	42,2257	04121 1	OCT	04121	67	LRVX
A14711						LRVY
A14712						LRVZ
1472	42,2260	64124 1	OCT	64124	68	SLANT RANGE TO LANDING SIGHT
A14721						TIME TO GO IN BRAKING PHASE
A14722						LR ALTITUDE - COMPUTED ALTITUDE
1473	42,2261	24127 0	OCT	24127	69	LANDING SITE CORRECTION, Z-COMPONENT
A14731						LANDING SITE CORRECTION, Y-COMPONENT
A14732						LANDING SITE CORRECTION, X-COMPONENT
1474	42,2262	04132 0	OCT	04132	70	AOT DETENT CODE/STAR CODE
1475	42,2263	04135 1	OCT	04135	71	AOT DETENT CODE/STAR CODE
1476	42,2264	02140 0	OCT	02140	72	RP 360 - TRUNNION ANGLE
A14761						SHAFT ANGLE
1477	42,2265	02143 0	OCT	02143	73	NEW RP 360 - TRUNNION ANGLE
A14771						SHAFT ANGLE
1478	42,2266	64146 0	OCT	64146	74	TIME TO IGNITION
A14781						YAW AFTER VEHICLE RISE
A14782						PITCH AFTER VEHICLE RISE
1479	42,2267	64151 0	OCT	64151	75	DELTA ALTITUDE CDH
A14791						DELTA TIME (CDH-CSI OR TPI-CDH)
A14792						DELTA TIME (TPI-CDH OR TPI-NCMTPI)
1480	42,2270	24154 1	OCT	24154	76	DESIRED HORIZONTAL VELOCITY

L PINBALL NOIN TABLES

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A14801						DESIRED RADIAL VELOCITY
A14802						CROSS-RANGE DISTANCE
1481	42,2271	62157 0		00T	62157	77 TIME TO ENGINE CUTOFF
A14811						VELOCITY NORMAL TO CSM PLANE
1482	42,2272	64162 0		00T	64162	78 RR RANGE
A14821						RANGE RATE
A14822						TIME FROM IGNITION
1483	42,2273	24165 0		00T	24165	79 CURSOR ANGLE
A14831						SPIRAL ANGLE
A14832						POSITION CODE
1484	42,2274	02170 0		00T	02170	80 DATA INDICATOR
A14841						CMEGA
1485	42,2275	24173 1		00T	24173	81 DELTA V (LV)
1486	42,2276	24176 1		00T	24176	82 DELTA V (LV)
1487	42,2277	24201 1		00T	24201	83 DELTA V (BCDY)
1488	42,2300	24204 1		00T	24204	84 DELTA V (OTHER VEHICLE)
1489	42,2301	24207 1		00T	24207	85 VG (BCDY)
1490	42,2302	24212 0		00T	24212	86 VG (LV)
1491	42,2303	02215 0		00T	02215	87 BACKLASH OPTICS LOS AZIMUTH
A14911						ELEVATION
1492	42,2304	24220 1		00T	24220	88 HALF UNIT SUN OR PLANET VECTOR
1493	42,2305	24223 1		00T	24223	89 LANDMARK LATITUDE
A14931						LONGITUDE/2
A14932						ALTITUDE
1494	42,2306	24226 1		00T	24226	90 Y
A14941						Y DOT
A14942						PSI
1495	42,2307	04231 0		00T	04231	91 ALTITUDE
A14951						VELOCITY
A14952						FLIGHT PATH ANGLE
1496	42,2310	00000 1		00T	00000	92 SPARE
1497	42,2311	04237 0		00T	04237	93 DELTA GYRO ANGLES
1498	42,2312	00000 1		00T	00000	94 SPARE
1499	42,2313	00000 1		00T	0	95 SPARE
1500	42,2314	00000 1		00T	0	96 SPARE
1501	42,2315	04253 1		00T	04253	97 SYSTEM TEST INPUTS
1502	42,2316	04256 1		00T	04256	98 SYSTEM TEST RESULTS
1503	42,2317	24261 1		00T	24261	99 RMS IN POSITION
A15031						RMS IN VELOCITY
A15032						RMS IN BIAS
R1504	END OF ANADTAB FOR MIX D ACUS					

A1800						AN	NORMAL ACUS
1801	42,2320	00000 1	MMTYPTAE	00T	00000	00 NOT IN USE	
1802	42,2321	04040 1		00T	04040	01 30CMP FRACTIONAL	
1803	42,2322	04140 0		00T	04140	02 30CMP WHOLE	
1804	42,2323	04102 0		00T	04102	03 30CMP CCL DEGREES	
1805	42,2324	00504 0		00T	00504	04 10CMP CPDEG(360)	
1806	42,2325	00504 0		00T	00504	05 10CMP CPDEG(360)	

L PINBALL ACUM TABLES

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1807	42,2326	04000 0	CCT	04000	06 3CCMP	CCTAL ONLY
1808	42,2327	04000 0	CCT	04000	07 3CCMP	CCTAL ONLY
1809	42,2330	04000 0	CCT	04000	08 3CCMP	CCTAL ONLY
1810	42,2331	04000 0	CCT	04000	09 3CCMP	CCTAL ONLY
1811	42,2332	00000 1	OCT	00000	10 1CCMP	CCTAL ONLY
1812	42,2333	24400 0	CCT	24400	11 3CCMP	FMS (DEC ONLY)
1813	42,2334	02000 0	OCT	02000	12 2CCMP	CCTAL ONLY
1814	42,2335	24400 0	CCT	24400	13 3CCMP	FMS (DEC ONLY)
1815	42,2336	04140 0	CCT	04140	14 3CCMP	WFCLE
1816	42,2337	00000 1	CCT	00000	15 1CCMP	CCTAL ONLY
1817	42,2340	24400 0	CCT	24400	16 3CCMP	FMS (DEC ONLY)
1818	42,2341	00000 1	CCT	0	17	SPARE
1819	42,2342	04102 0	OCT	04102	18 2CCMP	CCU DEG
1820	42,2343	00000 1	CCT	00000	19	SPARE
1821	42,2344	04102 0	OCT	04102	20 3CCMP	CCU DEGREES
1822	42,2345	04140 0	CCT	04140	21 3CCMP	WFCLE
1823	42,2346	04102 0	CCT	04102	22 3CCMP	CCU DEGREES
1824	42,2347	00000 1	CCT	00000	23	SPARE
1825	42,2350	24400 0	CCT	24400	24 3CCMP	FMS (DEC ONLY)
1826	42,2351	04140 0	CCT	04140	25 3CCMP	WFCLE
1827	42,2352	04000 0	OCT	04000	26 3CCMP	CCTAL ONLY
1828	42,2353	00140 1	CCT	00140	27 1CCMP	WFCLE
1829	42,2354	00000 1	OCT	00000	28	SPARE
1830	42,2355	00000 1	CCT	00000	29	SPARE
1831	42,2356	00000 1	CCT	0	30	SPARE
1832	42,2357	00000 1	CCT	0	31	SPARE
1833	42,2360	24400 0	CCT	24400	32 3CCMP	FMS (DEC ONLY)
1834	42,2361	24400 0	CCT	24400	33 3CCMP	FMS (DEC ONLY)
1835	42,2362	24400 0	OCT	24400	34 3CCMP	FMS (DEC ONLY)
1836	42,2363	24400 0	CCT	24400	35 3CCMP	FMS (DEC ONLY)
1837	42,2364	24400 0	OCT	24400	36 3CCMP	FMS (DEC ONLY)
1838	42,2365	24400 0	OCT	24400	37 3CCMP	FMS (DEC ONLY)
1839	42,2366	24400 0	CCT	24400	38 3CCMP	FMS (DEC ONLY)
1840	42,2367	00000 1	OCT	00000	39	SPARE

R18401 END OF MNTYPTAB FOR NORMAL ACUMS

				MM MIXED ACUMS	
A18402				40 3CCMP	MIN/SEC, VEL3, VEL3
1841	42,2370	24500 1	OCT	24500	(NO LOAD, DEC ONLY)
A18411				41 2CCMP	CCU DEG, ELEV DEG
1842	42,2371	00542 1	CCT	00542	POS4, PCS4, VEL3
1843	42,2372	24410 1	CCT	24410	(DEC ONLY)
A18431				43 3CCMP	CPDEG(360), CPDEG(360), PCS4
1844	42,2373	20204 0	OCT	20204	(DEC ONLY)
A18441				44 3CCMP	PCS4, PCS4, MIN/SEC
1845	42,2374	00410 1	OCT	00410	(NO LOAD, DEC ONLY)
A18451				45 3CCMP	WFCLE, MIN/SEC, CPDEG(360)
1846	42,2375	10000 0	CCT	10000	(NO LOAD, DEC ONLY)
A18461				46 1CCMP	CCTAL ONLY
1847	42,2376	00000 1	CCT	00000	

L PINBALL MOUNT TABLES

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1848	42,2377	00306 1	CCT	00306	47 20CMP	WEIGHT2 FOR EACH (DEC ONLY)
A18481						
1849	42,2400	01367 1	CCT	01367	48 20CMP	TRIM DEG2 FOR EACH (DEC ONLY)
A18491						
1850	42,2401	00510 0	CCT	00510	49 30CMP	PCS4, VEL3, WHOLE (DEC ONLY)
A18501						
1851	42,2402	00000 1	CCT	0	50	SPARE
1852	42,2403	00204 1	CCT	00204	51 20CMP	DPDEG(360), DPDEG(360) (DEC ONLY)
A18521						
1853	42,2404	00004 0	CCT	00004	52 10CMP	DPDEG(360)
1854	42,2405	00000 1	CCT	00000	53	SPARE
1855	42,2406	10507 1	CCT	10507	54 30CMP	PCS5, VEL3, DPDEG(360) (DEC ONLY)
A18551						
1858	42,2407	10200 1	CCT	10200	55 30CMP	WHOLE, DPDEG(360), DPDEG(360) (DEC ONLY)
A18581						
1859	42,2410	00204 1	CCT	00204	56 20CMP	DPDEG(360), DPDEG(360)
1860	42,2411	00000 1	CCT	00000	57	SPARE (DEC ONLY)
A18601						
1861	42,2412	24510 0	CCT	24510	58 30CMP	PCS4, VEL3, VEL3 (DEC ONLY)
A18611						
1862	42,2413	24512 1	CCT	24512	59 30CMP	VEL3 FOR EACH (DEC ONLY)
A18621						
1863	42,2414	60512 1	CCT	60512	60 30CMP	VEL3, VEL3, CCMP ALT (DEC ONLY)
A18631						
1864	42,2415	54000 0	CCT	54000	61 30CMP	MIN/SEC, MIN/SEC, POS7 (NO LOAD, DEC ONLY)
A18641						
1865	42,2416	24012 1	CCT	24012	62 30CMP	VEL3, MIN/SEC, VEL3 (NO LOAD, DEC ONLY)
A18651						
1866	42,2417	60512 1	CCT	60512	63 30CMP	VEL3, VEL3, CCMP ALT (DEC ONLY)
A18661						
1867	42,2420	60500 1	CCT	60500	64 30CMP	2INT, VEL3, CCMP ALT (NO LOAD, DEC ONLY)
A18671						
1868	42,2421	00000 1	CCT	00000	65 30CMP	HMS (DEC ONLY)
1869	42,2422	00016 0	CCT	00016	66 20CMP	LANDING RADAR ALT, POSITION (NO LOAD, DEC ONLY)
A18691						
1870	42,2423	53223 1	CCT	53223	67 30CMP	LANDING RADAR VELX, Y, Z
1871	42,2424	61026 0	CCT	61026	68 30CMP	POS7, MIN/SEC, CCMP ALT (NO LOAD, DEC ONLY)
A18711						
1872	42,2425	61430 1	CCT	61430	69 30CMP	CCMP ALT, CCMP ALT, CCMP ALT (DEC ONLY)
A18721						
1873	42,2426	00000 1	CCT	0	70 30CMP	CCTAL ONLY FOR EACH
1874	42,2427	00000 1	CCT	0	71 30CMP	CCTAL ONLY FOR EACH
1875	42,2430	00102 1	CCT	00102	72 20CMP	360-CCU DEG, CCU DEG
1876	42,2431	00102 1	CCT	00102	73 20CMP	360-CCU DEG, CCU DEG
1877	42,2432	10200 1	CCT	10200	74 30CMP	MIN/SEC, DPDEG(360), DPDEG(360) (NO LOAD, DEC ONLY)
A18771						
1878	42,2433	00010 0	CCT	00010	75 30CMP	PCS4, MIN/SEC, MIN/SEC (NO LOAD, DEC ONLY)
A18781						
1879	42,2434	20512 0	CCT	20512	76 30CMP	VEL3, VEL3, PCS4 (DEC ONLY)
A18791						

L PINBALL NCUN TABLES

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1880	42,2435	00500 1	OCT	00500	77 2CCMP	MIN/SEC, VEL3 (NO LOAD, DEC ONLY)
A18801						
1881	42,2436	00654 0	CCT	00654	78 3CCMP	RR RANGE, RR RANGE RATE, M/S (NO LOAD, DEC ONLY)
A18911						
1882	42,2437	00102 1	CCT	00102	79 3CCMP	CDU DEG, CDU DEG, WHOLE (DEC ONLY)
A18821						
1883	42,2440	00200 0	CCT	00200	80 2CCMP	WHOLE, DPDEG(360)
1884	42,2441	24512 1	CCT	24512	81 3CCMP	VEL3 FOR EACH (DEC ONLY)
A18841						
1885	42,2442	24512 1	OCT	24512	82 3CCMP	VEL3 FOR EACH (DEC ONLY)
A18851						
1886	42,2443	24512 1	CCT	24512	83 3CCMP	VEL3 FOR EACH (DEC ONLY)
A18861						
1887	42,2444	24512 1	CCT	24512	84 3CCMP	VEL3 FOR EACH (DEC ONLY)
A18871						
1888	42,2445	24512 1	CCT	24512	85 3CCMP	VEL3 FOR EACH (DEC ONLY)
A18881						
1889	42,2446	24512 1	CCT	24512	86 3CCMP	VEL3 FOR EACH (DEC ONLY)
A18891						
1890	42,2447	00102 1	CCT	00102	87 2CCMP	CDL DEG FOR EACH
1891	42,2450	00000 1	CCT	0	88 3CCMP	FRAC FOR EACH (DEC ONLY)
A18912						
1892	42,2451	16143 0	OCT	16143	89 3CCMP	DPDEG(90), DPDEG(90), PCS5 (DEC ONLY)
A18921						
1893	42,2452	10507 1	CCT	10507	90 3CCMP	PCS5, VEL3, DPDEG(360) (DEC ONLY)
A18931						
1894	42,2453	10450 1	CCT	10450	91 3CCMP	PCS4, VEL2, DPDEG(360)
1895	42,2454	00000 1	CCT	00000	92	SPARE
1896	42,2455	06143 1	CCT	06143	93 3CCMP	DPDEG(90) FOR EACH
1897	42,2456	00000 1	CCT	00000	94	SPARE
1898	42,2457	00000 1	OCT	0	95	SPARE
1899	42,2460	00000 1	CCT	0	96	SPARE
1900	42,2461	00000 1	OCT	00000	97 3CCMP	WHOLE FOR EACH
1901	42,2462	00000 1	CCT	00000	98 3CCMP	WHOLE, FPAC, WHOLE
1902	42,2463	71572 1	CCT	71572	99 3CCMP	PCS9, VEL4, RADIAN (DEC ONLY)
A19021						
R1903	END OF ANTYPTAB FOR MIXED NCUNS					
2200	42,2464	00006 1	SFINTAB	OCT	00006	WHOLE, CP TIME (SEC)
2201	42,2465	03240 1	OCT	03240		
2202	42,2466	00000 1	CCT	00000		SPARE
2203	42,2467	00000 1	CCT	00000		
2204	42,2470	00000 1	CCT	00000		CDL DEGREES, 360-CDU DEGREES (SFCONS IN DEGINSF)
2205	42,2471	00000 1	CCT	00000		
2206	42,2472	10707 0	OCT	10707		CP DEGREES (90)
2207	42,2473	03435 0	CCT	03435		UPPED BY 1
2208	42,2474	13070 1	CCT	13070		CP DEGREES (360)(POINT BETWN BITS 11-12)
2209	42,2475	34345 1	OCT	34345		UPPED BY 1
2210	42,2476	00005 1	CCT	00005		DEGREES (180)

L FINBALL NCUN TABLES

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2211	42,2477	21616 0	OCT	21616	
2212	42,2510	26113 0	CCT	26113	WEIGHT2
2213	42,2511	31713 0	OCT	31713	
2214	42,2512	00070 0	OCT	00070	POSITION5
2215	42,2513	20460 1	CCT	20460	
2216	42,2514	01165 0	CCT	01165	POSITION4
2217	42,2515	05740 1	CCT	05740	
2218	42,2516	11414 0	CCT	11414	VELOCITY2 (POINT BETWEEN BITS 11-12)
2219	42,2517	31463 1	CCT	31463	
2220	42,2518	07475 0	CCT	07475	VELOCITY2
2221	42,2511	16051 1	CCT	16051	
2222	42,2512	00001 0	OCT	00001	ELEVATION DEGREES
2223	42,2513	03434 1	CCT	03434	
2224	42,2514	00047 1	OCT	00047	RANGE2VCUS RADAR RANGE
2225	42,2515	21135 0	CCT	21135	
2226	42,2516	77766 0	CCT	77766	RANGE2VCUS RADAR RANGE RATE
2227	42,2517	50711 0	OCT	50711	
2228	42,2520	00005 1	2DEC*	.9267840595 E5	B-28 * LANDING RADAR ALTITUDE
2229	42,2521	25006 0			
2230	42,2522	00002 0	OCT	00002	INITIAL/FINAL ALTITUDE
2231	42,2523	23224 1	CCT	23224	
2232	42,2524	00014 1	CCT	00014	ALTITUDE RATE
2233	42,2525	06500 1	CCT	06500	
2234	42,2526	00012 1	CCT	00012	FORWARD/LATERAL VELOCITY
2235	42,2527	36455 0	OCT	36455	
2236	42,2530	04256 1	CCT	04256	ROT HAND CONT ANGLE RATE
2237	42,2531	07071 0	CCT	07071	
2238	42,2532	77766 0	2DEC*	-1.552795030 E5	B-28 * LANDING RADAR VELX
2239	42,2533	60557 0			
2240	42,2534	00005 1	2DEC*	.8250625087 E5	B-28 * LANDING RADAR VFY
2241	42,2535	01114 1			
2242	42,2536	00007 0	2DEC*	1.153668673 E5	B-28 * LANDING RADAR VELZ
2243	42,2537	01247 1			
2244	42,2540	04324 0	CCT	04324	POSITION7
2245	42,2541	27600 1	CCT	27600	
2246	42,2542	00036 1	OCT	00036	TRIM DEGREES2
2247	42,2543	20440 0	CCT	20440	
2248	42,2544	00035 1	CCT	00035	COMPUTER ALTITUDE
2249	42,2545	30400 0	CCT	30400	
2250	42,2546	23420 0	CCT	23420	CP DEGREES
2251	42,2547	00000 1	CCT	00000	
2252	42,2550	01670 1	2DEC	30480 B-19	POSITION 9
2253	42,2551	20000 0			
2254	42,2552	07475 0	2DEC	30.48 B-7	VELOCITY4
2255	42,2553	16051 1			
2256	42,2554	14400 0	2DEC	100 B-8	RADIANS
2257	42,2555	00000 1			
A2258					END OF SPINTAB

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2300	42,2556	05174 0	SECUTAB	CCT	05174	WHOLE, CP TIME (SEC)
2301	42,2557	13261 0		CCT	13261	
2302	42,2560	00000 1		OCT	00000	SPARE
2303	42,2561	00000 1		CCT	00000	
2304	42,2562	00000 1		CCT	00000	CDU DEGREES, 360-CDU DEGREES
2305	42,2563	00000 1		OCT	00000	(SFCNS IN DEGOUTSF, 360-CDU)
2306	42,2564	00714 0		CCT	00714	CP DEGREES (90) (POINT BETWN BITS 7-8)
2307	42,2565	31463 1		CCT	31463	
2308	42,2566	13412 1		OCT	13412	DP DEGREES (360)
2309	42,2567	07534 1		CCT	07534	
2310	42,2570	05605 1		CCT	05605	CFGRFES (180)
2311	42,2571	03656 1		CCT	03656	
2312	42,2572	00001 0		CCT	00001	WEIGHT2
2313	42,2573	16170 0		OCT	16170	
2314	42,2574	00441 0		CCT	00441	POSITION5
2315	42,2575	34306 0		CCT	34306	
2316	42,2576	07176 0		OCT	07176	POSITION4 (POINT BETWN BITS 7-8)
2317	42,2577	21603 1		CCT	21603	
2318	42,2600	15340 1		CCT	15340	VELOCITY2
2319	42,2601	15340 1		CCT	15340	
2320	42,2602	01031 1		CCT	01031	VELOCITY3 (POINT BETWN BITS 7-8)
2321	42,2603	21032 0		OCT	21032	
2322	42,2604	34631 1		CCT	34631	ELEVATION DEGREES
2323	42,2605	23146 0		CCT	23146	
2324	42,2606	00636 1		OCT	00636	RENDEZVOUS RADAR RANGE
2325	42,2607	14552 0		CCT	14552	
2326	42,2610	74552 0		OCT	74552	RENDEZVOUS RADAR RANGE RATE
2327	42,2611	70307 1		CCT	70307	
2328	42,2612	05520 0		ZDEC	1.079 E-5 E14	LANDING RADAR ALTITUDE
2329	42,2613	15312 0				
2330	42,2614	14226 1		CCT	14226	INITIAL/FINAL ALTITUDE
2331	42,2615	31757 0		OCT	31757	
2332	42,2616	02476 0		OCT	02476	ALTITUDE RATE
2333	42,2617	05531 0		CCT	05531	
2334	42,2620	02727 1		CCT	02727	FORWARD/LATERAL VELOCITY
2335	42,2621	16415 0		CCT	16415	
2336	42,2622	00007 0		CCT	00007	RCT HAND CNT ANGLE RATE
2337	42,2623	13734 0		OCT	13734	
2338	42,2624	74477 0		ZDEC	-.6440 E-5 E14	LANDING RADAR VELX
2339	42,2625	50643 0				
2340	42,2626	06265 0		ZDEC	1.212 E-5 E14	LANDING RADAR VFY
2341	42,2627	16004 1				
2342	42,2630	04426 0		ZDEC	.8668 E-5 E14	LANDING RADAR VELZ
2343	42,2631	31433 1				
2344	42,2632	34772 1		CCT	34772	POSITION7
2345	42,2633	07016 1		OCT	07016	
2346	42,2634	01030 0		CCT	01030	TRIM CFGRFES2
2347	42,2635	33675 0		OCT	33675	
2348	42,2636	01046 1		OCT	01046	COMPUTED ALTITUDE
2349	42,2637	15700 1		CCT	15700	

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2350	42,2640	00321	1	CCT	00321	CP DEGREES
2351	42,2641	26706	1	CCT	26706	
2352	42,2642	04231	0	2DEC	17.2610495	E-7 POSITION 9
2352	42,2643	27400	0			
2353	42,2644	01031	1	2DEC	.032808395	VELOCITY4
2353	42,2645	21032	0			
2354	42,2646	12172	0	2DEC	.32	RADIANS
2354	42,2647	24122	1			
A2350						END OF SEQ

END OF SEOUTAB

A2400

AA SE CONSTANT

SF ROUTINE

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2438					42,2715	00000 1	OCT	00000	52 SPARE COMPONENT	
2439					42,2716	00000 1	OCT	00000	52 SPARE COMPONENT	
2441					42,2717	00000 1	OCT	00000	53 SPARE	
2441					42,2720	00000 1	OCT	00000	53	
2442					42,2721	00000 1	OCT	00000	53	
2443	REF	7	LAST	115	42,2722	02200 1	ECADR	RANGE	54 POS5	CP1
2444	REF	2	LAST	116	42,2723	02202 0	ECADR	RATE	54 VEL3	CP3
2445	REF	3	LAST	116	42,2724	02204 0	ECADR	RTETA	54 DPDEG(360)	CP4
2446	REF	2	LAST	199	42,2725	03466 0	ECADR	NA	55 WHOLE	ARTF
2447	REF	3	LAST	199	42,2726	02256 1	ECADR	FLCV	55 DPDEG(360)	DP4
2448	REF	2	LAST	199	42,2727	02620 0	ECADR	CENTANG	55 DPDEG(360)	DP4
2449	REF	5	LAST	301	42,2730	02200 1	ECADR	RR-AZ	56 DPDEG(360)	DP4
2450	REF	2	LAST	301	42,2731	02202 0	ECADR	RR-ELFV	56 DPDEG(360)	DP4
2451					42,2732	00000 1	OCT	0	56 SPARE COMPONENT	
2452					42,2733	00000 1	OCT	0	57 SPARE	
2453					42,2734	00000 1	OCT	0	57 SPARE	
2454					42,2735	00000 1	OCT	0	57 SPARE	
2455	REF	3	LAST	142	42,2736	03605 1	ECADR	PCSTPI	58 PCS4	DP3
2456	REF	5	LAST	142	42,2737	03575 0	ECADR	DELVTPI	58 VEL3	DP3
2457	REF	2	LAST	199	42,2740	02347 0	ECADR	DELVTPI	58 VEL3	CP3
2458	REF	1			42,2741	02302 1	ECADR	DVICS	59 VEL3	DP3
2459	REF	2	LAST	316	42,2742	02304 1	ECADR	DVLOS +2	59 VEL3	CP3
2460	REF	2	LAST	316	42,2743	02306 0	ECADR	DVLOS +4	59 VEL3	CP3
2461	REF	2	LAST	120	42,2744	02262 0	ECADR	VHORIZ	60 VEL3	CP3
2462	REF	3	LAST	148	42,2745	03473 1	ECADR	HODTDISP	60 VEL3	CP3
2463	REF	1			42,2746	03774 0	ECADR	HCALC1	60 COMP ALT	DP1
2464	REF	2	LAST	148	42,2747	03475 1	ECADR	TTFDISP	61 MIN/SEC	M/S
2465	REF	12	LAST	315	42,2750	03453 0	ECADR	TTCGC	61 MIN/SEC	M/S
2466	REF	2	LAST	122	42,2751	02616 1	ECADR	CLTCFPLN	61 PCS7	DP4
2467	REF	2	LAST	148	42,2752	03471 0	ECADR	ABVEL	62 VEL3	CP3
2468	REF	12	LAST	316	42,2753	03453 0	ECADR	TTCGC	62 MIN/SEC	M/S
2469	REF	3	LAST	315	42,2754	03517 0	ECADR	DVTOTAL	62 VEL3	DP3
2470	REF	3	LAST	316	42,2755	03471 0	ECADR	ABVEL	63 VEL3	CP3
2471	REF	4	LAST	316	42,2756	03473 1	ECADR	HODTDISP	63 VEL3	DP3
2472	REF	2	LAST	316	42,2757	03774 0	ECADR	HCALC1	63 COMP ALT	DP1
2473	REF	5	LAST	151	42,2760	03666 1	ECADR	FUNNYDSP	64 ZINT	ZINT
2474	REF	5	LAST	316	42,2761	03473 1	ECADR	HODTDISP	64 VEL3	DP3
2475	REF	2	LAST	148	42,2762	03534 0	ECADR	HCALC	64 COMP ALT	CP1
2476	REF	2	LAST	208	42,2763	00013 0	ECADR	SAMPTIME	65 HMS (MIXED ONLY TO KEEP CODE 65)	HMS
2477	REF	3	LAST	316	42,2764	00013 0	ECADR	SAMPTIME	65 HMS	HMS
2478	REF	4	LAST	316	42,2765	00013 0	ECADR	SAMPTIME	65 HMS	HMS
2479	REF	3	LAST	278	42,2766	02206 1	ECADR	RSTACK +6	66 LANDING RADAR ALT	DP1
2480					42,2767	00000 1	OCT	0	66 LR POSITION	LRPCS
2481					42,2770	00000 1	OCT	0	66 SPARE COMPONENT	
2482	REF	4	LAST	316	42,2771	02200 1	ECADR	RSTACK	67 LANDING RADAR VELX	DP1
2483	REF	5	LAST	316	42,2772	02202 0	ECADR	RSTACK +2	67 LANDING RADAR VELX	CP1
2484	REF	6	LAST	316	42,2773	02204 0	ECADR	RSTACK +4	67 LANDING RADAR VELZ	CP1
2485	REF	2	LAST	123	42,2774	02616 1	ECADR	PANGEDSP	68 PCS7	DP4
2486	REF	3	LAST	316	42,2775	03475 1	ECADR	TTFDISP	68 MIN/SEC	M/S
2487	REF	3	LAST	201	42,2776	02664 0	ECADR	DELTAH	68 COMP ALT	DP1

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2468	REF	1		42,2777	02640 1	ECADR	DLANDZ	69 COMP ALT	CP1
2469	REF	1		42,2800	02636 0	ECADR	DLANDY	69 COMP ALT	DP1
2470	REF	1		42,2801	02634 1	ECADR	DLANDX	69 COMP ALT	CP1
2491	REF	2	LAST	246	42,3002	00734 1	ECADR	ACTCODE	70 COTAL ONLY
2492	REF	4	LAST	317	42,3003	00735 0	ECADR	ACTCODE +1	70 COTAL ONLY
2493	REF	5	LAST	317	42,3004	00736 0	ECADR	ACTCODE +2	70 COTAL ONLY
2494	REF	6	LAST	317	42,3005	00734 1	ECADR	ACTCODE	71 COTAL ONLY
2495	REF	7	LAST	317	42,3006	00735 0	ECADR	ACTCODE +1	71 COTAL ONLY
2496	REF	8	LAST	317	42,3007	00736 0	ECADR	ACTCODE +2	71 COTAL ONLY
2497	REF	2	LAST	300	42,3010	00035 1	ECADR	CCUT	72 360-CCU DEG
2498	REF	3	LAST	199	42,3011	00036 1	ECADR	COLS	72 CUL DEG
2499					42,3012	00037 1	CCT		72 SPARE COMPONENT
2500	REF	2	LAST	102	42,3013	01106 1	ECADR	TANG	73 360-CCU DEG
2501	REF	3	LAST	317	42,3014	01107 0	ECADR	TANG +1	73 CUL DEG
2502					42,3015	00000 1	CCT	0	73 SPARE COMPONENT
2503	REF	14	LAST	316	42,3016	02452 0	ECADR	TTCGC	74 MIN/SEC
2504	REF	2	LAST	121	42,3017	02362 1	ECADR	YAW	74 DPDEG(360)
2505	REF	1			42,3020	02364 1	ECADR	PITCH	74 DPDEG(360)
2506	REF	3	LAST	199	42,3021	02577 1	ECADR	DIFALT	75 PCS4
2507	REF	2	LAST	118	42,3022	02252 0	ECADR	TITOT2	75 MIN/SEC
2508	REF	1			42,3023	02254 0	ECADR	T2TCT3	75 MIN/SEC
2509	REF	3	LAST	201	42,3024	02276 0	ECADR	ZDOTD	76 VFL3
2510	REF	2	LAST	120	42,3025	02272 1	ECADR	RCCTE	76 VEL3
2511	REF	2	LAST	152	42,3026	02642 1	ECADR	XRANGE	76 PFS4
2512	REF	15	LAST	317	42,3027	03453 0	ECADR	TTCGC	77 MIN/SEC
2513	REF	2	LAST	120	42,3030	02310 1	ECADR	YFCT	77 VEL3
2514					42,3031	00000 1	CCT	0	77 SPARE COMPONENT
2515	REF	4	LAST	197	42,3032	01330 0	ECADR	DNRRANGE	78 RR RANGE
2516	REF	2	LAST	107	42,3033	01331 1	ECADR	DNPRDCT	78 RR RANGE RATE
2517	REF	1			42,3034	01271 1	ECADR	TITOTIG	78 MIN/SEC
2518	REF	2	LAST	261	42,3035	01235 1	ECADR	CUPSCF	79 CUL DEG
2519	REF	2	LAST	261	42,3036	01237 0	ECADR	SPIRAL	79 CUL DEG
2520	REF	1			42,3037	01241 1	ECADR	POSCCCE	79 WHCLF
2521	REF	2	LAST	145	42,3040	02733 0	ECADR	DATAGCCE	80 WHCLF
2522	REF	1			42,3041	02734 1	ECADR	OMEGAD	80 CPDEG(360)
2523					42,3042	00000 1	CCT	0	80 SPARE COMPONENT
2524	REF	2	LAST	140	42,3043	03433 0	ECADR	DELVLVC	81 VFL3
2525	REF	3	LAST	317	42,3044	03435 0	ECADR	DELVLVC +2	81 VFL3
2526	REF	4	LAST	317	42,3045	03437 1	ECADR	DELVLVC +4	81 VEL3
2527	REF	5	LAST	317	42,3046	03433 0	ECADR	DELVLVC	82 VFL3
2528	REF	6	LAST	317	42,3047	03435 0	ECADR	DELVLVC +2	82 VEL3
2529	REF	7	LAST	317	42,3050	03437 1	ECADR	DELVLVC +4	82 VEL3
2530	REF	1			42,3051	03622 1	ECADR	DELVINU	83 VEL3
2531	REF	2	LAST	317	42,3052	03624 1	ECADR	DELVINU +2	83 VEL3
2532	REF	3	LAST	317	42,3053	03626 0	ECADR	DELVINU +4	83 VEL3
2533	REF	1			42,3054	02222 1	ECADR	DELVCV	84 VFL3
2534	REF	2	LAST	317	42,3055	02224 1	ECADR	DELVCV +2	84 VEL3
2535	REF	3	LAST	317	42,3056	02226 0	ECADR	DELVCV +4	84 VFL3
2536	REF	3	LAST	148	42,3057	03501 0	ECADR	VGRDXY	85 VFL3
2537	REF	4	LAST	317	42,3060	02502 1	ECADR	VGRDXY +2	85 VFL3

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2538	REF	5	LAST	317	42,3061	03505 1	ECADR	VGBODY +4	85	VEL2	DR3
2539	REF	8	LAST	317	42,3062	03433 0	ECADR	DELVLVC	86	VEL3	DR3
2540	REF	9	LAST	318	42,3063	03435 0	ECADR	DELVLVC +2	86	VEL3	DP3
2541	REF	10	LAST	318	42,3064	03437 1	ECADR	DELVLVC +4	86	VEL3	DP3
2542	REF	3	LAST	246	42,3065	01344 0	ECADR	AZ	87	CDL DEG	CCL
2543	REF	1			42,3066	01345 1	ECADP	FL	87	CDL DEG	CCU
2544					42,3067	00000 1	CCT	0	87	SPARE CCMRCNENT	
2545	REF	10	LAST	252	42,3070	02706 1	ECADR	STARAC	88	FRAC	FRAC
2546	REF	11	LAST	318	42,3071	02710 0	ECADR	STARAC +2	88	FRAC	FRAC
2547	REF	12	LAST	318	42,3072	02712 1	ECADR	STARAC +4	88	FRAC	FRAC
2548	REF	2	LAST	124	42,3073	02706 1	ECADR	LANDLAT	89	CPCEG(90)	DP3
2549	REF	2	LAST	124	42,3074	02710 0	ECADR	LANDLNG	89	CPCEG(90)	DP3
2550	REF	1			42,3075	02712 1	ECADR	LANDALT	89	PCS5	DR1
2551	REF	8	LAST	316	42,3076	02200 1	ECADR	RANGE	90	PCS5	DP1
2552	REF	4	LAST	316	42,3077	02202 0	ECADR	PRATE	90	VEL3	DR3
2553	REF	4	LAST	316	42,3100	02204 0	ECADR	RTHETA	90	CPCEG(360)	DP4
2554	REF	1			42,3101	03715 1	ECADR	P21ALT	91	PCS4	DR3
2555	REF	2	LAST	149	42,3102	03711 0	ECADR	R21VEL	91	VEL2	DR4
2556	REF	2	LAST	149	42,3103	03713 1	ECADR	P21GAM	91	CPCEG(360)	DR4
2557					42,3104	00000 1	CCT	00000	92	SPARE	
2558					42,3105	00000 1	CCT	00000	92		
2559					42,3106	00000 1	CCT	00000	92		
2560	REF	6	LAST	274	42,3107	02737 0	ECADR	CGC	93	CPCEG(90)	DR3
2561	REF	7	LAST	318	42,3110	02741 1	ECADR	QGC +2	93	CPCEG(90)	DP3
2562	REF	8	LAST	318	42,3111	02743 0	ECADR	QGC +4	93	CPCEG(90)	DP3
2563					42,3112	00000 1	CCT	00000	94	SPARE	
2564					42,3113	00000 1	CCT	00000	94		
2565					42,3114	00000 1	CCT	00000	94		
2566					42,3115	00000 1	CCT	0	95	SPARE	
2567					42,3116	00000 1	CCT	0	95	SPARE	
2568					42,3117	00000 1	CCT	0	95	SPARE	
2569					42,3120	00000 1	CCT	0	96	SPARE	
2570					42,3121	00000 1	CCT	0	96	SPARE	
2571					42,3122	00000 1	CCT	0	96	SPARE	
2572	REF	10	LAST	315	42,3123	01044 0	ECADR	DSPTM1	97	WHCLE	ARTH
2573	REF	11	LAST	318	42,3124	01045 1	ECADR	DSPTM1 +1	97	WHCLE	ARTH
2574	REF	12	LAST	318	42,3125	01346 1	ECADR	DSPTM1 +2	97	WHCLE	ARTH
2575	REF	4	LAST	306	42,3126	01047 0	ECADR	DSPTM2	98	WHCLE	ARTH
2576	REF	5	LAST	318	42,3127	01050 0	ECADR	DSPTM2 +1	98	FRAC	FRAC
2577	REF	6	LAST	318	42,3130	01051 1	ECADR	DSPTM2 +2	98	WHCLE	ARTH
2578	REF	2	LAST	299	42,3131	02200 1	ECADR	WWPOS	99	PCS5	DP3
2579	REF	1			42,3132	02202 0	ECADR	WWVFL	99	VEL4	DR2
2580	REF	1			42,3133	02234 0	ECADR	WWBIAS	99	RACTIONS	DP4
R2600	END OF IDADCTAB										

A2800

NN SF ROUTINES

2801	42,3134	16351 1	RUTMXTAB	OCT	16351	40	M/S, DP3, DP3
2802	42,3135	00142 0		CCT	00142	41	CDU, ARTH

L FINBALL NOUN TABLES

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2803	42,3136	16347 0	CCT	16347	42 DP3, CP3, CP3
2804	42,3137	16512 0	CCT	16512	43 CP4, CP4, DP3
2805	42,3140	22347 1	CCT	22347	44 CP3, CP3, M/S
2806	42,3141	24443 1	CCT	24443	45 ARTH, M/S, DP4
2807	42,3142	00000 1	CCT	00000	46 CCT
2808	42,3143	00553 1	CCT	00553	47 ARITH1, ARITH1
2809	42,3144	00143 1	CCT	00143	48 ARTH, ARTH
2810	42,3145	06347 1	CCT	06347	49 CP3, CP3, ARTH
2811	42,3146	00000 1	CCT	0	50 SPARE
2812	42,3147	00512 1	CCT	00512	51 CP4, CP4
2813	42,3150	00012 1	CCT	00012	52 CP4
2814	42,3151	00000 1	CCT	00000	53 SPARE
2815	42,3152	24344 1	CCT	24344	54 CP1, CP3, CP4
2816	42,3153	24503 1	CCT	24503	55 ARTH, DP4, CP4
2817	42,3154	00512 1	CCT	00512	56 DP4, DP4
2818	42,3155	00000 1	CCT	0	57 SPARE
2819	42,3156	16347 0	CCT	16347	58 DP3, CP3, CP3
2820	42,3157	16347 0	CCT	16347	59 CP3, CP3, CP3
2821	42,3160	10347 0	CCT	10347	60 CP3, CP3, CP1
2822	42,3161	24451 1	CCT	24451	61 M/S, M/S, DP4
2823	42,3162	16447 1	CCT	16447	62 CP3, M/S, CP3
2824	42,3163	10347 0	CCT	10347	63 DP3, CP3, CP1
2825	42,3164	10354 0	CCT	10354	64 2INT, DP3, CP1
2826	42,3165	20410 0	CCT	20410	65 HMS, HMS, HMS
2827	42,3166	00304 0	CCT	00304	66 DP1, LRPCS
2828	42,3167	10204 0	CCT	10204	67 DP1, CP1, CP1
2829	42,3170	10452 0	CCT	10452	68 CP4, M/S, CP1
2830	42,3171	10204 0	CCT	10204	69 CP1, CP1, CP1
2831	42,3172	00000 1	CCT	0	70 CCT, CCT, CCT
2832	42,3173	00000 1	CCT	0	71 CCT, CCT, CCT
2833	42,3174	00115 1	CCT	00115	72 360-CDU, CDU
2834	42,3175	00115 1	CCT	00115	73 360-CDU, CDU
2835	42,3176	24511 1	CCT	24511	74 M/S, DP4, DP4
2836	42,3177	22447 0	CCT	22447	75 CP3, M/S, M/S
2837	42,3200	16347 0	CCT	16347	76 CP3, CP3, CP3
2838	42,3201	00351 0	CCT	00351	77 M/S, CP3
2839	42,3202	22756 0	CCT	22756	78 RR RANGE, RR RANGE RATE, M/S
2840	42,3203	06102 1	CCT	06102	79 CDL, CDL, ARTH
2841	42,3204	00503 1	CCT	00503	80 ARTH, DP4
2842	42,3205	16347 0	CCT	16347	81 CP3, CP3, CP3
2843	42,3206	16347 0	CCT	16347	82 DP3, CP3, CP3
2844	42,3207	16347 0	CCT	16347	83 CP3, CP3, CP3
2845	42,3210	16347 0	CCT	16347	84 CP3, CP3, CP3
2846	42,3211	16347 0	CCT	16347	85 CP3, CP3, CP3
2847	42,3212	16347 0	CCT	16347	86 CP3, CP3, CP3
2848	42,3213	00102 1	CCT	00102	87 CDL, CDL
2849	42,3214	02041 0	CCT	02041	88 FRAC FOR EACH
2850	42,3215	10347 0	CCT	10347	89 CP3, CP3, CP1
2851	42,3216	24344 1	CCT	24344	90 DP1, CP3, DP4
2852	42,3217	24507 0	CCT	24507	91 CP3, CP4, CP4

L PINBALL NOUN TABLES

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2853	42,3220	00000 1	CCT	00000	92 SPARE
2854	42,3221	16347 0	CCT	16347	93 CP3, CP3, CP3
2855	42,3222	00000 1	CCT	00000	94 SPARE
2856	42,3223	00000 1	CCT	0	95 SPARE
2857	42,3224	00000 1	CCT	0	96 SPARE
2858	42,3225	06143 1	CCT	06143	97 ARTH, ARTH, ARTH
2859	42,3226	06043 0	CCT	06043	98 ARTH, EPAC, ARTH
2860	42,3227	24247 0	CCT	24247	99 CP3, CP2, CP4
R2870	END OF RLTMXTAB				

2871 REF 3 LAST 293 30,2000

SBANK= LCKSUPER

L LEM GEOMETRY

LSFR'S PAGE NO. 1 EO S?

0001				23,241		EANK	23
000101	REF	1		13,2770		SETLOC	LEMGEOM
000102				13,277		EANK	

00015	REF	4	LAST	320	30,2000	SRANK=	LCWSLPER
0002	REF	3	LAST	124	55,1042	EBANK=	XSM

R0500 THESE TWO ROUTINES COMPUTE THE ACTUAL STATE VECTOR FOR LM,CSM BY ADDING
 R0501 THE CONIC R,V AND THE DEVIATIONS P,V. THE STATE VECTORS ARE CONVERTED TO
 R0502 METERS P-29 AND METERS/SEC B-7 AND STORED APPROPRIATELY IN RN,VN OR
 R0503 R-OTHER, V-OTHER FOR DOWNLINK. THE ROUTINE NAMES ARE SWITCHED IN THE
 R0504 OTHER VEHICLES COMPUTER.

R0505 INPLT

R0506 STATE VECTOR IN TEMPORARY STORAGE AREA
 R05061 IF STATE VECTOR IS SCALED PCS E27 AND VEL P5
 R05062 SET X2 TO +2
 R05063 IF STATE VECTOR IS SCALED PCS E29 AND VEL B7
 R05064 SET X2 TO 0

R0507 OUTPUT

R0508 R(T) IN RN, V(T) IN VN, T IN PIPTIME

R0509 OR

R0510 R(T) IN R-OTHER, V(T) IN V-OTHER (T IS DEFINED BY T-OTHER)

05106	REF	1				COUNT#	11/GEOM	
0511				13,2770	43414 1	SVDWA2	PCF	RVC
05112	REF	1		13,2771	74756 1			AVEMIDSW
05113				13,2772	26073 1			+I
05114				13,2773	52775 1		VLCAD	VSL*
0512	REF	2	LAST	111	01521 0			TDELTA V
0513				13,2775	57605 0			0 -7,2
0514				13,2776	53655 1		VAD	VSL*
0515	REF	2	LAST	111	01535 0			RCV
0516				13,2777	57576 1			0,2
0517	REF	4	LAST	196	01522 0		STCVL	RN
0518	REF	2	LAST	111	01527 0			TNUV
0519				13,2778	52257 1		VSL*	VAF
0520				13,2779	57602 1			0 -4,2
0521	REF	2	LAST	111	01543 1			VCV
0522				13,2780	77657 0		VSL*	0,2
0523				13,2781	57576 1			0,2
0524	REF	4	LAST	196	01522 0		STCDL	VN
0525	REF	3	LAST	307	01517 0			TFT
0526	REF	2	LAST	196	01234 0		STORE	PIPTIME
0527				13,2782	77616 0		RVC	

SW=1=AVETOMIC GOING W-MATRIX INTEG.

L LEM GEOMETRY

USER'S PAGE NO. 2 E5 S3

0528					13,2114	53775 1	SVCWN1	VLCAC	VSL*
0529	RFF	3	LAST	321	13,2115	01521 0			TDELTA V
0530					13,2116	57615 0			" -7,2
0531					13,2117	52655 1		VAD	VSL*
0532	RFF	3	LAST	321	13,2120	01535 0			RCV
0533					13,2121	57576 1			" ,2
0534	RFF	5	LAST	195	13,2122	25720 0		STCVL	R-OTHER
0535	RFF	3	LAST	321	13,2123	01527 0			TRUV
0536					13,2124	53257 1		VSL*	VAC
0537					13,2125	57602 1			" -4,2
0538	RFF	3	LAST	321	13,2126	01543 1			VCV
0539					13,2127	77657 0		VSL*	
0540					13,2130	57576 1			" ,2
0541	RFF	5	LAST	195	13,2131	01726 0		STORE	V-OTHER
0542					13,2132	77616 0		RVQ	

L LUMINOMETRY

USER'S PAGE NO. 2 E5 S2

R0649 THE FOLLOWING ROUTINE TAKES A HALF UNIT TARGET VECTOR REFERRED TO NAV EASE COORDINATES AND FINDS BOTH
 R0651 GIMBAL ORIENTATIONS AT WHICH THE RR MIGHT SIGHT THE TARGET. THE GIMBAL ANGLES CORRESPONDING TO THE PRESENT MODE
 R0653 ARE LEFT IN MODE1 AND THOSE WHICH WOULD BE USED AFTER A PENODE IN MODE2. THIS ROUTINE ASSUMES MODE 1 IS TRUNNICK
 R0655 ANGLE LESS THAN 90 DEGS IN ABS VALUE WITH ARBITRARY SHAFT, WITH A CORRESPONDING DEFINITION FOR MODE 2. MODE
 R0657 SELECTION AND LIMIT CHECKING ARE DONE ELSEWHERE.

R0658 THE MODE 1 CONFIGURATION IS CALCULATED FROM THE VECTOR AND THEN MODE 2 IS FOUND USING THE RELATIONS

R0660 $S(2) = 180 + S(1)$

R0661 $T(2) = 180 - T(1)$

R066101 THE VECTOR APPLIES IN MPAC WHERE TRG*SMNB OR *SMNB* WILL HAVE LEFT IT.

0662				13,2133	00141 1	RRANGLES STORE	32D	
06625				13,2134	57545 1	CLDAD	DOOMP	SINCE WE WILL FIND THE MODE 1 SHAFT
0663				13,2135	00043 0		34D	ANGLE LATER, WE CAN FIND THE MODE 1
0664				13,2136	67401 0	SETPD	ASIN	TRUNNICK BY SIMPLY TAKING THE ARCSIN OF
0665				13,2137	00001 0		0	THE Y COMPONENT, THE ASIN GIVING AN
0666				13,2140	44206 0	PUSH	ABSU	ANSWER WHOSE ABS VAL IS LESS THAN 90 DEG
0667	REF	1		13,2141	24005 1		LCDFHALF	
0668				13,2142	14005 1	STODL	4	MODE 2 TRUNNICK TO 4.
0669	REF	3	LAST	249	13,2143	24007 0	LD6ZPOS	
0670				13,2144	24043 0	STOVL	34D	UNIT THE PROJECTION OF THE VECTOR
0671				13,2145	00041 1		32D	IN THE X-Z PLANE
0672				13,2146	41056 1	UNIT	BCVB	IF OVERFLOW, TARGET VECTOR IS ALONG Y
0673	REF	1		13,2147	52432 1		LUNDESCH	CALL FOR MANEUVER UNLESS ON LUNAR SLPF
0674				13,2150	14041 1	STODL	32D	PROJECTION VECTOR.
0675				13,2151	00041 1		32D	
0676				13,2152	44142 0	SR1	STO	
0677	REF	1		13,2153	00051 0		S2	
0678	REF	3	LAST	301	13,2154	14023 0	STODL	SINTH
0679				13,2155	00045 0		36D	USE ARCTRG SINCE SHAFT COULD BE ARP.
0680				13,2156	77742 0	SR1		
0681	REF	3	LAST	301	13,2157	34021 0	STCALL	CESTH
0682	REF	3	LAST	301	13,2160	47322 1		ARCTRG

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0683				13,2161	43206 1	PUSH	DAD	MODE 1 SHIFT TO 2.
0684	REF	2	LAST	323	13,2162	24005 1	LODPHALF	
0685					13,2163	24007 0	STOVL	6
0686					13,2164	00005 1		4
0687					13,2165	77634 0	RTB	FIND MODE 2 CCL ANGLES.
0688	REF	1			13,2166	21636 1		2V1STC2S
0689	REF	2	LAST	103	13,2167	25111 1	STOVL	MCDEB
0690					13,2170	00001 0		0
0691					13,2171	77634 0	RTB	MODE 1 ANGLES TO MODE 1.
0692	REF	2	LAST	324	13,2172	21636 1		2V1STO2S
0693	REF	1			13,2173	01107 0	STOPE	MCDEA
0694					13,2174	77776 1	EXIT	
0695	REF	26	LAST	277	13,2175	4 0110 0	CS	RADMCRES
0696	REF	1			13,2176	7 4740 1	MASK	ANTENBIT
0697	REF	93	LAST	306	13,2177	10 000 0	CCS	A
0698					13,2200	1 2204 1	TCF	+4
0699	REF	2	LAST	324	13,2201	53'107 1	DXCH	MCDEA
0700	REF	3	LAST	324	13,2202	53'111 0	DXCH	MCDEB
0701	REF	2	LAST	324	13,2203	53'107 1	DXCH	MCDEA
0702	REF	10	LAST	300	13,2204	0 6042 1	TC	INTPRET
0703					13,2205	77650 1	ECTC	
0704	REF	2	LAST	323	13,2206	00051 0		S2

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P0705 GIVEN FR TRUNNION AND SHAFT (T,S) IN TANGAP,+1, FIND THE ASSOCIATED
 P0706 LINE OF SIGHT IN NAV BASE AXES. THE HALF UNIT VECTOR, .5(SIN(S)COS(T),
 P0707 -SIN(T),COS(S)COS(T)) IS LEFT IN MPAC AND 320.

07072	REF	1		23,2010			SETLCC INFLIGHT	
07074				23,2041			BANK	
07076	REF	1					CLUNT* \$1/GEOM	
0708				23,2041	47135 0	RRNB	SLCAD	RTR
0709	REF	4	LAST	202	23,2042			TANGAP
07091	REF	5	LAST	250	23,2043			CDLCCGIC
0710				23,2044	41471 1		SETPD	PUSH
0711				23,2045	00011 0			TRUNNION ANGLE TO 0
0712				23,2046	57556 0		SIN	DCCMP
0713				23,2047	14043 0		STODL	340
								Y COMPONENT
0714				23,2050	41546 0		CCS	PUSH
0715				23,2051	47135 0		SLCAD	RTR
0716	REF	5	LAST	325	23,2052			TANGAP +1
0717	REF	6	LAST	325	23,2053			CDLCCGIC
0718				23,2054	71476 0	RRNB1	PUSH	SHAFT ANGLE TO 2
0719				23,2055	72405 0		DMP	SL1
0720				23,2056	00001 0			
0721				23,2057	14043 0		STODL	360
								Z COMPONENT
0722				23,2060	41356 1		SIN	DMP
0723				23,2061	77752 1		SL1	
0724				23,2062	24041 1		STODL	320
0725				23,2063	00041 1			320
0726				23,2064	77616 0		RVQ	

R0727 THIS ENTRY TO RRNB REQUIRES THE TRUNNION AND SHAFT ANGLES IN MPAC AND MPAC +1 RESPECTIVELY

0729				23,2065	14025 0	RRNBMPAC	STODL	200	SAVE SHAFT CDL IN 21.
07291	REF	43	LAST	300	23,2066			MPAC	SET MODE TO DP. (THE PRECEEDING STORE
A17292									MAY BE DP, TP OR VECTOR.)
0730				23,2067	40234 1		RTR	SETPD	
0731	REF	7	LAST	325	23,2070			CDLCCGIC	
0732				23,2071	00001 0				
0733				23,2072	73406 1		PUSH	SIN	TRUNNION ANGLE TO 0
0734				23,2073	77676 0		DCCMP		
0735				23,2074	14043 0		STODL	340	Y COMPONENT
0736				23,2075	41546 0		COS	PUSH	.5COS(T) TO C
0737				23,2076	47135 0		SLCAD	RTR	PICK UP CDU'S.
0738				23,2077	00026 0			210	
0739	REF	8	LAST	325	23,2100			CDLCCGIC	
0740				23,2101	77650 1		CCTC		
0741	REF	9			23,2102			RRNB1	

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I INL COMPENSATION PACKAGE

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0001					27,2667				PANK	7	
000101	REF	1			06,2000				SETLOC	IMLCOMP	
000102					06,3271				PANK		
0002	PFF	1			53,1460				EPANK=	NEDX	
0100	RFF	1							COUNT*	11/ICOMP	
0112	RFF	1			06,3271	3	2537	C	CAF	LGCOMP	SAVE EPANK OF CALLING PROGRAM
0113	RFF	3	LAST	295	06,3272	56	403	1	XCH	EBANK	
0114	RFF	1			06,3273	54	163	1	TS	MODE	
0115	RFF	1			06,3274	11	477	C	CCS	GCOMP SW	EYPASS IF GCOMP SW NEGATIVE
0116					06,3275	1	330	0	TCF	+3	
0117					06,3276	1	330	0	TCF	+2	
0118	RFF	1			06,3277	1	3361	1	TCF	IRIG1	RETURN
0119	RFF	4	LAST	255	06,3300	3	4751	C	CAF	FOUR	PIPAZ, PIPAY, PIPAX
0120	RFF	9	LAST	123	06,3301	54	132	C	TS	RLF +2	
0121	RFF	1	LAST	327	06,3302	50	132	1	INDEX	RLF +2	
0122	RFF	1			06,3303	3	1453	1	CA	PIPASCF	(P.P.W.) X 2(-5)
0123					06,3304	0	0006	1	EXTEND		
0124	RFF	11	LAST	327	06,3305	5	2132	1	INDEX	RLF +2	
0125	RFF	1			06,3306	7	0324	0	NP	DELVX	(PP) X 2(+14) NOW (PIPA PULSES) X 2(+5)
0126	RFF	30	LAST	305	06,3307	54	202	1	TS	C	SAVE MAJOR PART
0127	RFF	26	LAST	294	06,3310	3	0001	0	CA	L	MINOR PART
0128					06,3311	0	0006	1	EXTEND		
0129	RFF	33	LAST	282	06,3312	7	4746	1	NP	BIT6	SCALE 2(+9) SHIFT RIGHT 9
0130	RFF	12	LAST	327	06,3313	50	132	1	INDEX	RLF +2	
0131	RFF	2	LAST	327	06,3314	54	325	1	TS	DELVX +1	FRACTIONAL PIPA PULSES SCALED 2(+14)
0132	RFF	31	LAST	327	06,3315	2	0002	0	CA	0	MAJOR PART
0133					06,3316	0	0006	1	EXTEND		
0134	RFF	34	LAST	327	06,3317	7	4746	1	NP	BIT6	SCALE 2(+9) SHIFT RIGHT 9
0135	RFF	13	LAST	327	06,3320	50	132	1	INDEX	RLF +2	
0136	RFF	2	LAST	327	06,3321	20	325	1	CAS	DELVX	(PIPAI) + (PIPAI)(SFE)
0137	RFF	14	LAST	327	06,3322	50	132	1	INDEX	RLF +2	
0138	RFF	1			06,3323	4	1452	1	CS	PIPAIAS	(PIPA PULSES)/(CS) X 2(-3) *
0139					06,3324	0	0006	1	EXTEND		
0140	RFF	2	LAST	166	06,3325	7	1074	1	NP	1/PIPADT	(CS) X 2(+8) NOW (PIPA PULSES) X 2(+5) *
0141					06,3326	0	0006	1	EXTEND		
0142	RFF	35	LAST	327	06,3327	7	4746	1	NP	BIT6	SCALE 2(+9) SHIFT RIGHT 9 *
0143	RFF	15	LAST	327	06,3330	50	132	1	INDEX	RLF +2	
0144	RFF	4	LAST	327	06,3331	20	325	1	CAS	DELVX	(PIPAI) + (PIPAI)(SFE) - (BIAS)(DELTAT)
0145	RFF	16	LAST	327	06,3332	10	132	0	CCS	RLF +2	PIPAZ, PIPAY, PIPAX
0146	RFF	1			06,3333	6	7752	0	AC	NEG1	
0147	RFF	1			06,3334	1	3301	1	TCF	1/PIPA1 +1	

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0148 06,3335 13 336 0 NOCP LESS THAN ZERO IMPOSSIBLE

L INCL COMPENSATION PACKAGE

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01481	REF	2	LAST	327	06,2336	55'477 0	IRIGCOMP	TS	GCOMP SW	INDICATE COMMANDS 2 PULSES OR LESS.
01482	REF	17	LAST	327	06,2337	54 120 1		TS	RUF	INDEX COUNTER . IRIGX, IRIGY, IRIGZ.
01483	REF	1			06,2340	0 3364 0		TC	IRIGX	COMPENSATE ACCELERATION TERMS
01484	REF	2	LAST	327	06,2341	4 1460 0		CS	NBDX	(GYRC PULSES)/(CS) X 2(-5)
01485	REF	1			06,2342	0 3462 1		TC	DRIFTSUB	-(NBDX)(DELTAT) (GYRC PULSES) X 2(+14)
01486	REF	1			06,2343	0 3401 1		TC	IRIGY	COMPENSATE ACCELERATION TERMS
01487	REF	1			06,2344	4 1461 1		CS	NBDY	(GYRC PULSES)/(CS) X 2(-5)
01488	REF	2	LAST	329	06,2345	0 3462 1		TC	DRIFTSUB	-(NBDY)(DELTAT) (GYRC PULSES) X 2(+14)
01489	REF	1			06,2346	0 2416 1		TC	IRIGZ	COMPENSATE ACCELERATION TERMS
0149	REF	1			06,2347	3 1462 0		CA	NBDZ	(GYRC PULSES)/(CS) X 2(-5)
01491	REF	3	LAST	329	06,2350	0 3462 1		TC	DRIFTSUB	+(NBDZ)(DELTAT) (GYRC PULSES) X 2(+14)
01492	REF	2	LAST	329	06,2351	11'477 0		CCS	GCOMP SW	ARE GYRC COMMANDS GREATER THAN 2 PULSES
01493					06,2352	1 3354 1		TCF	+2	YES SEND OUT GYRC TORGLING COMMANDS.
01494	REF	2	LAST	327	06,2353	1 3361 1		TCF	IPIGI	NO RETURN
01495	REF	1			06,2354	3 5031 0		CA	PRIG21	PRIG GREATER THAN SERVICE
01496	REF	4	LAST	260	06,2355	0 5072 1		TC	NOVAC	SEND OUT GYRC TORGLING COMMANDS.
01497	REF	3	LAST	329	06,2356	03515 0		FRANK=	NBDX	
01498	REF	1			06,2357	14763 1		2CADP	1/GYRC	
01499					06,2360	0 2003 1		RELINT		
015	REF	2	LAST	327	06,2361	3 0163 0	IPIG1	CA	MODE	RESTORE CALLEPS FBANK
01501	REF	9	LAST	327	06,2362	54 003 0		TS	FRANK	
01502	REF	2	LAST	244	06,2363	1 4621 0		TCF	SWRETURN	

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0151					06,3364	0 0006 1	IFIGX	EXTEND		
01511	REF	44	LAST	325	06,3365	22 156 0		QXCH	MPAC +2	SAVE G
01512					06,3366	0 0006 1		EXTEND		
0152	REF	5	LAST	327	06,3367	4 0325 1		DCS	DELVX	(PIPA PULSES) X 2(+14)
0153	REF	45	LAST	330	06,3370	52 155 1		DXCH	MPAC	
0154	REF	1			06,3371	3 1463 1		CA	ADIAX	(GYRO PULSES)/(PIPA PLLSE) X 2(-6) *
0155	REF	1			06,3372	0 3433 0		TC	GCOMPSUB	-(ADIAX)(PIPAY) (GYRO PULSES) X 2(+14)
0156					06,3373	0 0006 1		EXTEND		
0157	REF	1			06,3374	4 0327 0		DCS	DELVY	(PIPA PULSES) X 2(+14)
0158	REF	46	LAST	330	06,3375	52 155 1		DXCH	MPAC	
0159	REF	1			06,3376	4 1466 0		CS	ADSPAX	(GYRO PULSES)/(PIPA PLLSE) X 2(-6) *
0160	REF	2	LAST	330	06,3377	0 3433 0		TC	GCOMPSUB	+(ADSPAX)(PIPAY) (GYRO PULSES) X 2(+14)
A01603								EXTEND		***
A01604								DCS	DELVZ	*** (PIPA PULSES) X 2(+14)
A01605								DXCH	MPAC	***
A01606								CA	ADCAAX	*** (GYRO PULSES)/(PIPA PLLSE) X 2(-6) *
A01607								TC	GCOMPSUB	*** -(ADCAAX)(PIPAZ) (GYRO PULSES) X 2(+14)
0161	REF	47	LAST	330	06,3400	0 0156 0		TC	MPAC +2	
0163					06,3401	0 0006 1	IFIGY	EXTEND		
01631	REF	48	LAST	330	06,3402	22 156 0		QXCH	MPAC +2	SAVE G
01632					06,3403	0 0006 1		EXTEND		
0164	REF	2	LAST	330	06,3404	4 0327 0		DCS	DELVY	(PIPA PULSES) X 2(+14)
0165	REF	49	LAST	330	06,3405	52 155 1		DXCH	MPAC	
0166	REF	1			06,3406	3 1464 0		CA	ADIAY	(GYRO PULSES)/(PIPA PLLSE) X 2(-6) *
0167	REF	3	LAST	330	06,3407	0 2433 0		TC	GCOMPSUB	-(ADIAY)(PIPAY) (GYRO PULSES) X 2(+14)
0168					06,3410	0 0006 1		EXTEND		
0169	REF	1			06,3411	4 0331 1		DCS	DELVZ	(PIPA PULSES) X 2(+14)
0170	REF	50	LAST	330	06,3412	52 155 1		DXCH	MPAC	
0171	REF	1			06,3413	4 1467 1		CS	ADSPAY	(GYRO PULSES)/(PIPA PLLSE) X 2(-6) *
0172	REF	4	LAST	330	06,3414	0 3433 0		TC	GCOMPSUB	+(ADSPAY)(PIPAZ) (GYRO PULSES) X 2(+14)
A01723								EXTEND		***
A01724								DCS	DELVX	*** (PIPA PULSES) X 2(+14)
A01725								DXCH	MPAC	***
A01726								CA	ADCAAY	*** (GYRO PULSES)/(PIPA PLLSE) X 2(-6) *
A01727								TC	GCOMPSUB	*** -(ADCAAY)(PIPAY) (GYRO PULSES) X 2(+14)
0173	REF	51	LAST	330	06,3415	0 0156 0		TC	MPAC +2	
0175					06,3416	0 0006 1	IRIGZ	EXTEND		
01751	REF	52	LAST	330	06,3417	22 156 0		QXCH	MPAC +2	SAVE G
01752					06,3420	0 0006 1		EXTEND		
0176	REF	3	LAST	330	06,3421	4 0327 0		DCS	DELVY	(PIPA PULSES) X 2(+14)
0177	REF	53	LAST	330	06,3422	52 155 1		DXCH	MPAC	
0178	REF	1			06,3423	3 1470 0		CA	ADSPAZ	(GYRO PULSES)/(PIPA PLLSE) X 2(-6) *

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0179	REF	5	LAST	330	06,2424	0 3433 0	TC	GCOMP SUB	-(ACSPAZ)(PIPAY) (GYRO PULSES) X 2(+14)
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0180					06,3425	0 3436 1			
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0181	REF	2	LAST	330	06,3426	4 0331 1	CCS	DEL VZ	(PIPA PULSES) X 2(+14)
------	-----	---	------	-----	---------	----------	-----	--------	------------------------

0182	REF	54	LAST	330	06,3427	52 155 1	DXCH	MPAC	
------	-----	----	------	-----	---------	----------	------	------	--

0183	REF	1			06,3430	3 1465 1	CA	ADIAZ	(GYRO PULSES)/(PIPA PULSE) X 2(-6) *
------	-----	---	--	--	---------	----------	----	-------	--------------------------------------

0184	REF	6	LAST	331	06,3431	0 3433 0	TC	GCOMP SUB	-(ADIAZ)(PIPAZ) (GYRO PULSES) X 2(+14)
------	-----	---	------	-----	---------	----------	----	-----------	--

A01843							EXTEND		***
--------	--	--	--	--	--	--	--------	--	-----

A01844							CCS	DEL VZ	*** (PIPA PULSE) X 2(+14)
--------	--	--	--	--	--	--	-----	--------	---------------------------

A01845							DXCH	MPAC	***
--------	--	--	--	--	--	--	------	------	-----

A01846							CS	ADIAZ	*** (GYRO PULSES)/(PIPA PULSE) X 2(-6) *
--------	--	--	--	--	--	--	----	-------	--

A01847							TC	GCOMP SUB	*** +(ADIAZ)(PIPAZ) (GYRO PULSES) X 2(+14)
--------	--	--	--	--	--	--	----	-----------	--

0185	REF	55	LAST	331	06,3432	0 0156 0	TC	MPAC +2	
------	-----	----	------	-----	---------	----------	----	---------	--

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0199	REF	56	LAST	331	06,3433	56 154 1	CCOMPSLB	XCF	MPAC	ADIA CR ADSRA COEFFICIENT ARRIVES IN A
0200					06,3434	0 0006 1		EXTEND		C(MPAC) = (PIPA PULSES) X 2(+14)
0201	REF	57	LAST	332	06,3435	7 0154 0		MP	MPAC	(CYRC PULSES)/(PIPA PULSE) X 2(-6) *
0202	REF	18	LAST	98	06,3436	52 123 0		EXCF	VBUF	NOW = (CYRC PULSES) X 2(+8) *
0203	REF	58	LAST	332	06,3437	3 0155 0		CA	MPAC +1	MINOR PART PIPA PULSES
0204					06,3440	0 0006 1		EXTEND		
0205	REF	59	LAST	332	06,3441	7 0154 0		MP	MPAC	ADIA OR ADSRA
0206	REF	27	LAST	327	06,3442	54 001 1		TS	L	
0207	REF	32	LAST	299	06,3443	3 4755 1		CAF	ZERO	
0208	REF	19	LAST	332	06,3444	20 123 0		LAS	VBUF	NOW = (CYRC PULSES) X 2(+8) *
0209	REF	20	LAST	332	06,3445	3 0122 0		CA	VBUF	PARTIAL RESULT - MAJOR
0210					06,3446	0 0006 1		EXTEND		
0211	REF	16	LAST	246	06,3447	7 4743 1		MP	BIT9	SCALE 2(+6) SHIFT RIGHT 6 *
0212	REF	18	LAST	329	06,3451	50 123 0		INDEX	BLF	RESULT = (CYRC PULSES) X 2(+14)
0213	REF	3	LAST	111	06,3451	21 472 0		LAS	GCMP	HI(ADIA)(PIPAI) CR HI(ADSRA)(PIPAI)
0214	REF	21	LAST	332	06,3452	3 0123 1		CA	VBUF +1	PARTIAL RESULT - MINOR
0215					06,3453	0 0006 1		EXTEND		
0216	REF	17	LAST	332	06,3454	7 4743 1		MP	BIT9	SCALE 2(+6) SHIFT RIGHT 6 *
0217	REF	28	LAST	332	06,3455	54 001 1		TS	L	
0218	REF	33	LAST	332	06,3456	3 4755 1		CAF	ZERO	
0219	REF	19	LAST	332	06,3457	50 130 0		INDEX	BLF	RESULT = (CYRC PULSES) X 2(+14)
0220	REF	4	LAST	332	06,3460	21 472 0		DAS	GCMP	(ADIA)(PIPAI) CR (ADSRA)(PIPAI)
0221	REF	32	LAST	327	06,3461	0 0002 0		TC	C	

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0222					06,3462	0 0006 I	DRIFTSUB	EXTEND		
0223	REF	21	LAST	332	06,3463	22 131 1		EXCH	BLF +1	
0224					06,3464	0 0006 I		EXTEND		
0225	REF	3	LAST	327	06,3465	7 1074 1		MP	1/PIPA2	$C(A) = AFD \quad (GYRC \text{ PULSES}) / (CS) \times 2(-5)$
0226	REF	60	LAST	332	06,3466	22 155 0		LXCH	MPAC +1	$(CS) \times 2(+5) \quad NOW \quad (GYRC \text{ PULSES}) \times 2(+3)$
0227					06,3467	0 0006 I		EXTEND		SAVE FOR FRACTIONAL COMPENSATION
0228	REF	19	LAST	254	06,3470	7 4750 0		MP	BIT4	SCALE 2(+11) SHIFT RIGHT 11
0229	REF	21	LAST	332	06,3471	50 130 0		INDEX	BLF	
0230	REF	5	LAST	332	06,3472	21 472 0		DAS	GCOMP	$HI(ABD)(DELTA) \quad (GYRC \text{ PULSES}) \times 2(+14)$
0231	REF	41	LAST	332	06,3473	2 0155 0		CA	MPAC +1	NEW MINCE PART
0232					06,3474	0 0006 I		EXTEND		
0233	REF	20	LAST	332	06,3475	7 4750 0		MP	BIT4	SCALE 2(+11) SHIFT RIGHT 11
0234	REF	29	LAST	332	06,3476	54 001 1		TS	L	
0235	REF	34	LAST	332	06,3477	3 4755 1		CAF	ZERO	
0236	REF	22	LAST	332	06,3500	50 130 0		INDEX	BLF	ADD IN FRACTIONAL COMPENSATION
0237	REF	6	LAST	332	06,3501	21 472 0		DAS	GCOMP	$(ABD)(DELTA) \quad (GYRC \text{ PULSES}) \times 2(+14)$
0238	REF	12	LAST	305	06,3512	3 4752 0	DRIFTSUB2	CAF	TWO	PIPA1, PIPAY, PIPAZ
0239	REF	23	LAST	332	06,3513	6 0130 0		AC	BLF	
0240	REF	24	LAST	332	06,3514	56 130 0		EXCH	BLF	
0241	REF	54	LAST	324	06,3515	50 000 1		INDEX	A	
0242	REF	7	LAST	332	06,3516	11 471 0		CCS	GCOMP	ARE GYRC COMMANDS 1 PULSE OR GREATER
0243					06,3517	1 3511 0		TCF	+2	YES
0244	REF	25	LAST	332	06,3518	0 0131 1		TC	BLF +1	NO
0245	REF	1			06,3511	7 3561 1		MASK	COMPCHK	FFC -1
0246	REF	95	LAST	332	06,3512	10 000 0		CCS	A	ARE GYRC COMMANDS GREATER THAN 2 PULSES
0247	REF	4	LAST	329	06,3513	55 477 0		TS	GCOMP SW	YES - SET GCOMP SW POSITIVE
0248	REF	26	LAST	332	06,3514	0 0131 1		TC	BLF +1	NO

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0249	REF	5	LAST	327	06,3515	3 4751 0	1/GYRC	CAF	FOUR	PIPAZ, PIPAY, PIPAX
0250	REF	27	LAST	333	06,3516	54 130 1		TS	BLF	
0251	REF	28	LAST	334	06,3517	50 130 0		INDEX	BLF	SCALE CYRC COMMANDS FOR IMPULSE
0252	REF	8	LAST	333	06,3520	3 1472 1		CA	GCCMP +1	FRACTIONAL PULSES
0253					06,3521	0 0006 1		EXTEND		
0254	REF	21	LAST	280	06,3522	7 4744 0		MP	BIT8	SHIFT RIGHT 7
0255	REF	29	LAST	334	06,3523	50 130 0		INDEX	BLF	
0256	REF	5	LAST	334	06,3524	55 472 0		TS	GCCMP +1	FRACTIONAL PULSES SCALED
0257	REF	35	LAST	333	06,3525	3 4755 1		CAF	ZERC	SET GCCMP = 0 FOR DAS INSTRUCTION
0258	REF	30	LAST	334	06,3526	50 130 0		INDEX	BLF	
0259	REF	10	LAST	334	06,3527	57 471 1		XCF	GCCMP	CYRC PULSES
0260					06,3531	0 0006 1		EXTEND		
0261	REF	22	LAST	334	06,3531	7 4744 0		MP	BIT8	SHIFT RIGHT 7
0262	REF	31	LAST	334	06,3532	50 130 0		INDEX	BLF	
0263	REF	11	LAST	334	06,3533	21 472 0		DAS	GCCMP	ADD THESE TO FRACTIONAL PULSES ABOVE
0264	REF	32	LAST	334	06,3534	10 130 1		CCS	BUF	PIPAZ, PIPAY, PIPAX
0265	REF	2	LAST	327	06,3535	6 7752 0		AD	NEG1	
0266	REF	2	LAST	329	06,3536	1 3516 1		TCF	1/GYRC +1	
0267	REF	12	LAST	334	06,3537	0 1471 1	LGCCMP	ECAER	GCCMP	LESS THAN ZERC IMPOSSIBLE
0268	REF	2	LAST	327	06,3540	3 3537 0		CAF	LGCCMP	
0269	REF	58	LAST	301	06,3541	0 4616 1		TC	BANKCALL	
0270	REF	2	LAST	274	06,3542	17315 0		CADR	IMPULSE	CALL CYRC TOPGUING ROUTINE
0271	REF	59	LAST	334	06,3543	0 4616 1		TC	BANKCALL	
0272	REF	6	LAST	274	06,3544	17710 1		CAEF	IMUSTALL	WAIT FOR PULSES TO GET CUT
0273	REF	24	LAST	300	06,3545	1 5155 1		TCF	ENDOFJOB	TEMPORARY
0274	REF	6	LAST	334	06,3546	3 4751 0	GCCMP1	CAF	FOUR	PIPAZ, PIPAY, PIPAX
0275	REF	33	LAST	334	06,3547	54 130 1		TS	BLF	
0276	REF	34	LAST	334	06,3550	50 130 0		INDEX	BLF	RESCALE
0277	REF	13	LAST	334	06,3551	3 1472 1		CA	GCCMP +1	
0278					06,3552	0 0006 1		EXTEND		
0279	REF	23	LAST	334	06,3553	7 4744 0		MP	BIT8	SHIFT MINOR PART LEFT 7 - MAJOR PART = 0
0280	REF	35	LAST	334	06,3554	50 130 0		INDEX	BUF	
0281	REF	14	LAST	334	06,3555	23 472 1		LXCH	GCCMP +1	BITS 8-14 OF MINOR PART WERE = 0
0282	REF	36	LAST	334	06,3556	10 130 1		CCS	BLF	PIPAZ, PIPAY, PIPAX
0283	REF	3	LAST	334	06,3557	6 7752 0		AD	NEC1	
0284	REF	1			06,3560	1 3547 0		TCF	GCCMP1 +1	
0285					06,3561	77776 1	CCMPCHK	DEC	-1	LESS THAN ZERC IMPOSSIBLE
0286	REF	25	LAST	334	06,3562	1 5155 1		TCF	ENDOFJOB	

L TM1 COMPENSATION RACKAGE

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0287	RFF	5	LAST	333	06,353	11,477 0	NEEDLY	CCS	GCOMP SW	BYPASS IF GCOMP SW NEGATIVE
0288					06,3564	1 3567 1		TCF	+3	
0289					06,3565	1 3567 1		TCF	+2	
0290	RFF	26	LAST	334	06,3566	1 5155 1		TCF	END OF JOB	
029005					06,3567	0 0004 0		INHINT		
02901	RFF	6	LAST	230	06,357	10 076 1		CCS	FLAG WP2	PREPARED TRUPT MAY COINCIDE
02902	RFF	27	LAST	335	06,3571	1 5155 1		TCF	END OF JOB	
02903	RFF	28	LAST	335	06,3572	1 5155 1		TCF	END OF JOB	
02904					06,3573	1 3574 0		TCF	+1	
02905	RFF	3	LAST	298	06,3574	3 0154 1		CA	FLAG WP4	IF SURFACE FLAG IS SET, SET TEM1
02906	RFF	24	LAST	334	06,3575	7 4744 0		MASK	BITR	POSITIVE SO THAT THE ACCELERATION TERMS
02907	RFF	4	LAST	98	06,3576	54 141 1		TS	TEM1	WILL BE COMPENSATED.
02908					06,3577	0 0006 1		EXTEND		
0291					06,3578	1 3613 0		BZF	+3	ARE WE ON THE SURFACE
0292	RFF	16	LAST	296	06,3611	0 4674 0		TC	IPKCALL	ON THE SURFACE
02925	RFF	1			06,3612	7 7541 1		CADR	PIPAS +3	READ PIPAS, BUT DO NOT SCALE THEM
0293	RFF	2	LAST	166	06,3613	3 0025 1		CA	TIME1	(CS) X 2(+14)
0294	RFF	4	LAST	333	06,3614	5 71074 0		XCH	1/PIPACT	PREVIOUS TIME
0295					06,3615	0 0003 1		RELINT		
0296					06,3616	4 0000 0		CCM		
0297	RFF	5	LAST	335	06,3617	6 1074 0		AD	1/PIPACT	PRESENT TIME - PREVIOUS TIME
0298	RFF	1			06,3618	6 4736 1	NFC2	AC	HALF	CORRECT FOR POSSIBLE TIME1 TICK
0299	RFF	2	LAST	335	06,3619	6 4736 1		AC	HALF	
0300	RFF	30	LAST	333	06,3612	56 001 0		XCH	L	IF TIME1 DID NOT TICK, REMOVE RESULTING
0301	RFF	31	LAST	335	06,3613	56 001 0		XCH	L	OVERFLOW.
0302					06,3614	0 0006 1	NBDX	EXTEND		C(A) = CELTAT (CS) X 2(+14)
0303	RFF	18	LAST	255	06,3615	7 4742 0		MP	BIT11	SHIFT RIGHT 5
0304	RFF	22	LAST	232	06,3616	52 125 0		EXCH	VRUF +2	
03041	RFF	36	LAST	334	06,3617	3 4755 1		CA	ZERO	
03042	RFF	6	LAST	335	06,3620	55,477 0		TS	GCOMP SW	INDICATE COMMANDS 2 PULSES OR LESS.
03043	RFF	27	LAST	334	06,3621	54 120 1		TS	RUF	INDEX X, Y, Z.
03044	RFF	5	LAST	335	06,3622	10 141 1		CCS	TEM1	IF SURFACE FLAG IS SET,
03045	RFF	2	LAST	329	06,3623	0 3364 0		TC	IRIGX	COMPENSATE ACCELERATION TERMS.
0305					06,3624	0 0006 1		EXTEND		
0306	RFF	23	LAST	335	06,3625	3 0125 1		ECA	VRUF +2	
0307	RFF	62	LAST	333	06,3626	52 155 1		EXCH	MPAC	CELTAT NOW SCALED (CS) X 2(+19)
0311	RFF	4	LAST	329	06,3627	4 146 0		CS	NBDX	(GYPC PLSSES)/(CS) X 2(-5)
0312	RFF	1			06,3630	0 3652 0		TC	FBIASSUB	-(NBDX)(CELTAT) (GYPC PLSSES) X 2(+14)
03121	RFF	6	LAST	335	06,3631	10 141 1		CCS	TEM1	IF SURFACE FLAG IS SET,
03122	RFF	2	LAST	329	06,3632	0 3411 1		TC	IRIGY	COMPENSATE ACCELERATION TERMS.

L IML COMPENSATION PACKAGE

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0313					06,3633	0	0006	1	EXTEND		
0314	REF	24	LAST	335	06,3634	4	0125	0	DCS	VELF +2	
0315	REF	63	LAST	335	06,3635	52	155	1	EXCH	MPAC	DELTAT SCALED (CS) X 2(+19)
0316	REF	2	LAST	329	06,3636	3	1461	0	CA	NBDY	(GYRC PULSES)/(CS) X 2(-5)
0317	REF	2	LAST	335	06,3637	0	3652	0	TC	FBIASSUB	-(NBDY)(DELTAT) (GYRC PULSES) X 2(+14)
03171	REF	7	LAST	335	06,3640	10	141	1	CCS	TEM1	IF SURFACE FLAG IS SET,
03172	REF	2	LAST	329	06,3641	0	3416	1	TC	IRIGZ	COMPENSATE ACCELERATION TERMS
0318					06,3642	0	0006	1	EXTEND		
0319	REF	25	LAST	336	06,3643	4	0125	0	DCS	VELF +2	
0320	REF	64	LAST	336	06,3644	52	155	1	EXCH	MPAC	DELTAT SCALED (CS) X 2(+19)
0321	REF	2	LAST	329	06,3645	4	1462	1	CS	NBDZ	(GYRC PULSES)/(CS) X 2(-5)
0322	REF	3	LAST	336	06,3646	0	3652	0	TC	FBIASSUB	+(NBDZ)(DELTAT) (GYRC PULSES) X 2(+14)
0323	REF	7	LAST	335	06,3647	11	477	0	CCS	GCOMPSW	ARE GYRC COMMANDS GREATER THAN 2 PULSES
0324	REF	3	LAST	334	06,3650	1	3515	1	TCF	1/GYRC	YES
0325	REF	29	LAST	335	06,3651	1	5155	1	TCF	ENDOFJOB	NO

L IMC COMPENSATION PACKAGE

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0326	RFF	33	LAST	332	06,3652	56 002 0	FRTASSLB	XCH	G	
0327	RFF	38	LAST	335	06,3653	54 131 0		TS	RUF +1	
0328	RFF	34	LAST	337	06,3654	3 0002 0		CA	G	NEE SCALED (CYRC PULSES)/(CS) X 2(-5)
0329					06,3655	3 0006 1		EXTEND		
0330	RFF	65	LAST	336	06,3656	7 0154 0		MP	MPAC	DELTA T SCALED (CS) X 2(+15)
0331	RFF	39	LAST	337	06,3657	50 130 0		INDEX	BLF	
0332	RFF	15	LAST	334	06,3660	21'472 0		CAS	GCOMP	HI(MRD)(DELTA T) (GYRC PULSES) X 2(+14)
0333	RFF	25	LAST	337	06,3661	3 0002 0		CA	G	NEW FRACTIONAL PART
0334					06,3662	3 0006 1		EXTEND		
0335	RFF	66	LAST	337	06,3663	7 0155 1		MP	MPAC +1	
0336	RFF	32	LAST	335	06,3664	54 001 1		TS	1	
0337	RFF	37	LAST	335	06,3665	3 4755 1		CAF	ZERO	
0338	RFF	41	LAST	337	06,3666	50 130 0		INDEX	BLF	
0339	RFF	16	LAST	337	06,3667	21'472 0		CAS	GCOMP	(MRD)(DELTA T) (GYRC PULSES) X 2(+14)
0340	RFF	1			06,3670	1 3502 1		TCF	DRFTSUP2	CHECK MAGNITUDE OF COMPENSATION
0341	RFF	60	LAST	334	06,3671	0 4616 1	LASTRIAS	TC	BANKCALL	
03411	RFF	1			06,3672	17271 0		CADR	PIPUSE1	
03412	RFF	8	LAST	336	06,3673	11'477 0		CCS	GCOMP SW	
0342					06,3674	1 2677 0		TCF	+3	
0343					06,3675	1 3677 0		TCF	+2	
0344	RFF	30	LAST	336	06,3676	1 5155 1		TCF	ENDCFJCB	
03441	RFF	4	LAST	335	06,3677	3 0104 1		CA	FLAGWDR	IF SURFACE FLAG IS SET, SET TEMP
03442	RFF	2	LAST	298	06,3700	7 4744 0		MASK	SURFEIT	POSITIVE SO THAT THE ACCELERATION TERMS
03443	RFF	8	LAST	336	06,3701	54 141 1		TS	TEMP	WILL BE COMPENSATED.
0345	RFF	1			06,3702	3 7721 1		CAF	PRIO31	2 SECONDS SCALED (CS) X 2(+8)
0346	RFF	6	LAST	335	06,3703	57'074 0		XCH	1/PFACT	
0347					06,3704	4 0000 0		CCM		
0348	RFF	3	LAST	321	06,3705	6 1234 0		AD	PIPTIME +1	
0349	RFF	1			06,3706	1 3610 1		TCF	NP02	
0350	RFF	3	LAST	334	06,3707	3 3537 1	GCOMPZER	CAF	LGCOMP	ROUTINE TO ZERO GCOMP BEFORE FIRST
0351	RFF	10	LAST	329	06,3710	56 103 1		XCH	EPANK	CALL TO 1/PTPA
0352	RFF	2	LAST	329	06,3711	54 163 1		TS	MODE	
0353	RFF	38	LAST	337	06,3712	3 4755 1		CAF	ZERO	
0354	RFF	9	LAST	337	06,3713	55'477 0		TS	GCOMP SW	
0355	RFF	17	LAST	337	06,3714	55'471 0		TS	GCOMP	
0356	RFF	18	LAST	337	06,3715	55'472 0		TS	GCOMP +1	
0357	RFF	19	LAST	337	06,3716	55'473 1		TS	GCOMP +2	
0358	RFF	20	LAST	337	06,3717	55'474 0		TS	GCOMP +3	
0359	RFF	21	LAST	337	06,3720	55'475 1		TS	GCOMP +4	

L IMU COMPENSATION PACKAGE

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0360 REF 22 LAST 337 06,3721 55'476 1 TS GCOMP +5

0361 REF 3 LAST 329 06,3722 1 3361 1 TCF IFIG1 RESTORE FBANK AND RETURN

L R62:

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R0010 SUBROUTINE NAME: V09CALL
R0011 MOD NO: 1 DATE: 9 JAN 1968
R0012 MOD BY: DIGITAL DEVEL GROUP LCS SECTION: R63

R0013 FUNCTIONAL DESCRIPTION:

R0014 CALLED BY V09 ENTER DURING P01. PRIOR TO USER. CALCULATES AND
R0015 DISPLAYS FINAL F041 BALL ANGLES TO POINT LM +X OR +Z AXES AT CSM.

R0016 1. KEY IN V 09 F ONLY IF IN PROG 01. IF NOT IN P00, OPERATOR ERROR AND
R0017 EXIT R62, OTHERWISE CONTINUE.

R0018 2. IF IN P00, DO IMU STATUS CHECK ROUTINE (R02P0TH). IF IMU ON AND ITS
R0019 ORIENTATION KNOWN TO LCC, CONTINUE.

R0020 3. FLASH DISPLAY V 04 N 06. P2 INDICATES WHICH SPACECRAFT AXIS IS TO
R0021 BE POINTED AT CSM. INITIAL CHOICE IS PREFERRED (+Z) AXIS (R2=1).
R0022 ASTRONAUT CAN CHANGE TO (+X) AXIS (R2 NOT = 1) BY V 22 F 2 F. CONTINUE
R0023 AFTER KEYING IN PREFERRED.

R0024 4. BOTH VEHICLE STATE VECTORS UPDATED BY CONIC EGS.

R0025 5. HALF MAGNITUDE UNIT LCS VECTOR (IN STABLE MEMBER COORDINATES) AND
R0026 HALF MAGNITUDE UNIT SPACECRAFT AXIS VECTOR (IN BODY COORDINATES)
R0027 PREPARED FOR VECPOINT.

R0028 6. GIMBAL ANGLES FROM VECPOINT TRANSFERRED INTO F041 BALL ANGLES BY
R0029 BALLANGS. FLASH DISPLAY V 06 N 19 AND AWAIT RESPONSE.

R0030 7. RECYCLE - RETURN TO STEP 4.
R0031 TERMINATE - EXIT R62.
R0032 RECCED - RESET 3AXISFLG AND CALL R60LEM FOR ATTITUDE MANEUVER.

R0033 CALLING SEQUENCE: V 09 F.

R0034 SUBROUTINES CALLED: CHECKP0H, R02B0TH, GOXDSPE, CSMCONIC, LEMCONIC,
R0035 VECPOINT, BALLANGS, R60LEM.

R0036 NORMAL EXIT MODES: TO ENDCXT

R0037 ALARMS: 1. OPERATOR ERROR IF NOT IN P00.
R0038 2. PROGRAM ALARM IF IMU IS OFF.
R0039 3. PROGRAM ALARM IF IMU ORIENTATION IS UNKNOWN.

R0040 FLTPUT: NONE

R0041 ERASABLE INITIALIZATION REQUIRED: NONE

R0042 CUBOIS: OPTICN1, +1, TO C1, POINTVSH, SCAXIS, CPFI, CTHETA, CPSI,

L P63

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P0043 3AXISFLG.

0044 RFF 4 LAST 285 F4,1606 EBANK= RCNE
 0045 32,2217 BANK 32
 0046 RFF 1 26,2000 SETLCC BAWLANGS
 0047 26,2022 BANK

0048 RFF 1 COUNT# 11/P63
 0049 RFF 61 LAST 337 26,2022 0 4616 1 V89CALL TC BANKCALL IML STATUS CHECK. RETURNS IF ORIENTATION
 0050 RFF 1 26,2023 11236 0 CADR R02BCTH KNOWN. ALARMS IF NOT.
 0051 RFF 3 LAST 295 26,2024 3 6250 0 CAF THFFF ALLOW ASTRONAUT TO SELECT DESIRED
 0052 RFF 8 LAST 306 26,2025 55 0050 1 TS OPTIONX TRACKING ATTITUDE AXIS.
 0053 RFF 15 LAST 305 26,2026 3 4753 1 CAF CNE
 0054 RFF 9 LAST 340 26,2027 55 051 0 TS OPTICX +1
 0055 RFF 1 26,2030 3 2117 1 CAF VB04N12 V 04 N 12
 0056 RFF 62 LAST 340 26,2031 0 4616 1 TC BANKCALL
 0057 RFF 2 LAST 226 26,2032 20477 1 CADR GCFLASH
 0058 RFF 26 LAST 301 26,2033 0 5472 0 TC ENEXT TERMINATE
 0059 26,2034 0 2036 0 TC +2 PROCEED
 0060 26,2035 0 2030 0 TC -5 DATA IN. OPTICX+1 = 1 FOR Z AXIS
 0061 RFF 11 LAST 324 26,2036 0 6042 1 V89RECL TC INTERPRET = 2 FOR X AXIS
 0062 26,2037 43234 0 RTB DAD
 0063 RFF 2 LAST 208 26,2040 21574 1 LOADTIME READ PRESENT TIME
 00635 RFF 1 26,2041 14122 0 DP1MIN
 0064 RFF 1 26,2042 02205 1 STORE TSTART82 SAVE TIME FOR LEMCCNIC CALL
 0065 RFF 4 LAST 237 26,2043 34041 0 STCALL TDEC1 STORE TIME FOR CSMCCNIC CALL
 0066 RFF 1 26,2044 27067 0 CSMCCNIC CSM STATE VECTOR UPDATE
 0067 26,2045 77775 1 VLCD CSMCCNIC LEFT R VECTOR IN RATT
 0068 RFF 1 26,2046 00001 0 RATT
 0069 RFF 5 LAST 340 26,2047 16207 0 STCDL RCNE SAVE FOR LINE OF SIGHT (LCS) COMPUTATION
 0070 RFF 2 LAST 340 26,2050 02205 1 TSTART82
 0071 RFF 5 LAST 340 26,2051 34041 0 STCALL TDEC1 STORE TIME FOR LEMCCNIC CALL
 0072 RFF 1 26,2052 27101 1 LEMCCNIC LEM STATE VECTOR UPDATE
 0073 26,2053 52375 1 VLCD VSU CSM POSITION - LEM POSITION = LCS
 0074 RFF 6 LAST 340 26,2054 02207 0 RCNE LCS VECTOR LEFT IN MPAC
 0075 RFF 2 LAST 340 26,2055 00001 0 RATT
 0076 26,2056 47121 0 MXV RTB (REFSMAT X LCS). TRANSFORMS LCS FROM
 0077 RFF 6 LAST 210 26,2057 01734 0 REFSMAT REFERENCE CCCRD TO STATE MEMB CCORD.
 00771 RFF 1 26,2060 21727 0 NORMUNIT
 0078 RFF 2 LAST 153 26,2061 03773 1 STORE PCINTVSM STORE LCS FOR VECPOINT CALL
 0079 26,2062 77776 1 EXIT
 0080 RFF 10 LAST 340 26,2063 4 1051 0 CS OPTIONX +1 1 FOR Z AXIS. 2 FOR X AXIS.
 0081 RFF 16 LAST 340 26,2064 6 4753 1 AD CNE
 0082 26,2065 0 0006 1 EXTEND
 0083 RFF 1 26,2066 1 2113 1 BZF ALINEZ
 0084 RFF 12 LAST 340 26,2067 0 6042 1 ALINEX TC INTERPRET X AXIS ALIGNMENT
 0085 26,2070 77775 1 VLCD
 0086 RFF 4 LAST 300 26,2071 06522 1 UNITX READ (.5, 0, 0)

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0087	REF	11	LAST	251	26,2172	37765 1	V89CALL1	STCALL	SCAXIS	STORE SELECTED ALIGNMENT AXIS
0088	REF	1			26,2072	56040 0			VECPCTAT	PUTS DESIRED C1M ANG (CG,1C,MG) IN TMPAC
0089	REF	1			26,2174	01322 1		STORE	GPHI	STORE GIMBAL ANGLES FOR BALLANGS CALL.
0090					26,2075	77776 1		EXIT		
00915	REF	63	LAST	340	26,2076	04616 1		TC	BANKCALL	
0091	REF	1			26,2077	54272 1		CADR	BALLANGS	PLTS DESIRED BALL ANGLES IN FEAIX,Y,Z
0092	REF	1			26,2100	32120 0		CAF	VB06N18	V 06 N 18
0093	REF	64	LAST	341	26,2101	14616 1		TC	BANKCALL	NCUN 18 REFERS TO FEAIX,Y,Z
0094	REF	3	LAST	340	26,2112	21477 1		CADR	GOFASH	
0095	REF	27	LAST	340	26,2113	05472 0		TC	INDEXT	TERMINATE
0096					26,2114	02106 1		TC	+2	FRCFEC
0097	REF	1			26,2115	02036 0		TC	V89REFL	RECYCLE
0098	REF	3	LAST	299	26,2116	05516 0		TC	DCWNFLAG	RESET 3 AXIS FLAG
0099	REF	2	LAST	230	26,2107	00124 0		ADRES	3AXISFLG	RESET R176 FLAG WORD 5
0100	REF	65	LAST	341	26,2110	04616 1		TC	BANKCALL	PERFORMS LEM MANUEVER TO ALIGN SELECTED
0101	REF	1			26,2111	54123 0		CADR	R6CLEM	SPACECRAFT AXIS TO CSM.
0102	REF	28	LAST	341	26,2112	15472 1		TCF	INDEXT	TERMINATE R63
0103	REF	13	LAST	340	26,2113	06042 1	ALINEZ	TC	INTERPT	Z AXIS ALIGNMENT
0104					26,2114	52175 0		VLOAD	GCTC	
0105	REF	4	LAST	300	26,2115	06516 0			UNITZ	READ (C, C, .5)
0106	REF	1			26,2116	54072 0			V89CALL1	
0107					26,2117	01014 0	VP04N12	VN	412	
0108					26,2120	01422 1	VB06N18	VN	0618	

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01085	26,2121	00000 1	CFIMIN	2DEC	6000
01085	26,2122	1356C C			

L ATTITUDE MANEUVER POLTIME

LSFR'S PAGE NO. 1 EC 53

R0001 BLOCK 2 AGC ATTITUDE MANUEVER ROUTINE-KALCMANU

R0002 MOD 2 DATE 5/1/67 BY DON KEENE
R0003 PROGRAM DESCRIPTION

R0004 KALCMANU IS A ROUTINE WHICH GENERATES COMMANDS FOR THE LM GAP TO CHANGE THE ATTITUDE OF THE SPACECRAFT
R0006 DURING FREE FALL. IT IS DESIGNED TO MANUEVER THE SPACECRAFT FROM ITS INITIAL ORIENTATION TO SOME DESIRED
R0008 ORIENTATION SPECIFIED BY THE PROGRAM WHICH CALLS KALCMANU, AVOIDING GIMBAL LOCK IN THE PROCESS. IN THE
R0010 MOD 2 VERSION, THIS DESIRED ATTITUDE IS SPECIFIED BY A SET OF THREE COMMANDED CGL ANGLES STORED AS 2S COMPLEMENT
R0012 SINGLE PRECISION ANGLES IN THE THREE CONSECUTIVE LOCATIONS, CPHI, CTHETA, CPSI, WHERE

R0014 CPHI = COMMANDED OUTER GIMBAL ANGLE
R0015 CTHETA = COMMANDED INNER GIMBAL ANGLE
R0016 CPSI = COMMANDED MIDDLE GIMBAL ANGLE

R0017 WHEN POINTING A SPACECRAFT AXIS (E.I. X, Y, Z, THE ANT, THRUST AXIS, ETC) THE SUBROUTINE VECPCINT MAY BE
R0019 USED TO GENERATE THIS SET OF DESIRED CGL ANGLES (SEE DESCRIPTION IN R60) -
R0021 WITH THIS INFORMATION KALCMANU DETERMINES THE DIRECTION OF THE SINGLE EQUIVALENT ROTATION (CCF ALSO U) AND THE
R0023 MAGNITUDE OF THE ROTATION (AM) TO BRING THE S/C FROM ITS INITIAL ORIENTATION TO ITS FINAL ORIENTATION.
R0025 THIS DIRECTION REMAINS FIXED BOTH IN INERTIAL COORDINATES AND IN COMMANDED S/C AXES THROUGHOUT THE

R0027 -
R0028 MANUEVER. ONCE CCF AND AM HAVE BEEN DETERMINED, KALCMANU THEN EXAMINES THE MANUEVER TO SEE IF IT WILL BRING
R0030 -
R0031 THE S/C THROUGH GIMBAL LOCK. IF SO, CCF AND AM ARE READJUSTED SO THAT THE S/C WILL JUST SKIM THE GIMBAL
R0033 LOCK ZONE AND ALIGN THE X-AXIS. IN GENERAL A FINAL YAW ABOUT X WILL BE NECESSARY TO COMPLETE THE MANUEVER.
R0035 NEEDLESS TO SAY, NEITHER THE INITIAL NOR THE FINAL ORIENTATION CAN BE IN GIMBAL LOCK.

R0037 FOR PROPER ATTITUDE CONTROL THE DIGITAL AUTOPILOT MUST BE GIVEN AN ATTITUDE REFERENCE WHICH IT CAN TRACK.
R0038 KALCMANU DOES THIS BY GENERATING A REFERENCE OF DESIRED GIMBAL ANGLES (CDUX, CDUY, CDUZ) WHICH ARE UPDATED
R0040 EVERY ONE SECOND DURING THE MANUEVER. TO ACHIEVE A SMOOTHER SEQUENCE OF COMMANDS BETWEEN SUCCESSIVE UPDATES,
R0042 THE PROGRAM ALSO GENERATES A SET OF INCREMENTAL CGL ANGLES (DELCDL) TO BE ADDED TO CGL DESIRED BY THE DIGITAL
R0044 AUTOPILOT. KALCMANU ALSO CALCULATES THE COMPONENT MANUEVER RATES (OMEGAPD, OMEGAQD, OMEGARQD), WHICH CAN

R0048 -
R0049 BE DETERMINED SIMPLY BY MULTIPLYING CCF BY SOME SCALAR (ARATE) CORRESPONDING TO THE DESIRED ROTATIONAL RATE.
R0051

R0052 AUTOMATIC MANUEVERS ARE TIMED WITH THE HELP OF WAITLIST SO THAT AFTER A SPECIFIED INTERVAL THE Y AND Z
R0054 DESIRED RATES ARE SET TO ZERO AND THE DESIRED CGL ANGLES (CDUY, CDUZ) ARE SET EQUAL TO THE FINAL DESIRED CGL
R0056 ANGLES (CTHETA, CPSI). IF ANY YAW REMAINS DUE TO GIMBAL LOCK AVOIDANCE, THE FINAL YAW MANUEVER IS
R0058 CALCULATED AND THE DESIRED YAW RATE SET TO SOME FIXED VALUE (COLLRATE = + CR - 2 DEGREES PER SEC).
R0060 IN THIS CASE ONLY AN INCREMENTAL CDUX ANGLE (DELPROLL) IS SUPPLIED TO THE GAP. AT THE END OF THE YAW
R0062 MANUEVER OR IN THE EVENT THAT THERE WAS NO FINAL YAW, CDUX IS SET EQUAL TO CPHI AND THE X-AXIS DESIRED
R0064 RATE SET TO ZERO. THUS, UPON COMPLETION OF THE MANUEVER THE S/C WILL FINISH UP IN A LIMIT CYCLE ABOUT THE
R0066 DESIRED FINAL GIMBAL ANGLES.

R0067 PROGRAM LOGIC FLOW

R0069 KALCMANU IS CALLED AS A HIGH PRIORITY JOB WITH ENTRY POINTS AT KALCMAN3 AND VECPCINT. IT FIRST PICKS
R0070 UP THE CURRENT CGL ANGLES TO BE USED AS THE BASIS FOR ALL COMPUTATIONS INVOLVING THE INITIAL S/C ORIENTATION.

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R0072 IT THEN DETERMINES THE DIRECTION COSINE MATRICES RELATING BOTH THE INITIAL AND FINAL S/C ORIENTATION TO STABLE
 R0074 * * *
 R0076 MEMBER AXES (MIS, MFS). IT ALSO COMPUTES THE MATRIX RELATING FINAL S/C AXES TO INITIAL S/C AXES (MFI). THE
 R0078 ANGLE OF ROTATION (AM) IS THEN EXTRACTED FROM THIS MATRIX, AND TESTS ARE MADE TO DETERMINE IF
 R0080

R0081 A) AM LESS THAN .25 DEGREES (MINANG)
 R0082 B) AM GREATER THAN 170 DEGREES (MAXANG)

R0083 IF AM LESS THAN .25 DEGREES, NO COMPLICATED AUTOMATIC MANEUVERING IS NECESSARY. THEREFORE WE CAN SIMPLY
 R0085 SET CCL DESIRED EQUAL TO THE FINAL CCL DESIRED ANGLES AND TERMINATE THE JOB.

R0087
 R0088 IF AM IS GREATER THAN .25 DEGREES BUT LESS THAN 170 DEGREES, THE AXES OF THE SINGLE EQUIVALENT ROTATION
 R0090 - *

R0091 (CCF) IS EXTRACTED FROM THE SKEW SYMMETRIC COMPONENTS OF MFI. * *

R0093 IF AM GREATER THAN 170 DEGREES AN ALTERNATE METHOD EMPLOYING THE SYMMETRIC PART OF MFI (MFSYM) IS USED
 R0095 -
 R0096 TO DETERMINE CCF.

R0097 THE PROGRAM THEN CHECKS TO SEE IF THE MANEUVER AS COMPUTED WILL BRING THE S/C THROUGH GIMBAL LOCK. IF
 R0099 SO, A NEW MANEUVER IS CALCULATED WHICH WILL JUST SKIM THE GIMBAL LOCK ZONE AND ALIGN THE S/C X-AXIS. THIS
 R0101 METHOD ASSURES THAT THE ADDITIONAL MANEUVERING TO AVOID GIMBAL LOCK WILL BE KEPT TO A MINIMUM. SINCE A FINAL
 R0103 P AXIS YAW WILL BE NECESSARY, A SWITCH IS RESET (STATE SWITCH 31) TO ALLOW FOR THE COMPLETION OF THIS FINAL
 R0105 YAW.

R0106 AS STATED PREVIOUSLY KALCMANU GENERATES A SEQUENCE OF DESIRED GIMBAL ANGLES WHICH ARE UPDATED EVERY
 R0108 -
 R0110 SECOND. THIS IS ACCOMPLISHED BY A SMALL ROTATION OF THE DESIRED S/C FRAME ABOUT THE VECTOR CCF. THE NEW
 R0112 DESIRED REFERENCE MATRIX IS THEN,

R0113 * * *
 R0114 MIS = MIS DEL
 R0115 N+1 N

R0116 *
 R0117 WHERE DEL IS THE MATRIX CORRESPONDING TO THIS SMALL ROTATION. THE NEW CCL ANGLES CAN THEN BE EXTRACTED
 R0119 *
 R0120 FROM MIS.

R0121 AT THE BEGINNING OF THE MANEUVER THE AUTOPILOT DESIRED RATES (OMEGAPD, OMEGAQD, OMEGARQD) AND THE
 R0123 MANEUVER TIMINGS ARE ESTABLISHED. ON THE FIRST PASS AND ON ALL SUBSEQUENT UPDATES THE CCL DESIRED
 R0125 ANGLES ARE LOADED WITH THE APPROPRIATE VALUES AND THE INCREMENTAL CCL ANGLES ARE COMPUTED. THE ACC CLOCKS
 R0127 (TIME1 AND TIME2) ARE THEN CHECKED TO SEE IF THE MANEUVER WILL TERMINATE BEFORE THE NEXT UPDATE. IF
 R0129 NOT, KALCMANU CALLS FOR ANOTHER UPDATE (RUN AS A JOB WITH PRIORITY TBD) IN ONE SECOND. ANY DELAYS IN THIS
 R0131 CALLING SEQUENCE ARE AUTOMATICALLY COMPENSATED IN CALLING FOR THE NEXT UPDATE.
 R0133

R0134 IF IT IS FOUND THAT THE MANEUVER IS TO TERMINATE BEFORE THE NEXT UPDATE A ROUTINE IS CALLED (AS A WAIT-
 R0136 LIST TASK) TO STOP THE MANEUVER AT THE APPROPRIATE TIME AS EXPLAINED ABOVE.
 R0138

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R0139 CALLING SEQUENCE

R0140 IN ORDER TO PERFORM A KALCMANU SUPERVISED MANEUVER, THE COMMANDER GIMBAL ANGLES MUST BE PRECOMPUTED AND
 R0142 STORED IN LOCATIONS CPHI, CTHTA, CPST. THE USER'S PROGRAM MUST THEN CLEAR STATE SWITCH NO 33 TO ALLOW THE
 R0144 ATTITUDE MANEUVER ROUTINE TO PERFORM ANY FINAL F-AXIS YAW INCURRED BY AVOIDING GIMBAL LOCK. THE MANEUVER IS
 R0146 THEN INITIATED BY ESTABLISHING THE FOLLOWING EXECUTIVE JOB

R0147
 R0148 CAF PRIE XX *
 R0149 --
 R0150 INFINI
 R0151 TC FINDVAC
 R0152 PCADR KALCMAN3
 R0153 RELINT

R0154 THE USER'S PROGRAM MAY EITHER CONTINUE OR WAIT FOR THE TERMINATION OF THE MANEUVER. IF THE USER WISHES TO
 R0156 WAIT, HE MAY PUT HIS JOB TO SLEEP WITH THE FOLLOWING INSTRUCTIONS

R0157 I TC BANKCALL
 R0158 L+1 CADP ATTSTALL
 R0159 L+2 (PAD RETURN)
 R0160 L+3 (GOTO RETLPM)

R0161 UPON COMPLETION OF THE MANEUVER, THE PROGRAM WILL BE AWAKENED AT L+3 IF THE MANEUVER WAS COMPLETED
 R0163 SUCCESSFULLY, OR AT L+2 IF THE MANEUVER WAS ABORTED. THIS ABORT WOULD OCCUR IF THE INITIAL OR FINAL ATTITUDE
 R0165 WAS IN GIMBAL LOCK.

R0166 ***NOTA BENF*** IT IS ASSUMED THAT THE DESIRED MANEUVERING RATE (0.5, 2, 5, 10, DEG/SEC) HAS BEEN SELECTED BY
 R0168 KEYBOARD ENTRY PRIOR TO THE EXECUTION OF KALCMANU.

R0169 IT IS ALSO ASSUMED THAT THE AUTOPILOT IS IN THE AUTO MODE. IF THE MODE SWITCH IS CHANGED DURING THE
 R0171 MANEUVER, KALCMANU WILL TERMINATE VIA CODEEND WITHIN 1 SECOND SO THAT PDC MAY REQUEST A TRIM OF THE S/C ATTITUDE
 R0173 THIS IS THE ONLY MEANS FOR MANUALLY TERMINATING A KALCMANU SUPERVISED MANEUVER.
 R0175 SUBROUTINES

R0176 KALCMANU USES A NUMBER OF INTERPRETIVE SUBROUTINES WHICH MAY BE OF GENERAL INTEREST. SINCE THESE ROUTINES
 R0178 WERE PROGRAMMED EXCLUSIVELY FOR KALCMANU, THEY ARE NOT, AS YET, GENERALLY AVAILABLE FOR USE BY OTHER PROGRAMS.

R0180
 R0181 ***
 R0182 ----

R0183 THIS SUBROUTINE MULTIPLIES TWO 3X3 MATRICES AND LEAVES THE RESULT IN THE FIRST 18 LOCATIONS OF THE PUSH
 R0185 DOWN LIST, I.E.,

R0186 (N N ")
 R0187 (C 1 2)
 R0188 * () *
 R0189 N = (N M 1) = M1 x M2
 R0190 (3 4 5)
 R0191 ()
 R0192 (N N 1)

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R0193 (6 7 8)

R0194

*

R0196 INDEX REGISTER X1 MUST BE LOADED WITH THE COMPLEMENT OF THE STARTING ADDRESS FOR M1, AND X2 MUST BE

R0198 *

R0199 LOADED WITH THE COMPLEMENT OF THE STARTING ADDRESS FOR M2. THE ROUTINE USES THE FIRST 20 LOCATIONS OF THE PUSH

R0201 DOWN LIST. THE FIRST ELEMENT OF THE MATRIX APPEARS IN FDC. PUSH UP FOR M.

R0203

E

R0205

R0206 TRANSPOS

R0207 -----

R0208 THIS ROUTINE TRANSPOSES A 3X3 MATRIX AND LEAVES THE RESULT IN THE PUSH DOWN LIST, I.E.,

R0210

R0211 * * T

R0212 M = M1

R0213 INDEX REGISTER X1 MUST CONTAIN THE COMPLEMENT OF THE STARTING ADDRESS FOR M1. PUSH UP FOR THE FIRST AND SUB-

R0215 * SEQUENT COMPONENTS OF M. THIS SUBROUTINE ALSO USES THE FIRST 20 LOCATIONS OF THE PUSH DOWN LIST.

R0216

R0218

R0219 CDU TO DCM

R0220 -----

R0221 THIS SUBROUTINE CONVERTS THREE CDU ANGLES IN T(MPAC) TO A DIRECTION COSINE MATRIX (SCALED BY 2) RELATING
R0223 THE CORRESPONDING S/C ORIENTATIONS TO THE STABLE MEMBER FRAME. THE FORMULAS FOR THIS CONVERSION ARE
R0225

R0226 M = COSY COSZ

R0227 1

R0228 M = -COSY SINZ COSX + SINY SINX

R0229 I

R0230 M = COSY SINZ SINX + SINY COSX

R0231 2

R0232 M = SINZ

R0233 3

R0234 M = COSZ COSX

R0235 4

R0236 M = -COSZ SINX

R0237 5

R0238 M = -SINY COSZ

R0239 6

R0240 M = SINY SINZ COSX + COSY SINX

R0241 7

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R0242 M = -SINY S11Z SINX + CCSY CCSX
 R0243 8

R0244 WHERE X = OUTER GIMBAL ANGLE
 R0245 Y = INNER GIMBAL ANGLE
 R0246 Z = MIDDLE GIMBAL ANGLE

R0247 THE INTERPRETATION OF THIS MATRIX IS AS FOLLOWS

R0248 IF A, A, A REPRESENT THE COMPONENTS OF A VECTOR IN S/C AXES THEN THE COMPONENTS OF THE SAME VECTOR IN
 R0249 X Y Z
 R0251 STABLE MEMBER AXES (B, B, B) ARE
 R0252 X Y Z

R0253 (B) (A)

R0254 (X) (X)

R0255 () ()

R0256 () * ()

R0257 (B) = M (A)

R0258 (Y) (Y)

R0259 () ()

R026 (B) (A)

R0261 (Z) (Z)

R0262 THE SUBROUTINE WILL STORE THIS MATRIX IN SEQUENTIAL LOCATIONS OF ERASABLE MEMORY AS SPECIFIED BY THE CALLING
 R0263 PROGRAM. TO DO THIS THE CALLING PROGRAM MUST FIRST LOAD X2 WITH THE COMPLEMENT OF THE STARTING ADDRESS FOR M.
 R0264
 R0265 INTERNALLY, THE ROUTINE USES THE FIRST 16 LOCATIONS OF THE PUSH DOWN LIST, ALSO STEP REGISTER S1 AND INDEX
 R0271 REGISTER X2.

R0272 FROM TO CPU

R0273 -----

R0274
 R0276 THIS ROUTINE EXTRACTS THE CPU ANGLES FROM A DIRECTION COSINE MATRIX (M SCALED BY 2) RELATING S/C AXIS TO
 R0277 *
 R0280 STABLE MEMBER AXES. X1 MUST CONTAIN THE COMPLEMENT OF THE STARTING ADDRESS FOR M. THE SUBROUTINE LEAVES THE
 R0281 *
 R0282 CORRESPONDING GIMBAL ANGLES IN VIMPAC) AS DOUBLE PRECISION 1:5 COMPLEMENT ANGLES SCALED BY 2PI. THE FORMULAS
 R0284 FOR THIS CONVERSION ARE

R0285 Z = ARCSIN (M)
 R0286 3

R0287 Y = ARCSIN (-M / CCSZ)
 R0288 6

R0289 IF M IS NEGATIVE, Y IS REPLACED BY PI SGN Y - Y
 R0290 0

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R0291 X = ARCSIN (-M / CCSZ)
 R0292 5

R0293 IF M IS NEGATIVE X IS REPLACED BY PI SEN X - X
 R0294 4

R0295 THIS ROUTINE DOES NOT SET THE PUSH DOWN POINTER, BUT USES THE NEXT 8 LOCATIONS OF THE PUSH DOWN LIST AND
 R0297 RETURNS THE POINTER TO ITS ORIGINAL SETTING. THIS PROCEDURE ALLOWS THE CALLER TO STORE THE MATRIX AT THE TOP OF
 R0299 THE PUSH DOWN LIST.

R0300 EFFCCMP
 R0301 -----

R0302 *

R0303 THIS ROUTINE COMPUTES THE DIRECTION COSINE MATRIX (DEL) RELATING CN
 R0304 -
 R0306 IS ROTATED WITH RESPECT TO THE FIRST BY AN ANGLE, A, ABOUT A UNIT VECTOR, U. THE FORMULA FOR THIS MATRIX IS

R0308
 R0309 * * --T *
 R0310 DEL = I CCSA + UU (1-COSA) + V SINA
 R0311 X

R0312 WHERE *
 R0313 I =
 R0314

R0315 2
 R0316 (U U U U)
 R0317 (X X Y X Z)
 R0318 ()
 R0319 --T (2)
 R0320 UU = (U L U L U)
 R0321 (Y X Y Y Z)
 R0322 ()
 R0323 (2)
 R0324 (U L U U U)
 R0325 (Z X Z Y Z)

R0326 () -U L)
 R0327 (2 Y)
 R0328 * ()
 R0329 V = (U 0 -U)
 R0330 X (Z X)
 R0331 ()
 R0332 (-U U C)
 R0333 (Y X)

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R0334 -
 R0335 L = UNIT ROTATION VECTOR RESOLVED INTO S/C AXES
 R0336 A = ROTATION ANGLE

R0337 *
 R0338 THE INTERPRETATION OF DEL IS AS FOLLOWS

R0339 IF Δ , Δ , Δ REPRESENT THE COMPONENT OF A VECTOR IN THE ROTATED FRAME, THEN THE COMPONENTS OF THE SAME
 R0341 X Y Z
 R0342 VECTOR IN THE ORIGINAL S/C AXES (E, E, E) ARE
 R0343 X Y Z

R0344	(B)		(A)
R0345	(X)		(X)
R0346	()	*	()
R0347	(B)	= DEL	(A)
R0348	(Y)		(Y)
R0349	()		()
R0350	(B)		(A)
R0351	(Z)		(Z)

R0352 THE ROUTINE WILL STORE THIS MATRIX (SCALED UNITY) IN SEQUENTIAL LOCATIONS OF ERASABLE MEMORY BEGINNING WITH
 R0354 THE LOCATION CALLED DEL. IN ORDER TO USE THE ROUTINE, THE CALLING PROGRAM MUST FIRST STORE L (A HALF UNIT
 R0356 DOUBLE PRECISION VECTOR) IN THE SET OF ERASABLE LOCATIONS BEGINNING WITH THE ADDRESS CALLED COF. THE ANGLE, A,
 R0358 MUST THEN BE LOADED INTO D(MPAC).

R0361 INTERNALLY, THE PROGRAM ALSO USES THE FIRST 10 LOCATIONS OF THE PUSH DOWN LIST.
 R0363

R0364 SEACCOUK
 R0365 -----

R0366 THIS BASIC LANGUAGE SUBROUTINE LOADS T(MPAC) WITH THE THREE COI ANGLES.
 R0368

R0369 STOMYAC
 R0370 -----

R0371 THIS IS A BASIC LANGUAGE SUBROUTINE WHICH LIMITS THE MAGNITUDE OF D(MPAC) TO + CP - DPCSMAX ON OVERFLOW.
 R0372

R0374 PROGRAM STORAGE ALLOCATION

R0375	1)	FIXED MEMORY	1059 WORDS
R0376	2)	ERASABLE MEMORY	98
R0377	3)	STATE SWITCHES	3

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R0378 4) FLAGS 1

R0379 JCB PRIORITIES

R0380 1) KALCMANU TEE

R0381 2) ONE SECOND UPDATE TRD

R0382 SUMMARY OF STATE SWITCHES AND FLAGWORDS USED BY KALCMANU.

R0383	STATE	FLAGWORD 2	SETTING	MEANING
R0384	SWITCH NO.	BIT NO.		
R0385	*			
R0386	31	14	0	MANEUVER WENT THROUGH GIMBAL LOCK
R0388			1	MANEUVER DID NOT GO THROUGH GIMBAL LOCK
R0390				
R0391	*			
R0392	32	13	0	CONTINUE UPDATE PROCESS
R0393			1	START UPDATE PROCESS
R0394	33	12	0	PERFORM FINAL P-AXIS YAW IF REQUIRED
R0396			1	IGNORE ANY FINAL P-AXIS YAW
R0398				
R0399	34	11	0	SIGNAL END OF KALCMANU
R0400			1	KALCMANU IN PROCESS USER MUST SET SWITCH BEFORE INITIATING

R0402 * INTERNAL TO KALCMANU

R0403 SUGGESTIONS FOR PROGRAM INTEGRATION

R0404 THE FOLLOWING VARIABLES SHOULD BE ASSIGNED TO UNSWITCH ERASABLE

R0415	CPHI
R0406	CTHETA
R0417	COSI
R0408	POINTVSM +5
R0409	SCAXIS +5
R0410	DELECCDU
R0411	DELECCDL1
R0412	DELECCDL2
R0413	RAT SINEX

R0414 THE FOLLOWING SUBROUTINES MAY BE PUT IN A DIFFERENT BANK

R0415 MXM3

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P0416	TRANSECS
R1417	SIGNMPAC
P0418	RF/PCDUK
R0419	COLTDCM

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0420 15,2050 BANK 15
 0421 REF 1 22,2000 SETLOC KALCMCN1
 0422 22,2004 BANK

0423 REF 3 LAST 287 56,1676 EBANK= BCDU

P0424 THE THREE DESIRED CDU ANGLES MUST BE STORED AS SINGLE PRECISION TWO'S COMPLEMENT ANGLES IN THE THREE SUCCESSIVE
 P0426 LOCATIONS, CPHI, CTHETA, CPSI.

0427	REF	1					COUNT#	\$\$/KALC		
0428	REF	14	LAST	341	22,2004	0 6042 1	KALCMAN3	TC	INTPRET	PICK UP THE CURRENT CDU ANGLES AND
0429					22,2005	77634 0		RTB		COMPUTE THE MATRIX FROM INITIAL S/C
0430	REF	1			22,2006	44403 0			READCDUK	AXES TO FINAL S/C AXES
0431	REF	4	LAST	352	22,2007	03277 0		STORE	PCDU	STORE INITIAL S/C ANGLES
0437					22,2010	51535 0		SLCAD	ABS	CHECK THE MAGNITUDE OF THE DESIRED
0438	REF	1			22,2011	00324 1			CPSI	MIDDLE GIMBAL ANGLE
0439					22,2012	51025 1		DSL	BPL	
0440	REF	1			22,2013	04403 1			LOCKANGL	IF GREATER THAN 70 DEG ABORT MANEUVER
0441	REF	1			22,2014	44724 0			TCCRADF	
0442					22,2015	72364 0		AXC,2	TLCAD	
0443	REF	4	LAST	137	22,2016	03246 1			MIS	
0444	REF	5	LAST	352	22,2017	03277 0			BCDU	
0445					22,2020	77624 1		CALL		COMPUTE THE TRANSFORMATION FROM INITIAL
0446	REF	1			22,2021	44410 1			CDUTDCM	S/C AXES TO STABLE MEMBER AXES
0447					22,2022	72364 0		AXC,2	TLCAD	
0448	REF	4	LAST	117	22,2023	02230 1			MFS	PREPARE TO CALCULATE ARRAY MFS
0449	REF	2	LAST	341	22,2024	01322 1			CPHI	
0450					22,2025	77624 1		CALL		
0451	REF	2	LAST	352	22,2026	44410 1			CDUTDCM	
0452					22,2027	45160 1	SECAD	AXC,1	CALL	MIS AND MFS ARRAYS CALCULATED \$2
0453	REF	5	LAST	352	22,2030	03246 1			MIS	
0454	REF	1			22,2031	44226 0			TRANSPOS	
0455					22,2032	45575 1		VLCAD	STADR	
0456	REF	12	LAST	136	22,2033	50457 1		STCVL	TMIS +120	
0457					22,2034	77626 0		STADR		
0458	REF	13	LAST	352	22,2035	50465 0		STCVL	TMIS +6	
0459					22,2036	77626 0		STADR		
0460	REF	14	LAST	352	22,2037	74473 1		STORE	TMIS	TMIS = TRANSPCSE(MIS) SCALED BY 2
0461					22,2040	75160 1		AXC,1	AXC,2	
0462	REF	15	LAST	352	22,2041	03303 1			TMIS	
0463	REF	5	LAST	352	22,2042	02230 1			MFS	
0464					22,2043	77624 1		CALL		
0465	REF	1			22,2044	44312 1			MXM3	
0466					22,2045	45575 1		VLCAD	STADR	
0467	REF	1			22,2046	51532 1		STCVL	MFI +120	
0468					22,2047	77626 0		STADR		
0469	REF	2	LAST	352	22,2050	51540 1		STCVL	MFI +6	
0470					22,2051	77626 0		STADR		
0471	REF	3	LAST	352	22,2052	75546 1		STORE	MFI	MFI = TMIS MFS (SCALED BY 4)
0472					22,2053	45001 1		SFTPD	CALL	TRANSPCSE MFI IN PC LIST

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0473				22,2154	05023 0		180	
0474	REF	1		22,2155	44335 1		TRANSPSPD	
0475				22,2156	45575 1	VLCAD	STADR	
0476	REF	1		22,2157	50457 1	STCVL	TMFI +120	
0477				22,2160	77626 0	STADR		
0478	REF	2	LAST	353	22,2161	50465 0	STCVL	TMFI +6
0479				22,2162	77626 0	STADR		
0480	REF	3	LAST	353	22,2163	74473 1	STORE	TMFI
R0481								TMFI = TRANSPSPD (MFI) SCALED BY 4
R0482								
R0483								
0484				22,2164	45345 1	DLCAD	DSU	
0485	REF	4	LAST	353	22,2165	02276 1		TMFI +2
0486	REF	4	LAST	352	22,2166	02233 1		MFI +2
0487				22,2167	45325 1	PDDL	DSU	CALCULATE CCF SCALED BY 2/SIN(AM)
0488	REF	5	LAST	353	22,2170	02235 1		MFI +4
0489	REF	5	LAST	353	22,2171	03310 0		TMFI +4
0490				22,2172	45325 1	PDDL	DSU	
0491	REF	6	LAST	353	22,2173	03316 0		TMFI +100
0492	REF	6	LAST	353	22,2174	02243 0		MFI +100
0493				22,2175	77666 1	VDEF		
0494	REF	5	LAST	137	22,2176	03326 0	STORE	CCFSKEW
R0495								EQUALS MFISKEW
R0496								
R0497								
0498				22,2177	42345 1	DLCAD	DAD	
0499	REF	7	LAST	353	22,2178	02231 0		MFI
0500	REF	8	LAST	353	22,2179	02251 0		MFI +160
0501				22,2182	42225 0	DSU	DAD	
0502	REF	2	LAST	37	22,2183	06514 1		CP1/4TH
0503	REF	9	LAST	353	22,2184	02241 1		MFI +80
0504	REF	2	LAST	136	22,2185	02334 0	STORE	CAM
0505				22,2186	77725 1	ARCCOS		CAM = (MFI0+MFI4+MFI8-1)/2 HALF SCALE
0506	REF	1		22,2187	03336 1	STORE	AM	AM=ARCCOS(CAM) (AM SCALED BY 2)
0507				22,2188	51125 1	DSU	BPL	
0508	REF	1		22,2189	04263 0		MINANG	
0509	REF	1		22,2192	44117 0		CHECKMAX	
0510				22,2193	77751 1	TLCAD		MANEUVER LESS THAN .25 DEGREES
0511	REF	3	LAST	352	22,2194	03222 1	CPHI	GO DIRECTLY INTO ATTITUDE HOLD
0512	REF	6	LAST	196	22,2195	07236 1	STCALL	CDLXD
0513	REF	1		22,2196	44742 0		TCCBADI	ABORT COMMANDER ANGLES
								STOP PATH AND EXIT
0514				22,2197	45345 1	CHECKMAX	DLCAD	
0515	REF	2	LAST	353	22,2198	03336 1	DSU	AM
0516	REF	1		22,2199	04265 0		MAXANG	
0517				22,2202	77244 0	BPL	VLCAD	
0518	REF	1		22,2203	44131 1		ALTCALC	UNIT
0519	REF	6	LAST	353	22,2204	03226 0	CCFSKEW	CCFSKEW
0520				22,2205	77656 1	UNIT		
0521	REF	1		22,2206	03271 0	STORE	CCF	CCF IS THE MANEUVER AXIS

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0522					22,2127	77650 1	GOTO		SEE IF MANEUVER GOES THRU GIMBAL LOCK
0523	REF	1			22,2130	44744 0		LCOSKIFT	
0524					22,2131	52375 0	ALTCALC	VLCAD	IF AN GREATER THAN 170 DEGREES
0525	REF	10	LAST	353	22,2132	02231 0		MFI	
0526	REF	7	LAST	353	22,2133	03374 0		TMFI	
0527					22,2134	77762 1		VSR1	
0528	REF	1			22,2135	27374 0	STCVL	MFISYM	
0529	REF	11	LAST	354	22,2136	02237 0		MFI +6	
0530					22,2137	74455 0	VAC	VSR1	
0531	REF	8	LAST	354	22,2140	03312 1		TMFI +6	
0532	REF	2	LAST	354	22,2141	27312 1	STCVL	MFISYM +6	
0533	REF	12	LAST	354	22,2142	02245 0		MFI +120	
0534					22,2143	74455 0	VAC	VSR1	
0535	REF	9	LAST	354	22,2144	03320 0		TMFI +120	
0536	REF	3	LAST	354	22,2145	03320 0	STCRE	MFISYM +120	MFISYM=(MFI+TMFI)/2 SCALED BY 4
R0537									
R0538									
R0539									
R0540									
0541					22,2146	70545 1	CLOCAC	SR1	
0542	REF	3	LAST	353	22,2147	03334 0		CAM	
0543					22,2150	45325 1	PDDL	DSU	PDC CAM \$4
0544	REF	1			22,2151	06522 1		DEHALF	
0545	REF	4	LAST	354	22,2152	03234 0		CAM	
0546					22,2153	65204 1	BOVB	PDDL	PD2 1 - CAM \$2
0547	REF	1			22,2154	21713 1		SIGNMPAC	
0548	REF	4	LAST	354	22,2155	03224 1		MFISYM +160	
0549					22,2156	56225 1	DSU	DDV	
0550					22,2157	00001 0		0	
0551					22,2160	00003 1		2	
0552					22,2161	65365 1	SQRT	PDDL	COFZ = SQRT(MFISYM3-CAM)/(1-CAM)
0553	REF	5	LAST	354	22,2162	03314 1		MFISYM +80	\$ ROOT 2
0554					22,2163	56225 1	DSU	DDV	
0555					22,2164	00001 0		0	
0556					22,2165	00003 1		2	
0557					22,2166	65366 1	DSU	PDDL	COFY = SQRT(MFISYM4-CAM)/(1-CAM) \$RECT2
0558	REF	6	LAST	354	22,2167	03374 0		MFISYM	
0559					22,2170	56225 1	DSU	DDV	
0560					22,2171	00001 0		0	
0561					22,2172	00003 1		2	
0562					22,2173	55566 1	SQRT	VDFE	COFX = SQRT(MFISYM-CAM)/(1-CAM) \$RECT 2
0563					22,2174	77655 1	UNIT		
0564	REF	2	LAST	353	22,2175	03271 0	STCRE	CCF	
R0565									
R0566									
R0567									
0568					22,2176	45345 1	CCFMAXCC	CLOCAC	DSU
0569	REF	3	LAST	354	22,2177	03271 0		CCF	
0570	REF	4	LAST	354	22,2200	03273 1		CCF +2	
0571					22,2201	71240 1	BMN	CLOCAC	COFY C COFX

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0572	REF	1		22,2232	44211 0		CCMP12	
0573	REF	6	LAST	354	22,2233	03271 0	CCF	
0574					22,2234	50025 0	BMA	
0575	REF	6	LAST	355	22,2235	03275 1	CCF +4	
0576	REF	1			22,2236	44266 0	METHCD3	CCFZ C CCFX CR CCFY
0577					22,2237	77650 1	GOIC	
0578	REF	1			22,2238	44242 0	METHCD1	CCFX G CCFY CR CCFZ
0579					22,2239	45345 1	CCMP12	
0580	REF	7	LAST	355	22,2240	03273 1	CLDAD	
0581	REF	8	LAST	355	22,2241	03275 1	CCF +2	
0582					22,2242	77640 0	CCF +4	
0583	REF	2	LAST	355	22,2243	44266 0	BMA	
							METHCD3	CCFZ G CCFY CR CCFX
0584					22,2244	51145 0	METHCD2	
0585	REF	7	LAST	353	22,2245	03330 1	CLDAD	BPL CCFX MAX LY
0586	REF	1			22,2246	44224 0		
0587					22,2247	57575 1	VLCAD	VCCMP
0588	REF	9	LAST	355	22,2248	03271 0	CCF	
0589	REF	10	LAST	355	22,2249	03271 0	STORE	CCF
0590					22,2250	51145 0	L2PCS	
0591	REF	7	LAST	354	22,2251	03306 1	CLDAD	BPL MFISYM +2 LX LY
0592	REF	1			22,2252	44232 1		
0593					22,2253	57545 1	DLOAD	CCMP
0594	REF	11	LAST	355	22,2254	03271 0	CCF	SIGN OF LX CFFCSITE TO UY
0595	REF	12	LAST	355	22,2255	03271 0	STORE	CCF
0596					22,2256	51145 0	DKU21	
0597	REF	8	LAST	355	22,2257	03316 0	DLOAD	BPL MFISYM +100 UY LZ
0598	REF	2	LAST	354	22,2258	44744 0		
0599					22,2259	57545 1	CLDAD	LCCSKIRT DCCMP
0600	REF	13	LAST	355	22,2260	03275 1	CCF +4	SIGN OF LZ CFFCSITE TO LY
0601	REF	14	LAST	355	22,2261	03275 1	STORE	CCF +4
0602					22,2262	77650 1	GOIC	
0603	REF	3	LAST	355	22,2263	44744 0		
0604					22,2264	51145 0	METHCD1	
0605	REF	8	LAST	355	22,2265	03326 0	DLOAD	BPL CCFX MAX LX
0606	REF	1			22,2266	44250 0		
0607					22,2267	57575 1	VLCAD	VCCMP
0608	REF	15	LAST	355	22,2268	03271 0	CCF	
0609	REF	16	LAST	355	22,2269	03271 0	STORE	CCF
0610					22,2270	51145 0	U1PCS	
0611	REF	9	LAST	355	22,2271	03306 1	CLDAD	BPL MFISYM +2 UX UY
0612	REF	1			22,2272	44256 0		
0613					22,2273	57545 1	CLDAD	DCCMP
0614	REF	17	LAST	355	22,2274	03273 1	CCF +2	SIGN OF UY CFFCSITE TO LX
0615	REF	18	LAST	355	22,2275	03273 1	STORE	CCF +2
0616					22,2276	51145 0	DKU12	
0617	REF	11	LAST	355	22,2277	03310 0	CLDAD	BPL MFISYM +4 LX UZ
0618	REF	4	LAST	355	22,2278	44744 0		
0619					22,2279	57545 1	DLOAD	LCCSKIRT DCCMP
0620	REF	19	LAST	355	22,2280	03275 1	CCF +4	SIGN OF UZ CFFCSITE TO UY

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0621	REF	20	LAST	355	22,2263	03275 1	STORE	CCF +4	
0622					22,2264	77650 1	GOTO		
0623	REF	5	LAST	355	22,2265	44744 0		LCCSKIPT	
0624					22,2266	51145 0	METHCC3	CLCAD	BPL
0625	REF	9	LAST	355	22,2267	03332 0		CCFSKEW +4	CCFZ MAX
0626	REF	1			22,2270	44274 0		U3PCS	LZ
0627					22,2271	57575 1		VLOAD	VCCMP
0628	REF	21	LAST	356	22,2272	03271 0		CCF	
0629	REF	22	LAST	356	22,2273	03271 0		STORE	CCF
0630					22,2274	51145 0	U3POS	DLCAD	BPL
0631	REF	11	LAST	355	22,2275	03310 0		MF1SYM +4	UX LZ
0632	REF	1			22,2276	44302 0		CKL31	
0633					22,2277	57545 1		DLCAD	DCCMP
0634	REF	23	LAST	356	22,2300	03271 0		CCF	SIGN CF UX OPPOSITE TO LZ
0635	REF	24	LAST	356	22,2301	03271 0		STORE	CCF
0636					22,2302	51145 0	CKU31	DLCAD	BPL
0637	REF	12	LAST	356	22,2303	03316 0		MF1SYM +100	UY UZ
0638	REF	6	LAST	356	22,2304	44744 0		LCCSKIPT	
0639					22,2305	57545 1		DLCAD	DCCMP
0640	REF	25	LAST	356	22,2306	03273 1		CCF +2	SIGN CF UY OPPOSITE TO UZ
0641	REF	26	LAST	356	22,2307	03273 1		STORE	CCF +2
0642					22,2310	77650 1		GOTO	
0643	REF	7	LAST	356	22,2311	44744 0			LCCSKIPT

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R0644 MATRIX OPERATIONS

0645				13,2217		BANK	13	
0646	RFF	1		22,2210		SETLCC	KALCMCN2	
0647				22,2212		BANK		
0648	RFF	6	LAST	352	EE,1676	EBANK=	BCPU	
0649				22,2312	76611 1	MXM3	SETPD	VLCAD*
0650				22,2313	00001 0			0
0651				22,2314	00001 0			0,1
0652				22,2315	62703 1		VXM*	PDVL*
0653				22,2316	77776 1			0,2
0654				22,2317	00007 0			6,1
0655				22,2320	62703 1		VXM*	PDVL*
0656				22,2321	77776 1			0,2
0657				22,2322	00015 0			120,1
0658				22,2323	41503 1		VXM*	PLSH
0659				22,2324	77776 1			0,2
0660				22,2325	77616 0		FVC	

MXM3 MULTIPLIES 2 3X3 MATRICES
AND LEAVES RESULT IN PD LIST
AND MFAC

R0661 RETURN WITH MIXM2 IN PD LIST
R0662

0663				22,2326	76601 1	TRANSPDS	SETPD	VLCAD*	TRANSPOSES TRANSPOSES A 3X3 MATRIX
0664				22,2327	00001 0			0	AND LEAVES RESULT IN PD LIST
0665				22,2330	00001 0			0,1	MATRIX ADDRESS IN XPI
0666				22,2331	62713 0		PDVL*	PDVL*	
0667				22,2332	00007 0			6,1	
0668				22,2333	00015 0			120,1	
0669				22,2334	77606 1		PUSH		MATRIX IN PD
0670				22,2335	77776 1	TRANSPSPE	EXIT		ENTER WITH MATRIX AT C IN PD LIST
0671	RFF	9	LAST	299	50 120 1		INDEX	FIXLCC	
0672				22,2337	52 013 1		CXCH	12	
0673	RFF	10	LAST	357	22,2340	50 120 1		INDEX	FIXLCC
0674				22,2341	52 017 0		CXCH	16	
0675	RFF	11	LAST	357	22,2342	50 120 1		INDEX	FIXLCC
0676				22,2343	52 013 1		CXCH	12	
0677	RFF	12	LAST	357	22,2344	50 120 1		INDEX	FIXLCC
0678				22,2345	52 015 1		CXCH	14	
0679	RFF	13	LAST	357	22,2346	50 120 1		INDEX	FIXLCC
0680				22,2347	52 015 0		CXCH	4	
0681	RFF	14	LAST	357	22,2350	50 120 1		INDEX	FIXLCC
0682				22,2351	52 015 1		CXCH	14	
0683	RFF	15	LAST	357	22,2352	50 120 1		INDEX	FIXLCC
0684				22,2353	52 003 0		CXCH	2	
0685	RFF	16	LAST	357	22,2354	50 120 1		INDEX	FIXLCC
0686				22,2355	52 007 1		CXCH	6	
0687	RFF	17	LAST	357	22,2356	50 120 1		INDEX	FIXLCC
0688				22,2357	52 003 0		CXCH	2	

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0689 REF 15 LAST 352 22,2360 0 6042 I TC INTPRFT
0690 22,2361 77616 0 RVQ

0691 15,2050 BANK 15
0692 REF 2 LAST 352 22,2360 SETLOC KALCOMN1
0693 22,2362 BANK

0694 REF 7 LAST 357 56,1676 EBANK= BCDL

0695 22,2362 00013 0 MINANG 2DEC 0.00069375
0695 22,2363 12563 0
0696 22,2364 17070 0 MAXANG 2DEC 0.47222222
0696 22,2365 34343 1

R0697 GIMBAL LOCK CONSTANTS

R0698 D = MGA CORRESPONDING TO GIMBAL LOCK = 60 DEGREES
R0699 ANGL = BUFFER ANGLE (TO AVOID DIVISIONS BY ZERO) = 2 DEGREES

0700 22,2366 15666 0 SD 2DEC .433015 = SIN(D) \$2
0700 22,2367 21443 0
0701 22,2370 33555 1 K3S1 2DEC .86603 = SIN(D) \$1
0701 22,2371 01106 1
0702 22,2372 67777 1 K4 2DEC -.25 = -COS(D) \$2
0702 22,2373 77777 0
0703 22,2374 04000 0 K4SQ 2DEC .125 = COS(D)COS(D) \$2
0703 22,2375 00000 1
0704 22,2376 00216 1 SNGLOC 2DEC .008725 = SIN(ANGL)COS(D) \$2
0704 22,2377 36323 0
0705 22,2400 17773 1 CNGL 2DEC .499695 COS(ANGL) \$2
0705 22,2401 00057 0
0706 22,2402 14344 1 LOCKANGL DEC .388889 = 70 DEGREES

R0707 INTERPRETIVE SUBROUTINE TO READ THE CDU ANGLES

0708 REF 5 LAST 254 22,2403 3 0034 0 READCDUK CA CDUZ LOAD T(MFAC) WITH CDU ANGLES
0709 REF 67 LAST 337 22,2404 54 156 1 TS MFAC +2
0710 22,2405 0 0006 1 EXTENC
0711 REF 7 LAST 306 22,2406 3 0033 1 DCA CDUX AND CHANGE MODE TO TRIPLE PRECISION
0712 REF 1 22,2407 1 6501 1 TCF TLEAD +6

0713 22,2410 66370 0 CDUTODCM AX+1,1 SSP
0714 22,2411 00013 1 OCT 3
0715 REF 1 22,2412 00051 0 S1
0716 22,2413 00001 0 CCT 1 SET XR1, S1, AND PD FOR LCCF
0717 22,2414 00010 0 STORE 7
0718 22,2415 77601 0 SETFC
0719 22,2416 00001 0
0720 22,2417 47133 0 LCCPSIN SICAC* PTR
0721 22,2420 00013 0 TCD,1
0722 REF 9 LAST 325 22,2421 21577 1 CDULOGIC

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0723	22,2422	00013 0	STORE	100	LCAD FC WITH 0 SIN(PHI)
0724	22,2423	65356 1	SIN	PDCL	2 COS(PHI)
0725	22,2424	00013 0		100	4 SIN(THETA)
0726	22,2425	41546 0	COS	PUSH	6 COS(THETA)
0727	22,2426	71300 1	TIX,1	PLCAD	8 SIN(PSI)
0728	22,2427	44417 0		LCCPSIN	10 COS(PSI)
0729	22,2430	00007 0		0	
0730	22,2431	72405 0	DMP	SL1	
0731	22,2432	00013 0		100	
0732	22,2433	10001 1	STORE	1,2	C0=COS(THETA)COS(PSI)
0733	22,2434	41345 0	CLCAD	DMP	
0734	22,2435	00005 1		4	
0735	22,2436	00001 0		0	
0736	22,2437	41325 0	PDCL	DMP	(FC6 SIN(THETA)SIN(PHI))
0737	22,2440	00007 0		6	
0738	22,2441	00011 1		80	
0739	22,2442	72405 0	DMP	SL1	
0740	22,2443	00003 1		2	
0741	22,2444	72421 0	PDCL	SL1	
0742	22,2445	00015 0		120	
0743	22,2446	10003 0	STORE	2,2	C1=-COS(THETA)SIN(PSI)COS(PHI)
0744	22,2447	41345 0	CLCAD	DMP	
0745	22,2450	00003 1		2	
0746	22,2451	00005 1		4	
0747	22,2452	41325 0	PDCL	DMP	(FC7 COS(PHI)SIN(THETA)) SCALED 4
0748	22,2453	00007 0		6	
0749	22,2454	00011 1		80	
0750	22,2455	72405 0	DMP	SL1	
0751	22,2456	00001 0		0	
0752	22,2457	72415 1	CAD	SL1	
0753	22,2460	00017 1		140	
0754	22,2461	10005 0	STORE	4,2	C2=COS(THETA)SIN(PSI)SIN(PHI)
0755	22,2462	77745 1	CLCAD		
0756	22,2463	00011 1		80	
0757	22,2464	10007 1	STORE	6,2	C3=SIN(PSI)
0758	22,2465	77745 1	CLCAD		
0759	22,2466	00013 0		100	
0760	22,2467	72405 0	DMP	SL1	
0761	22,2470	00003 1		2	
0762	22,2471	10011 0	STORE	80,2	C4=COS(PSI)COS(PHI)
0763	22,2472	41345 0	CLCAD	DMP	
0764	22,2473	00013 0		100	
0765	22,2474	00001 0		0	
0766	22,2475	72476 1	DCOMP	SL1	
0767	22,2476	10013 1	STORE	100,2	C5=-COS(PSI)SIN(PHI)
0768	22,2477	41345 0	CLCAD	DMP	
0769	22,2500	00005 1		4	
0770	22,2501	00013 0		100	
0771	22,2502	72476 1	DCOMP	SL1	
0772	22,2503	10015 1	STORE	120,2	C6=-SIN(THETA)COS(PSI)

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0773	22,2504	77745 1	DLOAD		
0774	22,2505	72405 0	DMP	SL1	(PUSH LP 7)
0775	22,2506	00011 1		8D	
0776	22,2507	41325 0	PDDL	DMP	(PD7 CCS(PHI)SIN(THETA)SIN(PSI)) SCALE4
0777	22,2510	00007 0		6	
0778	22,2511	00001 0		0	
0779	22,2512	72415 1	DAD	SL1	(PUSH LP 7)
0780	22,2513	77626 0	STADR		C7=CCS(PHI)SIN(THETA)SIN(PSI)
0781	22,2514	67760 1	STORE	14D,2	+CCS(THETA)SIN(PHI)
0782	22,2515	77745 1	DLOAD		
0783	22,2516	72405 0	DMP	SL1	(PUSH LP 6)
0784	22,2517	00011 1		8D	
0785	22,2520	41325 0	PDDL	DMP	(PD6 SIN(THETA)SIN(PHI)SIN(PSI)) SCALE4
0786	22,2521	00007 0		6	
0787	22,2522	00013 1		2	
0788	22,2523	72425 1	DSL	SL1	(PUSH LP 6)
0789	22,2524	77626 0	STADR		
0790	22,2525	67756 1	STORE	16D,2	C8=-SIN(THETA)SIN(PHI)SIN(PSI)
0791	22,2526	77616 0	RVQ		+COS(THETA)COS(PHI)

R0792 CALCULATION OF THE MATRIX DEL.....

R0793 * * --T *

R0794 DEL = (DMATRIX)COS(A)+UU (1-COS(A))+UX SIN(A) SCALED 1

R0795 -

R0796 WHERE U IS A UNIT VECTOR (OF SCALED 2) ALONG THE AXIS OF ROTATION.

R0798 A IS THE ANGLE OF ROTATION (OF SCALED 2)

R0799 -

R0800 UPON ENTRY THE STARTING ADDRESS OF U IS CCF, AND A IS IN MPAC

0801	22,2527	41401 1	DELCOMP	SETPD	PUSH	MPAC CONTAINS THE ANGLE A
0802	22,2530	00001 0			0	
0803	22,2531	65356 1	SIN	PDDL		PD0 = SIN(A)
0804	22,2532	41546 0	COS	PUSH		PD2 = CCS(A)
0805	22,2533	65312 0	SR2	PDDL		PD2 = CCS(A)
0806	22,2534	41021 1	BDSL	BCVB		\$E
0807	REF 2 LAST 354	22,2535	06522 1		DPHALF	
0808	REF 2 LAST 354	22,2536	21713 1		SIGNMPAC	
0809	22,2537	77725 1	PDDL			PD4 = 1-COS(A)

R0810 COMPLETE THE DIAGONAL COMPONENTS OF DEL

0811	REF 27 LAST 356	22,2540	03271 0		CCF
0812		22,2541	41316 0	DSQ	DMP
0813		22,2542	00005 1		4
0814		22,2543	52415 0	DAD	SL3
0815		22,2544	00003 1		2
0816		22,2545	77604 0	BCVB	
0817	REF 3 LAST 360	22,2546	21713 1		SIGNMPAC

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0818	REF	1		22,2547	16231 0	STCOL	KEL	UX UX (1-COS(A)) +COS(A)	\$1
0819	REF	28	LAST	361	22,2551	12273 1	CCF +2		
0820					22,2551	41316 0	DMP		
0821					22,2552	00005 1	4		
0822					22,2553	52415 0	CAC	SL3	
0823					22,2554	01113 1	2		
0824					22,2555	77614 0	BOVB		
0825	REF	4	LAST	361	22,2556	21713 1	SIGNMPAC		
0826	REF	2	LAST	361	22,2557	16241 1	STCOL	KEL +8D	UY UY (1-COS(A)) +COS(A)
0827	REF	20	LAST	361	22,2561	03275 1	CCF +4		
0828					22,2561	41316 0	DMP		
0829					22,2562	00005 1	4		
0830					22,2563	52415 0	CAC	SL3	
0831					22,2564	01113 1	2		
0832					22,2565	77614 0	BOVB		
0833	REF	5	LAST	361	22,2566	21713 1	SIGNMPAC		
0834	REF	3	LAST	361	22,2567	02251 0	STCOL	KEL +16D	UZ UZ (1-COS(A)) +COS(A)

R0835 COMPUTE THE OFF DIAGONAL TERMS OF CFL

0836					22,2571	41345 0	CLCAC	DMP	
0837	REF	30	LAST	361	22,2571	03271 0	CCF		
0838	REF	31	LAST	361	22,2572	12273 1	CCF +2		
0839					22,2573	72415 0	DMP	SL1	
0840					22,2574	00005 1	4		
0841					22,2575	41325 0	PDCL	DMP	DE UX LY (1-COS A)
0842	REF	32	LAST	361	22,2576	03275 1	CCF +4		\$ 4
0843					22,2577	00011 0	0		
0844					22,2610	43216 1	PUSH	DAL	DE UZ SIN A
0845					22,2611	00007 0	6		\$ 4
0846					22,2612	41112 0	SL2	BOVB	
0847	REF	4	LAST	361	22,2613	21713 1	SIGNMPAC		
0848	REF	4	LAST	361	22,2614	16237 0	STCOL	KEL +6	
0849					22,2615	62421 1	RDSU	SL2	
0850					22,2616	77614 0	BOVB		
0851	REF	7	LAST	361	22,2617	21713 1	SIGNMPAC		
0852	REF	5	LAST	361	22,2618	16233 1	STCOL	KEL +2	
0853	REF	33	LAST	361	22,2611	03271 0	CCF		
0854					22,2612	41215 0	DMP	DMP	
0855	REF	34	LAST	361	22,2613	03275 1	CCF +4		
0856					22,2614	00005 1	4		
0857					22,2615	65352 0	SL1	PDCL	DE UX LZ (1-COS A)
0858	REF	35	LAST	361	22,2616	03273 1	CCF +2		\$ 4
0859					22,2617	41415 0	DMP	PLSH	DE LY SIN(A)
0860					22,2620	03011 0	0		
0861					22,2621	62415 0	CAC	SL2	
0862					22,2622	01117 0	6		
0863					22,2623	77614 0	BOVB		
0864	REF	8	LAST	361	22,2624	21713 1	SIGNMPAC		
0865	REF	6	LAST	361	22,2625	16235 1	STCOL	KEL +4	UX LZ (1-COS(A))+LY SIN(A)

L ATTITUDE MANEUVER ROUTINE

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0866				22,2626	62421 1	BDSU	SL2	
0867				22,2627	77604 0	BOVB		
0868	REF	9	LAST	361	22,2630	21713 1	SIGNMPAC	
0869	REF	7	LAST	361	22,2631	16245 0	STODL	KEL +12D LX UZ (1-CCS(A)) -LY SIN(A)
0870	REF	36	LAST	361	22,2632	03273 1	CCF +2	
0871					22,2633	41205 0	DMP	DMP
0872	REF	37	LAST	362	22,2634	03275 1	CCF +4	
0873					22,2635	00005 1	4	
0874					22,2636	65252 0	SL1	PDDL D6 UY UZ (1-CCS(A)) 4
0875	REF	38	LAST	362	22,2637	03271 0	CCF	
0876					22,2640	41405 0	DMP	PLSH D8 UX SIN(A)
0877					22,2641	00001 0	0	
0878					22,2642	62415 0	DAD	SL2
0879					22,2643	00007 0	6	
0880					22,2644	77604 0	BOVB	
0881	REF	10	LAST	362	22,2645	21713 1	SIGNMPAC	
0882	REF	8	LAST	362	22,2646	16247 1	STODL	KEL +14D UY UZ (1-CCS(A)) +LX SIN(A)
0883					22,2647	62421 1	BDSU	SL2
0884					22,2650	77604 0	BOVB	
0885	REF	11	LAST	362	22,2651	21713 1	SIGNMPAC	
0886	REF	9	LAST	362	22,2652	02243 0	STODL	KEL +10D UY UZ (1-CCS(A)) -UX SIN(A)
0887					22,2653	77616 0	RVG	

R0888 DIRECTION COSINE MATRIX TO CDU ANGLE ROUTINE

R0889 X1 CONTAINS THE COMPLEMENT OF THE STARTING ADDRESS FOR MATRIX (SCALED 2)

R0890 LEAVES CDU ANGLES SCALED 2PI IN V(MPAC)

R0891 COS(MGA) WILL BE LEFT IN S1 (SCALED 1)

R0892 THE DIRECTION COSINE MATRIX RELATING S/C AXES TO STABLE MEMBER AXES CAN BE WRITTEN AS***

R0894 C =COS(THETA)COS(PHI)

R0895 0

R0896 C =-COS(THETA)SIN(PHI)COS(PHI)+S1 (THETA)SIN(PHI)

R0897 1

R0898 C =COS(THETA)SIN(PHI)SIN(PHI) + S1 N(THETA)COS(PHI)

R0899 2

R0900 C =SIN(PHI)

R0901 3

R0902 C =COS(PHI)COS(PHI)

R0903 4

R0904 C =-COS(PHI)SIN(PHI)

R0905 5

R0906 C =-SIN(THETA)COS(PHI)

R0907 6

R0908 C =SIN(THETA)SIN(PHI)COS(PHI)+COS(THETA)SIN(PHI)

R0909 7

R0910 C =-SIN(THETA)SIN(PHI)SIN(PHI)+COS(THETA)COS(PHI)

R0911 8

L ATTITUDE MANEUVER ROUTINE

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R0912	WHERE PHI = CCA
R0913	THETA = TGA
R0914	PSI = MGA

0915					22,2654	67543 1	CCMTOCCU	CLDAC*	ARCSIN	
0916					22,2655	71117 0			6,1	
0917					22,2656	71476 0		PLSH	CCS	FC +0 FS1
0918					22,2657	41152 1		SL1	BCVB	
0919	REF	12	LAST	362	22,2660	21713 1			SIGAMPAC	
0920	REF	2	LAST	358	22,2661	91051 0		STORE	S1	
0921					22,2662	57543 1		CLCAC*	CCOMP	
0922					22,2663	00015 0			120,1	
0923					22,2664	67471 1		CDV	ARCSIN	
0924	REF	3	LAST	363	22,2665	71151 0			S1	
0925					22,2666	51123 0		PDDL*	BFL	FC +2 THETA
0926					22,2667	71101 0			0,1	
0927	REF	1			22,2670	44702 1			CKTHETA	MUST CHECK THE SIGN OF CCS(THETA)
0928					22,2671	57545 1		DLCAD	DCOMP	TO DETERMINE THE PROPER QUADRANT
0929					22,2672	43244 1		BFL	DAC	
0930	REF	1			22,2673	44677 1			SUHALFA	
0931	REF	3	LAST	360	22,2674	16522 1			DPHALF	
0932					22,2675	77651 1		CCTC		
0933	REF	1			22,2676	44701 1			CALCPHI	
0934					22,2677	77625 0	SUHALFA	DSU		
0935	REF	4	LAST	363	22,2700	06522 1			DPHALF	
0936					22,2701	77616 1	CALCPHI	PUSH		
0937					22,2702	57543 1	CKTHETA	CLCAC*	CCOMP	
0938					22,2703	70012 0			120,1	
0939					22,2704	67471 1		CDV	ARCSIN	
0940	REF	4	LAST	362	22,2705	91051 0			S1	
0941					22,2706	51123 0		PDDL*	BFL	FLSH DOWN PHI
0942					22,2707	70011 1			80,1	
0943	REF	1			22,2710	44722 0			CKPHT	
0944					22,2711	57545 1		DLCAD	DCOMP	FLSH UP PHI
0945					22,2712	43244 1		BFL	DAC	
0946	REF	1			22,2713	44717 0			SUHALFAP	
0947	REF	5	LAST	363	22,2714	16522 1			DPHALF	
0948					22,2715	77651 1		CCTC		
0949	REF	1			22,2716	44723 1			VECCFANG	
0950					22,2717	52125 1	SUHALFAP	DSU	GOTO	
0951	REF	6	LAST	363	22,2720	06522 1			DPHALF	
0952	REF	2	LAST	363	22,2721	44723 1			VECCFANG	
0953					22,2722	77745 1	CKPHI	CLCAC		
0954					22,2723	43466 1	VECCFANG	VOFF	BVC	FLSH UP PHI

L ATTITUDE MANEUVER ROUTINE

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PO955 ROUTINES FOR TERMINATING THE AUTOMATIC MANEUVER AND RETURNING TO USER

0956				22,2724	77776 1	TOCBACF	EXIT	
0957	REF	19	LAST	269	22,2725	0 5567 0	TC	ALARM
0958					22,2726	00401 1	CCT	00401
0959	REF	1			22,2727	1 2732 1	TCF	NOGO
								DO NOT ZERO ATTITUDE ERRORS
0960	REF	66	LAST	341	22,2730	0 4616 1	TC	BANKCALL
0961	REF	2	LAST	286	22,2731	40154 0	CADR	ZATTERCR
								ZERO ATTITUDE ERRORS
0962	REF	67	LAST	364	22,2732	0 4616 1	NOGO	TC
								BANKCALL
0963	REF	2	LAST	286	22,2733	40166 1	CADR	STOPRATE
								STOP RATES
0964	REF	13	LAST	333	22,2734	3 4752 0	CAF	TWC
0965					22,2735	0 1004 0	INFINT	
								ALL RETURNS ARE NOW MADE VIA GOODEND
0966	REF	12	LAST	297	22,2736	0 5203 0	TC	WAITLIST
0967	REF	8	LAST	358	E6,1676		EBANK=	BCDU
0968	REF	1			22,2737	03234 1	ZOCADR	GOODMANU
0968	REF	1			22,2740	44066 1		
0969	REF	31	LAST	337	22,2741	1 5155 1	TCF	ENDOFJOB
0970					22,2742	77776 1	TOCBACI	EXIT
0971	REF	2	LAST	364	22,2743	1 2732 1	TCF	NOGO

L GIMBAL LOCK AVOIDANCE

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0001				15,2150		BANK	15		
0002	REF	3	LAST	358	22,2741	SETLOC	KALCMEN1		
0003					22,2744	BANK			
0004									
0005	DETECTING GIMBAL LOCK								
0006	REF	1			22,2744	LOCKSKIRT	EQUALS	NOCIMLOC	
0007					22,2744	77614	1	NOCIMLOC	SET
0008	REF	1			22,2745	01174	0		CALCMAN3
0009					22,2746	77740	0	WCALC	LXC,1
0010	REF	3	LAST	295	22,2747	11322	0		RATEINDEX
0011	REF	1			22,2750	04772	1		ARATE,1
0012					22,2751	45012	1	SR4	CALL
0013	REF	1			22,2752	44527	1		LELOCMP
0014									CHOOSE THE DESIRED MANEUVER RATE FROM A LIST OF FOUR
0015					22,2753	74343	0		COMPLETE THE INCREMENTAL ROTATION MATRIX CEL CORRESPONDING TO A 1 SEC ROTATION ABOUT CCF
0016	REF	2	LAST	365	22,2754	04772	1	CLDAD*	VXSC
0017	REF	39	LAST	362	22,2755	02271	0		ARATE,1
0018	REF	1			22,2756	17326	0		CLF
0019	REF	2	LAST	353	22,2757	02336	1	STOCL	BRATE
0020					22,2760	55605	1		COMPONENT MANEUVER RATES 45 DEG/SEC
0021	REF	1			22,2761	05002	0	OMP	AM
0022	REF	3	LAST	365	22,2762	04772	1		ODV*
0023					22,2763	77661	0		ANGLTIME
0024					22,2764	21616	0	SR	ARATE,1
0025	REF	1			22,2765	02224	0		5
0026					22,2766	77614	1	STORE	TM
0027	REF	1			22,2767	01035	0	SFTGC	
0028	REF	1			22,2771	45110	1		MANEUVER EXECUTION TIME SCALED AS T2
0029								CALCMAN2	0(CFF) = CONTINUE MANEUVER
0030								NEWANGL +1	1(CN) = START MANEUVER
THE FOUR SELECTABLE FREE FALL MANEUVER RATES SELECTED BY LOADING RATEINDEX WITH 0,2,4,6, RESPECTIVELY									
0031					22,2771	02221	0	ARATE	2DFC
0031					22,2772	24255	0		.0088888888
0032					22,2773	00554	0		= 0.2 DEG/SEC
0032					22,2774	02661	0		\$ 22.5 DEG/SEC
0033					22,2775	02660	0		.0222222222
0033					22,2776	13311	1		= 0.5 DEG/SEC
0034					22,2777	16161	0		\$ 22.5 DEG/SEC
0034					22,2777	16161	0		.0888888888
0034					22,2777	16161	0		= 2.0 DEG/SEC
0035					22,2777	16161	0		\$ 22.5 DEG/SEC
0035					22,2777	16161	0		.4444444444
0035					22,2777	16161	0		= 10.0 DEG/SEC
0035					22,2777	16161	0		\$ 22.5 DEG/SEC
0035					22,2777	16161	0		.0001507349
0035					22,2777	16161	0		= 1000-15
0036									FUDGE FACTOR TO CONVERT MANEUVER ANGLE TO MANEUVER TIME

L KALCMANU STEERING

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R0001 GENERATION OF STEERING COMMANDS FOR DIGITAL AUTOPILOT FREE FALL MANEUVERS

R0003 NEW COMMANDS WILL BE GENERATED EVERY ONE SECOND DURING THE MANEUVER

0004	REF	1			56,1707		FRANK= TTEMP			
0005	REF	68	LAST	364	22,3003	0 4616 1	NEWDELPHI TC	BANKCALL	CHECK FOR AUTO STABILIZATION	
0006	REF	1			22,3004	54266 1	CADR	ISITALTO	ONLY	
0007	REF	56	LAST	333	22,3005	10 000 0	CCS	A		
0008	REF	3	LAST	364	22,3006	1 270 0	TCF	NCGC -2		
0009	REF	16	LAST	358	22,3007	0 6042 1	NEWANEL TC	INTPRET		
0010					22,3010	75160 1	AXC,1	AXC,2		
0011	REF	6	LAST	352	22,3011	03246 1		MIS	COMPUTE THE NEW MATRIX FROM S/C TO	
0012	REF	10	LAST	362	22,3012	02230 1		KEL	STABLE MEMBER AXES	
0013					22,3013	77624 1	CALL			
0014	REF	2	LAST	352	22,3014	44312 1		MXM3		
0015					22,3015	45575 1	VLCAC	STADR		
0016	REF	7	LAST	366	22,3016	50514 1	STCVL	MIS +12D	CALCULATE NEW DESIRED CDU ANGLES	
0017					22,3017	77626 0	STADR			
0018	REF	8	LAST	366	22,3020	50522 1	STCVL	MIS +6D		
0019					22,3021	77626 0	STADR			
0020	REF	5	LAST	366	22,3022	74530 1	STCRE	MIS		
0021					22,3023	45160 1	AXC,1	CALL		
0022	REF	10	LAST	366	22,3024	03246 1		MIS		
0023	REF	1			22,3025	44654 0		DCMTCDDU	PICK UP THE NEW CDU ANGLES FROM MATRIX	
0024					22,3026	77634 0	RTB			
0025	REF	1			22,3027	21621 1		V1ST02S		
0026	REF	1			22,3030	03304 0	STORE	NCDU	NEW CDU ANGLES	
0027					22,3031	77414 0	BCNCLR	EXIT		
0028	REF	2	LAST	365	22,3032	01215 0		CALCMAN2		
0029	REF	1			22,3033	45122 1		MANUSTAT	TO START MANEUVER	
0030	REF	14	LAST	364	22,3034	3 4752 0	CAF	TWO	+0 OTHERWISE	
0031	REF	1			22,3035	551261 1	INCRECDL TS	SPNDX		
0032	REF	2	LAST	366	22,3036	511261 0	INDEX	SPNDX		
0033	REF	9	LAST	364	22,3037	3 1676 1	CA	BCDU	INITIAL CDU ANGLES	
0034					22,3040	0 0006 1	EXTEND		OR PREVIOUS DESIRED CDU ANGLES	
0035	REF	3	LAST	366	22,3041	5 1261 0	INDEX	SPNDX		
0036	REF	2	LAST	366	22,3042	211703 0	MSU	NCDU		
0037					22,3043	0 0006 1	EXTEND			
0038	REF	4	LAST	365	22,2000		SETLCC	KALCMCN1		
0039					22,3044		BANK			
0040	REF	1			22,3044	7 3121 1	MP	DI/TAL		
0041	REF	57	LAST	366	22,3045	10 000 0	CCS	A	CONVERT TO 2S COMPLEMENT	
0042	REF	17	LAST	340	22,3046	6 4753 1	AD	CNE		
0043					22,3047	1 3051 1	TCF	+2		
0044					22,3050	4 0000 0	CCM			
0045	REF	4	LAST	366	22,3051	511261 0	INDEX	SPNDX		
0046	REF	1			22,3052	551640 0	TS	DELDCDU	ANGLE INCREMENTS TO BE ADDED TO	
0047	REF	5	LAST	366	22,3053	511261 0	INDEX	SPNDX	CDUXD, CDUYD, CDUZD EVERY TENTH SECOND	

L KALC MANU STEERING

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0040	RFF	3	LAST	366	22,3054	3 1713 1	CA	NCDU	BY LEM CAP
0045	RFF	6	LAST	366	22,3055	51'261 0	INDEX	SPNDX	
0050	RFF	10	LAST	366	22,3056	57'676 1	XCH	RCDU	
0051	RFF	7	LAST	367	22,3057	51'261 0	INDEX	SPNDX	
0052	RFF	7	LAST	367	22,3060	55'635 1	TS	CFUXC	
0053	RFF	8	LAST	367	22,3061	11'261 1	CCS	SPNDX	
0054	RFF	1			22,3062	1 3735 0	TCF	INCRDDU	LOOP FOR THREE AXES
0055					22,3063	0 0013 1	RELINT		

RG056 COMPARE PRESENT TIME WITH TIME TO TERMINATE MANEUVER

0057	RFF	1			22,3064	0 3075 0	TMANLCHK	TC	TIMECHK	
0058	RFF	1			22,3065	1 3170 0	TCF	CENTMANL		
0059	RFF	18	LAST	366	22,3066	3 4753 1	CAF	CAF		
0060					22,3067	0 0004 0	MANLSTAL	INHINT		END MAJOR PART OF MANEUVER WITHIN 1 SEC
0061	RFF	13	LAST	364	22,3070	0 5203 0	TC	WAITLIST		UNDER WAITLIST CALL TO MANLSTCF
0062	RFF	2	LAST	366	56,1757		FRANK=	TTEMP		
0063	RFF	1			22,3071	02212 1	2CADR	MANLSTCF		
0063	RFF	1			22,3072	44366 1				
0064					22,3073	0 0003 1	RELINT			
0065	RFF	32	LAST	364	22,3074	1 5155 1	TCF	ENDOFJOB		

0066					22,3075	0 0006 1	TIMECHK	EXTEND		
0067	RFF	11	LAST	367	22,3076	4 0025 1	DCS	TIME2		
0068	RFF	3	LAST	367	22,3077	53'711 1	DXCH	TTEMP		
0069					22,3100	0 0006 1	EXTEND			
0070	RFF	2	LAST	365	22,3101	3 1734 0	DCA	TM		
0071	RFF	4	LAST	367	22,3102	21'711 1	CAS	TTEMP		
0072	RFF	5	LAST	367	22,3103	11'707 1	CCS	TTEMP		
0073	RFF	36	LAST	337	22,3104	0 0002 0	TC	Q		
0074					22,3105	1 3107 0	TCF	+2		
0075	RFF	1			22,3106	1 3117 1	TCF	2NDRETRN		
0076	RFF	6	LAST	367	22,3107	11'711 1	CCS	TTEMP +1		
0077	RFF	27	LAST	367	22,3110	0 0002 0	TC	Q		
0078	RFF	1			22,3111	1 3113 0	TCF	MANUEFF		
0079					22,3112	4 0000 0	CPM			
0080	RFF	1			22,3112	6 2166 0	MANLCEFF	AD	CNCEK +1	
0081					22,3114	0 0006 1	EXTEND			
0082	RFF	2	LAST	367	22,3115	6 3117 0	BZMF	2NDRETRN		
0083	RFF	38	LAST	367	22,3116	24 0002 0	INCR	Q		
0084	RFF	39	LAST	367	22,3117	24 0002 0	2NDRETRN	INCR	Q	
0085	RFF	41	LAST	367	22,3120	0 0002 0	TC	Q		

0086					22,3121	02146 1	DT/TAL	DEC	.1	
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0087					22,3122	77776 1	MANLSTAT	EXIT		INITIALIZATION ROUTINE
0088					22,3122	0 0006 1	EXTEND			FOR AUTOMATIC MANEUVERS
0089	RFF	12	LAST	367	22,3124	3 0025 0	DCA	TIME2		

L KALOMANL STEERING

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0090	REF	3	LAST	267	22,3125	21'734 1	CAS	TM	TM+T0	MANEUVER COMPLETION TIME
0091					22,3126	0 0006 1	EXTEND			
0092	REF	2	LAST	367	22,3127	4 3166 1	CCS	ONESEK		
0093	REF	4	LAST	368	22,3130	21'734 1	DAS	TM	(TM+T0)-1	
0094					22,3131	0 0004 0	INFINIT			
0095	REF	15	LAST	366	22,3132	3 4752 0	CAF	TWC		
0096	REF	2	LAST	126	22,3133	55'701 1	RATEBIAS	TS	KSPNDX	
0097					22,3134	6 0000 1	CCUBLE			
0098	REF	2	LAST	126	22,3135	55'702 1	TS	KCPNDX		
0099	REF	98	LAST	366	22,3136	50 000 1	INDEX	A		
0100	REF	2	LAST	365	22,3137	3 1725 0	CA	BRATE		
0101	REF	3	LAST	368	22,3140	51'701 0	INDEX	KSPNDX	STORE MANEUVER RATE IN	
0102	REF	4	LAST	196	22,3141	55'643 0	TS	OMEGAPD	OMEGAPD, OMEGAQC, OMEGAPD	
0103					22,3142	0 0006 1	EXTEND			
0104					22,3143	6 3145 1	BZME	+2	COMPUTE ATTITUDE ERROR	
0105					22,3144	4 0000 0	CCM		OFFSET = (W)ABS(W)/2AJX	
0106					22,3145	0 0006 1	EXTEND		WHERE AJX= 2-JET ACCELERATION	
0107	REF	1			22,3146	7 3167 0	MP	BIASCALE	= -1/16	
0108					22,3147	0 0006 1	EXTEND			
0109	REF	3	LAST	368	22,3150	5 1702 0	INDEX	KCPNDX		
0110	REF	3	LAST	368	22,3151	7 1725 1	MP	BRATE		
0111					22,3152	0 0006 1	EXTEND			
0112	REF	4	LAST	368	22,3153	5 1701 0	INDEX	KSPNDX		
0113	REF	5	LAST	124	22,3154	11'530 0	CV	1JACC	=AJX \$ 50 DEG/SEC-SEC	
0114	REF	5	LAST	366	22,3155	51'701 0	INDEX	KSPNDX		
0115	REF	1			22,3156	55'274 0	TS	DELPEROR	\$ 180 DEG	
0116	REF	6	LAST	366	22,3157	11'701 1	CCS	KSPNDX		
0117	REF	1			22,3160	1 3122 1	TCF	RATEBIAS		
0120	REF	3	LAST	335	22,3161	3 0025 0	CA	TIME1		
0121	REF	3	LAST	368	22,3162	6 3166 0	AC	CNESEK +1		
0122	REF	1			22,3163	57'706 1	XCH	NEXTIME		
0123	REF	2	LAST	367	22,3164	1 3034 1	TCF	INCRDCCU -1		
0124					22,3165	00000 1	CNESEK	DEC	0	
0125					22,3166	00144 0	DEC		100	
0126					22,3167	75777 1	BIASCALE	CCT	75777	= -1/16
0127	REF	4	LAST	368	22,3170	4 0025 1	CONTMANL	CS	TIME1	RESET FOR NEXT CCU UPDATE
0128	REF	2	LAST	368	22,3171	6 1706 1	AC	NEXTIME		
0129	REF	99	LAST	366	22,3172	10 000 0	CCS	A		
0130	REF	19	LAST	367	22,3173	6 4753 1	AD	ONE		
0131	REF	1			22,3174	1 3177 1	TCF	MANUCALL		
0132	REF	1			22,3175	6 4725 1	AC	NEGMX		
0133					22,3176	4 0000 0	CCM			
0134					22,3177	0 0004 0	MANUCALL	INFINIT		CALL FOR NEXT UPDATE VIA WAITLIST
0135	REF	14	LAST	367	22,3200	0 5203 0	TC	WAITLIST		
0136	REF	7	LAST	367	22,3201	0 5203 0	EBANK=	TTEMP		
0137	REF	1			22,3202	0 5203 0	2CADP	UPDCALL		
0137	REF	1			22,3202	44066 1				

L KALCMANL STEERING

LSEIR'S PAGE NO. 4 E6 S3

0138	REF	4	LAST	368	22,32.2	3 3166 0	CAF	CNESPCK +1	INCREMENT TIME FOR NEXT UPDATE
0139	REF	3	LAST	368	22,32.4	27.716 0	ADS	NEXTIME	
0140	REF	33	LAST	367	22,32.5	1 5155 1	TCF	ENDCFJOB	
0141	REF	1			22,32.6	2 7717 1	UPDTCALL	CAF	PRIC26
0142	REF	13	LAST	368	22,32.7	1 5105 0	TC	FINDVAC	SATELLITE PROGRAM TC CALL FOR UPDATE
0143	REF	8	LAST	368	26,17.7		FRANK=	TIME	OF STEERING COMMANDS
0144	REF	1			22,32.0	20.2 1	2CADR	NEWDELHI	
0144	REF	1			22,32.11	44066 1			
0145	REF	5	LAST	283	22,32.12	0 5261 1	TC	TASKOVER	

L KALCMANU STEERING

USER'S PAGE NO. 5 EE S3

PD146 ROUTINE FOR TERMINATING AUTOMATIC MANEUVERS

0147	REF	39	LAST	337	22,3213	3 4755 1	MANUSTOP	CAF	ZERO	ZERO MANEUVER RATES
0148	REF	1			22,3214	55'642 1		TS	DELDCCU2	
0149	REF	1			22,3215	55'645 0		TS	OMEGAPD	
0150	REF	1			22,3216	55'275 1		TS	DELPEROP	
0151	REF	1			22,3217	55'641 1		TS	DELDCCU1	
0152	REF	1			22,3220	55'644 1		TS	OMEGACD	
0153	REF	1			22,3221	55'275 1		TS	DELGEROP	
0154	REF	2	LAST	352	22,3222	3 0322 0		CA	CPSI	SET DESIRED GIMBAL ANGLES TO
0155	REF	1			22,3223	55'637 0		TS	CDUZO	DESIRED FINAL GIMBAL ANGLES
0156	REF	1			22,3224	3 0322 1		CA	CTHETA	
0157	REF	1			22,3225	55'636 1		TS	CDLYD	
0158	REF	4	LAST	353	22,3226	3 0321 1	ENDPCLL	CA	CPHI	NO FINAL YAW
0159	REF	8	LAST	367	22,3227	55'625 1		TS	CDLXD	
0160	REF	40	LAST	370	22,3230	3 4755 1		CAF	ZERO	
0161	REF	5	LAST	368	22,3231	55'643 0		TS	OMEGAPD	I.E. MANEUVER DID NOT GO THRU
0162	REF	2	LAST	366	22,3232	55'640 0		TS	DELDCCU1	GIMBAL LOCK ORIGINALLY
0163	REF	2	LAST	368	22,3233	55'274 0		TS	DELPEROP	
0164	REF	1			22,3234	3 1306 0	GOODMAN	CA	ATTPRIC	RESTORE USERS PRIO
0165	REF	2	LAST	233	22,3235	54 063 0		TS	NEWPRIC	
0166	REF	41	LAST	370	22,3236	3 4755 1		CA	ZERO	ZERO ATTICDR
0167	REF	3	LAST	223	22,3237	53'305 1		EXCH	ATTICDR	
0168	REF	2	LAST	233	22,3240	0 5116 1		TC	SPVAC	RETURN TO USER
0169	REF	6	LAST	369	22,3241	0 5261 1		TC	TASKOVER	

L SYSTEM TEST STANDARD LEAD INS

LSFP'S PAGE NO. 1 EO S3

0001 REF 4 LAST 321 ER,1442 FBANK= XSM

0002 33,2045 BANK 33

0003 REF 1 04,2000 SETLCC F/PROG

0004 04,2560 BANK

0005 REF 1 COUNT# 33/P07

R0006 SPECIAL PROGRAMS TO EASE THE PAINS OF ERASABLE MEMORY PROGRAMS.

R0007 F/BKCALL FOR DOING BANKCALLS FROM AND RETURNING TO ERASABLE.

R0008 THIS ROUTINE IS CALLABLE FROM ERASABLE OR FIXED. LIKE BANKCALL, HOWEVER, SWITCHING BETWEEN S3 AND S4

R0010 IS NOT POSSIBLE.

R0011 THE CALLING SEQUENCE IS:

A0012 TC BANKCALL

A0013 CADR F/BKCALL

A0014 CADR ROUTINE WHERE YOU WANT TO GO IN FIXED.

A0015 RETURN HERE FROM DISPLAY TERMINATE, BAD STALL OR TC Q.

A0016 RETURN HERE FROM DISPLAY PROCEED OR GOOD RETURN FROM STALL.

A0017 RETURN HERE FROM DISPLAY ENTER OR RECYCLE.

R0018 THIS ROUTINE REQUIRES TWO ERASABLES (ERUF2, +1) IN UNSWITCHED WHICH ARE UNSHARED BY INTERRUPTS AND

R0020 OTHER EMERGENCY PROGRAMS.

R0021 A + L ARE PRESERVED THROUGH BANKCALL AND F/BKCALL.

0022 REF 3 LAST 245 04,2560 52 134 0 F/BKCALL EXCH ERUF2 SAVE A,L AND GET CP RETURN.

0023 REF 1 04,2561 53 167 1 EXCH ERUF2 SAVE CP RETURN.

0024 REF 2 LAST 371 04,2562 25 166 1 INCR ERUF2 RETURN +1 BECAUSE DOUBLE CADR.

0025 REF 1 LAST 155 04,2563 2 0006 1 CA BRANK

0026 REF 3 LAST 305 04,2564 7 512 0 MASK LCW10 GET CURRENT FBANK. (FBANK SAME DAY)

0027 REF 2 LAST 371 04,2565 27 167 1 ADS ERUF2 +1 FORM BECCN. (WAS FBANK)

0028 REF 4 LAST 371 04,2566 51 166 1 NDY ERUF2

0029 04,2567 2 7777 0 CA 0 -1 GET CADR OF ROUTINE.

0030 REF 2 LAST 218 04,2570 0 4622 0 TC SWCALL GO TO ROUTINE, SETTING G TO SWRETURN

ACC31 AND RESTORING A + 1.

0032 04,2571 0 2575 1 TC +4 TX G, V34, CP BAD STALL RETURN.

0033 04,2572 0 2574 1 TC +2 PROCEED OR GOOD STALL RETURN.

0034 REF 5 LAST 371 04,2573 25 166 1 INCR ERUF2 ENTER OR RECYCLE RETURN.

0035 REF 6 LAST 371 04,2574 25 166 1 INCR ERUF2

0036 REF 7 LAST 371 04,2575 53 167 1 F/SWITCH EXCH ERUF2

0037 04,2576 52 036 0 CTCP

L SYSTEM TEST STANDARD LEAD INS

USER'S PAGE NO. 2 E5 S3

P0038 F/CALL FOR CALLING A FIXED MEMORY INTERPRETIVE SUBROUTINE FROM ERASABLE AND RETURNING TO ERASABLE.

R0040 THE CALLING SEQUENCE IS...

A0041							RTR			
A0042							CADR	F/CALL		
A0043								ROUTINE		THE INTERPRETIVE SUBROUTINE YOU WANT.
A0044										RETURNS HERE IN INTERPRETIVE.
0045	REF	1			04,2577	22 164 1	F/CALL	LXCF	LCC	ADDRESS -1 OF CADR.
0046	REF	23	LAST	337	04,2600	50 001 0		INDEX	L	
0047	REF	34	LAST	372	04,2601	3 0001 0		CA	L	CADR IN A.
0048	REF	35	LAST	372	04,2602	24 001 0		INCR	L	
0049	REF	36	LAST	372	04,2603	24 001 0		INCR	L	RETURN ADDRESS IN L.
0050	REF	8	LAST	371	04,2604	53 167 1		EXCF	EBUF2	STORE CADR AND RETURN.
0051	REF	17	LAST	366	04,2605	0 6042 1		TC	INTPRET	
0052					04,2606	77624 1		CALL		
0053	REF	9	LAST	372	04,2607	01166 1			EBUF2	INDIRECTLY EXECUTE ROUTINE. IT MUST
0054					04,2610	77776 1		EXIT		LEAVE VIA RVC OR EQUIVALENT.
0055	REF	10	LAST	372	04,2611	23 167 0		LXCF	EBUF2 +1	PICK UP RETURN.
0056	REF	18	LAST	372	04,2612	1 6044 0		TCF	INTPRET +2	SET LCC AND RETURN TO CALLER.

L SYSTEM TEST STANDARD LEAD IN

USER'S PAGE NO. 3 E5 S3

R0057 E/JOBWAK FOR WAKING UP EPASABLE MEMORY JOBS.

R0058 THIS ROUTINE MUST BE CALLED IN INTERRUPT OR WITH INTERPRETS INHIBITED.

R0060 THE CALLING SEQUENCE IS:

A0061				INHINT	
A0062				.	
A0063				.	
A0064				CA	WAKEADR ADDRESS OF SLEEPING JOB
A0065				TC	IBNKCALL
A0066				CADR	E/JOBWAK
A0067				.	RETURNS HERE
A0068				.	
A0069				.	
A0070				RELINT	IF YOU DID AN INHINT.

0071				33,2045		BANK	33
0072	REF	2	LAST	371	04,2010	SETLCC	E/PROC
0073					04,2613	BANK	

0074	REF	2	LAST	371	TC	373:	27	27*	CCUNT*	\$1/P07
------	-----	---	------	-----	----	------	----	-----	--------	---------

0075	REF	1			04,2613	0	5137	I	E/JOBWAK	TC	JOBWAKE	ARRIVE WITH ADRES IN A.
0076	REF	17	LAST	256	04,2614	4	4741	C		CS	RIT11	
0077	REF	1			04,2615	50	064	C		NDX	LCCCTR	
0078	REF	2	LAST	372	04,2616	26	164	0		ADS	LCC	KNCK FIXED MEMORY BIT OUT OF ADRES.
0079	REF	1			04,2617	0	0072	1		TC	RUPTRFG3	RETURN

L 1MU PERFORMANCE TESTS 2

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R0001 NAME- 1MU PERFORMANCE TESTS 2

R0002 DATE- MARCH 20, 1967

R0003 BY- SYSTEM TEST GROUP 864-6900 EXT. 1274

R0004 MODNO.- ZERO

R0005 FUNCTIONAL DESCRIPTION

R0006 POSITIONING ROUTINES FOR THE 1MU PERFORMANCE TESTS AS WELL AS SOME OF
 R0007 THE TESTS THEMSELVES. FOR A DESCRIPTION OF THESE SUBROUTINES AND THE
 R0008 OPERATING PROCEDURES (TYPICALLY) SEE STG MEMO 685, THEORETICAL REF. E-1973

0009					33,2045			BANK	33
0010	REF	2	LAST	44	37,2000			SFTLCC	1MU2
0011					37,2002			BANK	
0012	REF	2	LAST	128	55,1416			EBANK=	POSITION
00121	REF	2	LAST	44 TO	44:	2	2*	COUNT#	\$/P07
00122	REF	1			37,2002	0 5311	1	RECO	TC NEWMODEX
00124					37,2003	00007	0	MM	07
0021	REF	1			37,2004	0 2325	1	GEO1MUTT	TC 1MUZFRR
0022	REF	42	LAST	370	37,2005	3 4755	1	1MUBACK	CA ZFRD
0023	REF	2	LAST	128	37,2006	55,414	0	TS	NDXCTR
0024	REF	1			37,2007	55,440	1	TS	TCRQNDX
0025	REF	2	LAST	374	37,2010	55,441	0	TS	TCRQNDX +1
00251	REF	1			37,2011	55,576	0	TS	OVFLOWCK
0026	REF	1			37,2012	3 4361	1	NEPOSPL	CA DEC17
0027	REF	1			37,2013	55,571	1	TS	ZFRQNDX
0028	REF	1			37,2014	3 2476	0	CA	XNBADR
0029	REF	1			37,2015	0 2367	1	TC	ZFRQING
0030	REF	2	LAST	335	37,2016	3 4736	1	CA	HALF
0031	REF	1			37,2017	55,664	0	TS	XNB
0032	REF	19	LAST	372	37,2020	0 6042	1	GUESS	TC INTPRET
0033					37,2021	62545	1	LATAZCHK	DLCAD SL2
0034	REF	2	LAST	128	37,2022	02403	1		LATITUDE
0035	REF	13	LAST	218	37,2023	15046	1	STCDL	DSPTM1 +1
0036	REF	2	LAST	128	37,2024	02401	0		AZIMUTH
0037					37,2025	77434	1	RTB	EXIT
0038	REF	1			37,2026	21615	0		1STC2S
0039	REF	68	LAST	358	37,2027	56 154	1	XCF	MPAC
0040	REF	14	LAST	374	37,2030	55,044	1	TS	DSPTM1
0041	REF	1			37,2031	3 2472	0	CAF	VN0641
0042	REF	69	LAST	366	37,2032	0 4616	1	TC	BANKCALL
0043	REF	4	LAST	341	37,2033	20477	1	CADR	GCFLASH
0044	REF	1			37,2034	0 2270	0	TC	ENDTEST1
0045					37,2035	0 2037	1	TC	+2
0046					37,2036	0 2031	1	TC	-5

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0047	REF	20	LAST	374	37,2037	0 6042 1	TC	INTPRET	
0048					37,2040	47135 0	SLCAD	RTF	
0049	REF	15	LAST	374	37,2041	01045 1		DSPTM1	
0050	REF	10	LAST	358	37,2042	21577 1		CELLCGIC	
0051	REF	3	LAST	374	37,2043	02401 0	STCRF	AZIMUTH	
0052					37,2044	60535 1	SLCAD	SR2	
0053	REF	16	LAST	375	37,2045	01246 1		DSPTM1 +1	
0054	REF	3	LAST	374	37,2046	02403 1	STORE	LATITUDE	
0055					37,2047	57546 1	CCS	DECOMP	
0056					37,2050	77752 1	SL1		
0057	REF	1			37,2051	16437 0	STCCL	WANGI	
0058	REF	4	LAST	375	37,2052	02403 1		LATITUDE	
0059					37,2053	72556 1	SIN	SL1	
0060	REF	1			37,2054	16435 1	STCCL	WANGP	
0061	REF	4	LAST	375	37,2055	02401 0		AZIMUTH	
0062					37,2056	73406 1	PUSH	SIN	
0063	REF	1			37,2057	02675 1	STORE	YAP +2	
0064	REF	1			37,2060	16705 1	STCCL	ZNB +4	
0065					37,2061	77746 1	COS		
0066	REF	2	LAST	375	37,2062	72677 0	STCRF	YAP +4	
0067					37,2063	77676 0	DECOMP		
0068	REF	2	LAST	375	37,2064	35703 0	POSEMBL	STCALL	ZNB +2
0069	REF	1			37,2065	47355 1		CALCGA	
0070					37,2066	77776 1	EXIT		
0071	REF	70	LAST	374	37,2067	0 4616 1	TC	BANKCALL	
0072	REF	2	LAST	268	37,2070	16772 1	CADR	IMLCCARS	
0073	REF	35	LAST	294	37,2071	3 4736 1	CAP	BIT14	IF BIT14 SET, GIMBAL LOCK
0074	REF	9	LAST	281	37,2072	7 0177 0	MASK	FLAGWPC3	
0075					37,2073	0 0006 1	EXTEND		
0076					37,2074	1 2076 0	BZF	+2	
0077	REF	3	LAST	374	37,2075	251414 1	INCR	NDXCTR	+1 IF IN GIMBAL LOCK, OTHERWISE 0
0078	REF	31	LAST	341	37,2076	0 5516 0	TC	DCWNFLAG	
0079	REF	2	LAST	230	37,2077	00056 1	ACRES	GLCKFAIL	RESET GIMBAL LOCK FLAG
0080	REF	1			37,2100	0 2315 1	TC	IMLSLLG	
0081	REF	4	LAST	375	37,2101	111414 0	CCS	NDXCTR	IF ONE GC AND CC A PIPA TEST ONLY
0082	REF	1			37,2102	0 2126 0	TC	PIPACHK	ALIGN AND MEASURE VERTICAL PIPA RATE
0084	REF	1			37,2103	0 2320 1	TC	FINIMLDD	
0085					37,2104	0 0006 1	EXTEND		
00851	REF	1			37,2105	3 1575 1	DCA	PERFDLAY	
00852	REF	1			37,2106	0 5277 0	TC	LCNGCALL	DELAY WHILE SUSPENSION STABILIZES
008525	REF	2	LAST	374	05,1416		EBANK=	POSITION	
00853	REF	1			37,2107	02113 0	2CADR	GCSTIMS	
00854	REF	1			37,2110	76065 0			
00854	REF	1			37,2111	3 2116 0	CA	ESTICADR	
00855	REF	1			37,2112	0 5133 0	TC	JCPSLEEP	
00856	REF	2	LAST	375	37,2113	3 2116 0	GCSTIMS	CA	ESTICADR
00857	REF	2	LAST	373	37,2114	0 5137 1	TC	JCEWAKE	
00858	REF	7	LAST	370	37,2115	0 5261 1	TC	TASKOVER	
00859	REF	1			37,2116	76500 0	ESTICADR	CADR	ESTIMS
0086	REF	42	LAST	374	37,2117	3 4755 1	TCRQLF	CA	ZFRC

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0087	REF	7	LAST	318	37,2120	55'047 1	TS	CSPTM2	
0088	REF	1			37,2121	3 1504 1	CA	DRIFT1	
0089	REF	8	LAST	376	37,2122	55'050 1	TS	DSPTM2 +1	
0090	REF	4	LAST	375	37,2123	51'416 0	INDEX	PCSITON	
0091	REF	2	LAST	128	37,2124	55'420 1	TS	SCUTHDR -1	
0092	REF	1			37,2125	0 2457 0	TC	SHOW	
0093	REF	5	LAST	375	37,2126	51'414 1	PIPACHK	INDEX	NDXCTR
0094					37,2127	0 2133 1	TC	+1	PIPA TEST
0095	REF	1			37,2130	0 2447 1	TC	EARTHR*	
0096	REF	2	LAST	374	37,2131	3 4361 1	CA	DFC17	ALLOW PIP COUNTER TO OVERFLOW 17 TIMES
0097	REF	1			37,2132	55'476 1	TS	DATAPL +4	IN THE ALLCIED TIME INTERVAL
0098	REF	1			37,2133	3 2474 1	CA	DEC58	
0099	REF	2	LAST	128	37,2134	55'412 0	TS	LENGTHCT	
0100	REF	20	LAST	368	37,2135	3 4753 1	CA	ONE	
0101	REF	1			37,2136	55'527 0	TS	RESULTCT	
0102	REF	44	LAST	375	37,2137	3 4755 1	CA	ZERC	
0103	REF	2	LAST	128	37,2140	51'415 0	INDEX	PIPINDEX	
0104	REF	2	LAST	376	37,2141	54 037 1	TS	PIPA*	
0105	REF	2	LAST	376	37,2142	55'472 0	TS	DATAPL	
0106	REF	1			37,2143	0 2332 1	TC	CHECKG	
0107					37,2144	0 0004 0	INHINT		
0108	REF	16	LAST	368	37,2145	3 4752 0	CAF	TWO	
0109	REF	1			37,2146	0 5173 1	TC	TWIDDLE	
0110	REF	5	LAST	371	55,1642		FBANK=	XSM	
0111	REF	1			37,2147	02151 0	ADRES	PIPATASK	
0112	REF	24	LAST	369	37,2150	0 5155 0	TC	ENDCFJCB	
0113					37,2151	0 0006 1	PIPATASK	EXTEND	
0114	REF	3	LAST	376	37,2152	27'412 0	TC	LENGTHCT	
0115	REF	4	LAST	376	37,2153	3 1412 1	CA	LENGTHCT	
0116					37,2154	0 0006 1		EXTEND	
0117	REF	1			37,2155	6 2161 0	BZMF	STARTPIF	
0118	REF	19	LAST	335	37,2156	3 4742 1	CAF	BIT10	
0119	REF	2	LAST	376	37,2157	0 5173 1	TC	TWIDDLE	
0120	REF	6	LAST	376	55,1642		FBANK=	XSM	
0121	REF	2	LAST	376	37,2160	02151 0	ADRES	PIPATASK	
0122	REF	2	LAST	265	37,2161	3 4736 1	STARTPIF	CAF	PFID20
0123	REF	14	LAST	369	37,2162	0 5105 0	TC	FINDVAC	
0124	REF	7	LAST	376	55,1642		FBANK=	XSM	
0125	REF	1			37,2163	02166 1	2CADR	PIFJCBP	
0125	REF	1			37,2164	0 76065 0			
0126	REF	8	LAST	375	37,2165	0 5251 1	TC	TASKCOVER	
0127	REF	6	LAST	376	37,2166	51'414 1	PIPJCBB	INDEX	NDXCTR
0128					37,2167	0 2170 0	TC	+1	
0129	REF	2	LAST	376	37,2170	0 2447 1	TC	EARTHR*	
0130	REF	5	LAST	376	37,2171	3 1412 1	CA	LENGTHCT	

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0131					37,2172	0 0006 1	EXTEND	
0132					37,2173	6 2175 0	BZMF +2	
0133	REF	35	LAST	376	37,2174	0 5155 0	TC	ENDQFJ03
0134	REF	7	LAST	261	37,2175	2 4756 1	CA	FIVE
0135	REF	2	LAST	376	37,2176	55'537 0	TS	RESULTCT
0136	REF	2	LAST	376	37,2177	0 2332 1	TC	CHECKG
0137	REF	3	LAST	376	37,2200	11'472 1	CCS	DATAPL +1
0138					37,2201	0 2205 1	TC	+4
0139	REF	1			37,2202	0 5675 0	TC	CCSHCLE
0140	REF	4	LAST	377	37,2203	4 1476 1	CS	DATAPL +4
0141	REF	5	LAST	377	37,2204	55'476 1	TS	DATAPL +4
0142					37,2205	0 0006 1	EXTEND	
0143	REF	6	LAST	377	37,2206	4 1473 1	DCS	DATAPL
0144	REF	7	LAST	377	37,2207	21'477 1	CAS	DATAPL +4
0145	REF	21	LAST	375	37,2210	0 6042 1	TC	INTPRET
0146					37,2211	45345 1	CLCAD	DSU
0147	REF	8	LAST	377	37,2212	02501 1		DATAPL +6
0148	REF	9	LAST	377	37,2213	02475 0		DATAPL +2
0149					37,2214	45044 0	BPL	CALL
0150	REF	1			37,2215	76217 1		AINGCTN
0151	REF	1			37,2216	76275 0		CVEPFFIX
0152					37,2217	56325 0	AINGCTN	PCDL
0153	REF	10	LAST	377	37,2220	02477 1		DATAPL +4
0154					37,2221	47075 0	DMRP	RTP
0155	REF	1			37,2222	37156 0		DEC585
0156	REF	1			37,2223	21613 0		SGNAGREE
0157	REF	9	LAST	376	37,2224	01050 0	STORE	DSRTM2
0158					37,2225	77776 1	EXIT	
0159	REF	7	LAST	376	37,2226	11'414 0	CCS	NDXCTR
0160	REF	1			37,2227	0 2311 1	TC	CCAALIGN
0161	REF	2	LAST	376	37,2230	0 2457 0	TC	SHCW
0162	REF	1			37,2231	3 2471 1	VERTCRFT	CA
0163	REF	6	LAST	376	37,2232	55'412 0	TS	3590DEC
0164	REF	5	LAST	376	37,2233	51'416 0	INDEX	LENGTHOT
0165	REF	3	LAST	376	37,2234	4 1417 0	CS	PCSTICN
0166	REF	1			37,2235	55'442 0	TS	SCOUTHDR -2
01661	REF	3	LAST	376	37,2236	11'415 1	CCS	DRIFTT
01662	REF	1			37,2237	1 2245 1	CCS	PIPINDEX
01663	REF	19	LAST	371	37,2240	4 4747 0	TCF	PCN4
01664	REF	1			37,2241	27'565 1	CS	RIT5
01665	REF	20	LAST	377	37,2242	2 4747 1	ADS	EPCOMP +2
01666	REF	2	LAST	377	37,2243	27'567 0	CA	RIT5
01667	REF	1			37,2244	1 2251 1	ADS	ERCOMP +4
01668	REF	21	LAST	377	37,2245	4 4747 0	TCF	PCN
01669	REF	3	LAST	377	37,2246	27'565 1	CS	BIT5
016691	REF	22	LAST	377	37,2247	3 4747 1	ADS	ERCOMP +2
016692	REF	4	LAST	377	37,2250	27'563 1	CA	BIT5
0167	REF	3	LAST	376	37,2251	0 2447 1	ADS	ERCOMP
							TC	EARTH*

DEC585 HAS BEEN REDEFINED FOR LEM

TAKE PLATFORM OUT OF GIMBAL LOCK

ABOUT 1 HOUR VERTICAL DRIFT TEST

OFFSET PLATFORM TO MISS FIF DEAD-ZONES

Z UP IN POS 4

X UP

L IMU PERFORMANCE TESTS 2

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TEST ID	REF	TYPE	TIME	COORD X	COORD Y	COORD Z	COORD W	COORD V	COORD U	COORD T	COORD S	COORD R	COORD Q	COORD P	COORD O	COORD N	COORD M	COORD L	COORD K	COORD J	COORD I	COORD H	COORD G	COORD F	COORD E	COORD D	COORD C	COORD B	COORD A
0168	REF	45	LAST	376	37,2252	3 4755	1	CA	ZERO	ALLOW ONLY SCUTH GYRO EARTH RATE COMPENS																			
0169	REF	2	LAST	128	37,2253	55'404	1	TS	ERVECTOR																				
0170	REF	3	LAST	378	37,2254	55'405	0	TS	ERVECTOR +1																				
0171	REF	4	LAST	220	37,2255	3 4733	1	GLESS1	CAF	PCSMAX																			
0172	REF	3	LAST	374	37,2256	55'440	1	TS	TCRQNDX																				
0173	REF	4	LAST	378	37,2257	55'441	0	TS	TCRQNDX +1																				
0174	REF	8	LAST	358	37,2260	3 0032	0	CA	CDLX																				
0175	REF	2	LAST	128	37,2261	55'413	1	TS	LOSVEC																				
0176	REF	2	LAST	375	37,2262	0 2500	0	TC	ESTIMS																				
0177	REF	1			37,2263	3 1502	1	VALMIS	CA	DRIFTC																			
0178	REF	10	LAST	377	37,2264	55'050	1	TS	DSPTM2 +1																				
0179	REF	46	LAST	378	37,2265	3 4755	1	CA	ZERO																				
0180	REF	11	LAST	378	37,2266	55'047	1	TS	DSPTM2																				
0181	REF	2	LAST	377	37,2267	0 2457	0	TC	SFCW																				
0182	REF	32	LAST	375	37,2270	0 5516	0	ENDTEST1	TC	DOWNFLAG																			
0183	REF	3	LAST	288	37,2271	00007	0	ADRES	IMLSP																				
0184	REF	47	LAST	378	37,2272	4 4755	0	CS	ZERO																				
0185	REF	2	LAST	233	37,2273	0 5214	1	TC	NEWMODEA																				
0186	REF	29	LAST	341	37,2274	0 5472	0	TC	ENDEXT																				

L IMU PERFORMANCE TESTS 2

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0187					37,2275	43215	0	OVERFFIX	EAE	DAD
0188	REF	3	LAST	301	37,2276	06532	0			DEFOSSMAX
0189	REF	1			37,2277	37064	1			DNEDFP
0190					37,2300	77516	0		RVQ	

0191					37,2301	0 0006	1	COAALION	EXTEND	COARSE ALIGN SUBROUTINE
0192	REF	2	LAST	374	37,2302	23'571	0		GXCH	ZERONDX
0193	REF	48	LAST	375	37,2303	3 4755	1		CA	ZERO
0194	REF	7	LAST	306	37,2304	54 221	0		TS	THETAC
0195	REF	8	LAST	379	37,2305	54 322	0		TS	THETAC +1
0196	REF	5	LAST	375	37,2306	54 223	1		TS	THETAC +2
0197	REF	71	LAST	375	37,2307	0 4616	1		TC	BANKCALL
0198	REF	3	LAST	375	37,2310	16772	1		CADR	IMUCOARS
0199	REF	72	LAST	375	37,2311	0 4616	1	ALIGNCCA	TC	BANKCALL
0200	REF	7	LAST	334	37,2312	17710	1		CADR	IMUSTALL
0201	REF	1			37,2313	0 3047	1		TC	SCMERR2
0202	REF	3	LAST	375	37,2314	0 1571	0		TC	ZERONDX

0203					37,2315	0 0306	1	IMUSLLLC	EXTEND	
0204	REF	4	LAST	375	37,2316	23'571	0		GXCH	ZERONDX
0205	REF	1			37,2317	0 2311	0		TC	ALIGNCCA

0206					37,2320	0 0006	1	FINIMUCC	EXTEND	
0207	REF	5	LAST	375	37,2321	23'571	0		GXCH	ZERONDX
0208	REF	73	LAST	375	37,2322	0 4616	1		TC	BANKCALL
0209	REF	2	LAST	274	37,2323	17202	1		CADR	IMUFIN
0210	REF	2	LAST	375	37,2324	0 2311	0		TC	ALIGNCCA

0211					37,2325	0 0006	1	IMUZERR	EXTEND	
0212	REF	6	LAST	375	37,2326	23'571	0		GXCH	ZERONDX
0213	REF	74	LAST	375	37,2327	0 4616	1		TC	BANKCALL
0214	REF	3	LAST	265	37,2330	16706	1		CADR	IMUZERO
0215	REF	3	LAST	375	37,2331	0 2311	0		TC	ALIGNCCA

0216					37,2332	0 0006	1	CHECKC	EXTEND	PIP PULSE CATCHING ROUTINE
0217	REF	4	LAST	291	37,2333	23'417	1		GXCH	QPLACE
0218					37,2334	0 2342	0		TC	+6
0219					37,2335	0 3013	1	CHECKC1	RELINT	
0220	REF	2	LAST	222	37,2336	3 0067	0		CA	NEWJOB
0221					37,2337	0 2034	1		EXTEND	
0222					37,2340	6 2346	1		RZMF	+6
0223	REF	1			37,2341	0 5122	0		TC	CFANG1
0224					37,2342	0 3004	0		INHINT	
0225	REF	4	LAST	377	37,2343	51'415	0		INDEX	PIPINDEX
0226	REF	3	LAST	376	37,2344	4 0037	1		CS	PIPAX
0227	REF	7	LAST	375	37,2345	55'571	1		TS	ZERONDX
0228					37,2346	0 3004	0		INHINT	

L IMU PERFORMANCE TESTS 2

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0229	REF	5	LAST	379	37,2347	51'415 J	INDEX	PIPINDEX
0230	REF	4	LAST	379	37,2350	3 0037 0	CA	PIPAX
0231	REF	8	LAST	379	37,2351	6 1571 0	AD	ZERONDX
0232					37,2352	0 0006 1	EXTEND	
0233	REF	1			37,2353	1 2335 1	PZF	CHECKG1
0234	REF	6	LAST	380	37,2354	51'415 0	INDEX	PIPINDEX
0235	REF	5	LAST	380	37,2355	3 0037 0	CA	PIPAX
0236	REF	3	LAST	377	37,2356	51'537 1	INDEX	RESULTCT
0237	REF	11	LAST	377	37,2357	55'472 0	TS	DATAPL
0238	REF	1			37,2360	0 4102 0	TC	FINFTIME
0239	REF	4	LAST	380	37,2361	51'537 1	INDEX	RESULTCT
0240	REF	12	LAST	380	37,2362	55'473 1	TS	DATAPL +1
0241	REF	5	LAST	380	37,2363	51'537 1	INDEX	RESULTCT
0242	REF	13	LAST	380	37,2364	23'474 1	LXCH	DATAPL +2
0243					37,2365	0 0003 1	RELINT	
0244	REF	5	LAST	379	37,2366	0 1417 1	ENDCHKG TC	GPLACE
0245	REF	37	LAST	372	37,2367	54 001 1	ZEROING TS	L
0246					37,2370	1 2372 1	TCF	+2
0247	REF	9	LAST	380	37,2371	55'571 1	ZEROING1 TS	ZERONDX
0248	REF	49	LAST	379	37,2372	3 4755 1	CAF	ZERO
0249	REF	38	LAST	380	37,2373	50 001 0	INDEX	L
0250					37,2374	54 001 0	TS	0
0251	REF	36	LAST	380	37,2375	24 001 0	INCR	L
0252	REF	10	LAST	380	37,2376	11'571 1	CCS	ZERONDX
0253	REF	1			37,2377	1 2371 1	TCF	ZEROING1
0254	REF	41	LAST	367	37,2400	0 0002 0	TC	G

L TNU PERFORMANCE TESTS 2

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0258				37,2411	65345 0	EPTRVSE	CLCAD	PDDL			
0259	REF	1		37,2402	37057 1			SCHZERCS	PD24 = (S1N	-CCS	01)(OMEG/MS)
0260	REF	5	LAST	37,2403	02403 1			LATITLDE			
0261				37,2404	57546 1		CCS	CCCMP			
0262				37,2405	72525 1		PDDL	SIN			
0263	REF	6	LAST	37,2406	02403 1			LATITUDE			
0264				37,2407	74266 0		VDEF	VXSC			
0265	REF	1		37,2410	36001 0			OMEG/MS			
0266	REF	4	LAST	37,2411	02405 1		STORE	FRVECTOR			
0267				37,2412	77634 0		RTB				
0268	REF	3	LAST	37,2413	21574 1			LCADTIME			
0269	REF	2	LAST	37,2414	26433 1		STCVL	TMARK			
0270	REF	2	LAST	37,2415	37057 1			SCHZERCS			
0271	REF	5	LAST	37,2416	02564 1		STORE	ERCOMP			
0272				37,2417	77616 0		FVC				

0276				37,2421	47020 0	FARTHR	ITA	RTB			
0277	REF	3	LAST	37,2421	00051 0			S2			
0278	REF	4	LAST	37,2422	21574 1			LCADTIME			
0279	REF	2	LAST	37,2423	02401 0		STORE	TEMPTIME			
0280				37,2424	51025 1		ESU	BFL			
0281	REF	3	LAST	37,2425	02433 1			TMARK			
0282	REF	1		37,2426	76431 0			FRTHR			
0283				37,2427	77624 1		CALL				
0284	REF	2	LAST	37,2430	76275 0			OVERFFIX			
0285				37,2431	74261 1	FARTHR	SL	VXSC			
0286				37,2432	20212 1			QC			
0287	REF	5	LAST	37,2433	02405 1			ERVECTOR			
0288				37,2434	53321 1		MXV	VAC			
0289	REF	8	LAST	37,2435	02642 1			XSM			
0290	REF	6	LAST	37,2436	02564 1			ERCOMP			
0291	REF	7	LAST	37,2437	16564 1		STCCL	ERCOMP			
0292	REF	3	LAST	37,2440	02421 0			TEMPTIME			
0293	REF	4	LAST	37,2441	02433 1		STORE	TMARK			
0294				37,2442	47170 1		AXT,1	RTP			
0295	REF	8	LAST	37,2443	02563 0		ECADR	ERCOMP			
0296	REF	1		37,2444	21706 0			PULSEIMU			
0297				37,2445	77650 1		GCTC				
0298	REF	4	LAST	37,2446	00051 0			S2			

02991				37,2447	00016 1	FARTHR*	EXTEND				
02992	REF	2	LAST	37,2450	23420 0		QXCH	QPLACES			
02993	REF	22	LAST	37,2451	00042 1		TC	INTERPRET			
02994				37,2452	77624 1		CALL				
02995	REF	1		37,2453	76420 0			EARTHR			
02996				37,2454	77776 1		EXIT				
02997	REF	2	LAST	37,2455	00215 1		TC	IMLSLLG			
02998	REF	3	LAST	37,2456	00142 0		TC	QPLACES			

03000				37,2457	00006 1	SFCW	EXTEND				
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L 1MU PERFORMANCE TESTS 2

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0301	REF	6	LAST	380	37,2460	23'417 1		QXCF	QPLACE	
0302	REF	6	LAST	377	37,2461	2 1416 0	SHOW1	CA	POSITION	
0303	REF	12	LAST	378	37,2462	55'051 0		TS	DSPTM2 +2	
0304	REF	1			37,2463	3 2472 1		CA	VBC6N58	
0305	REF	75	LAST	379	37,2464	7 4616 1		TC	BANKCALL	
0306	REF	5	LAST	374	37,2465	20477 1		CADR	GCFLASH	
0307	REF	2	LAST	374	37,2466	7 2270 0		TC	ENDTEST1	V 34
0308	REF	7	LAST	382	37,2467	0 1417 1		TC	GPLACC	V33
0309	REF	1			37,2470	1 2461 1		TCF	SHOW1	

0311					37,2471	07626 1	3550FEC	DFC	3990	
0312					37,2472	01542 0	VBC6N58	VN	0698	
0313					37,2473	01451 0	VN0641	VN	0641	
0315	REF	2	LAST	272	4361		DEC17	=	ND1	
0316					37,2474	00072 1	DFC58	DFC	58	
0317	REF	9	LAST	318	37,2475	02737 0	QGCPL	ECACR	CGC	
0318	REF	3	LAST	301	4777		1SECX	=	1SEC	
0319	REF	2	LAST	374	37,2476	01664 1	XNFACR	CENACR	XNB	
0320	REF	9	LAST	381	37,2477	01642 0	XSMACR	CENACR	XSM	
0322					4102			BLOCK	2	

0323	REF	1						COUNT*	\$4/P07	
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0324					4102	0 0004 0	FINETIME	INHINT		
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RETURNS WITH INTERRUPT INHIBITED

0325					4103	0 0006 1		EXTEND		
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0326	REF	1			4104	00 004 0		READ	LCSCALAR	
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0327	REF	40	LAST	380	4105	54 001 1		TS	L	
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0328					4106	7 0006 1		EXTEND		
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0329	REF	2	LAST	382	4107	06 004 0		RXC	LCSCALAR	
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0330					4110	7 0006 1		EXTEND		
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0331					4111	1 4115 1		BZF	+4	
------	--	--	--	--	------	----------	--	-----	----	--

0332					4112	0 0006 1		EXTEND		
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0333	REF	3	LAST	382	4113	00 004 0		READ	LCSCALAR	
------	-----	---	------	-----	------	----------	--	------	----------	--

0334	REF	41	LAST	382	4114	54 001 1		TS	L	
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0335	REF	5	LAST	378	4115	4 4733 0	+4	CS	PCSMAX	
------	-----	---	------	-----	------	----------	----	----	--------	--

0336	REF	42	LAST	382	4116	6 0001 0		AD	L	
------	-----	----	------	-----	------	----------	--	----	---	--

0337					4117	0 0006 1		EXTEND		
------	--	--	--	--	------	----------	--	--------	--	--

0338	REF	2	LAST	380	4120	1 4103 0		BZF	FINETIME +1	
------	-----	---	------	-----	------	----------	--	-----	-------------	--

0339					4121	0 0006 1		EXTEND		
------	--	--	--	--	------	----------	--	--------	--	--

0340	REF	1			4122	00 003 1		READ	HISCALAR	
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0341	REF	42	LAST	380	4123	0 0002 0		TC	Q	
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L IMU PERFORMANCE TESTS 4

USER'S PAGE NO. 1 FC 53

R0001 PROGRAM-IMU PERFORMANCE TESTS 4
R0002 DATE-NOV 15, 1966
R0003 BY- GEORGE SCHMIDT IL7-J46 FX1 1126
R0004 MCC NC-ZEPD

R0005 FUNCTIONAL DESCRIPTION

R0006 THIS SECTION CONSISTS OF THE FILTER FOR THE GYRO DRIFT TESTS. NO COMPASS
R0007 IS DONE IN LEM. FOR A DESCRIPTION OF THE FILTER SEE F-1573. THIS
R0008 SECTION IS ENTERED FROM IMU 2. IT RETURNS THERE AT END OF TEST.

R0009 ENTER 2,000 ZERO, ENTER PVSE

R0010 NORMAL EXIT

R0011 LENGTHEN GOES TO ZERO-RETURN TO IMU PERF TESTS 2 CONTROL

R0012 ALARMS

R0013 1600 OVERFLOW IN DRIFT TEST

R0014 1601 BAD IMU MODE IN ANY ROUTINE THAT USES IMU INSTALL
R0015 OUTPUT

R0016 FLASHING DISPLAY OF RESULTS-CONTROLLED IN IMU PERF TESTS 2

R0017 DEBRIS

R0018 ALL CENTRALS-ALL OF FRANK XSM

L IML PERFORMANCE TESTS 4

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0019				33,2045		BANK	33	
0020	REF	1		37,2000		SETLCC	IMU4	
0021				37,2500		BANK		
0022	REF	3	LAST	374 TC	382: 318 320*	COUNT*	\$1/P07	
0023	REF	10	LAST	382	E5,1642	EBANK=	XSM	
0024				37,2500	0 0004 0	ESTIMS	INHINT	
0025	REF	1		37,2501	31*572 0	CAE	1SECXT	
0026	REF	3	LAST	376	37,2502 0 5173 1	TC	TWIDDLE	
0027	REF	11	LAST	384	E5,1642	EBANK=	XSM	
0028	REF	1		37,2503	02536 0	ACRES	ALLOCP	
0029	REF	50	LAST	380	37,2514 3 4755 1	CAF	ZERO	ZERC THE PIPAS
0030	REF	6	LAST	380	37,2505 54 037 1	TS	PIPAZ	
0031	REF	1		37,2506	54 040 1	TS	PIPAY	
0032	REF	1		37,2507	54 041 0	TS	PIPAZ	
0033				37,2510	0 0003 1	RELINT		
0034	REF	1		37,2511	3 2075 0	CA	77DECM	
0035	REF	11	LAST	380	37,2512 55*571 1	TS	ZERONDX	
0036	REF	1		37,2513	3 3176 0	CA	ALXXXZ	
0037	REF	2	LAST	374	37,2514 0 2367 1	TC	ZERCING	
0038	REF	23	LAST	381	37,2515 0 6042 1	TC	INTPRET	
0039				37,2516	77735 0	SLOAD		
0040	REF	2	LAST	381	37,2517 37057 1		SCHZEROS	
0041	REF	10	LAST	337	37,2520 25477 1	STOVL	GCOMPSW -1	
0042	REF	1		37,2521	37070 1		INTVAL +2	
0043	REF	1		37,2522	26445 0	STOVL	ALXIS	
0044	REF	4	LAST	384	37,2523 37057 1		SCHZEROS	
0045	REF	6	LAST	330	37,2524 00325 0	STORE	DELX	
0046	REF	23	LAST	338	37,2525 01472 1	STORE	GCOMP	
00461				37,2526	77735 0	SLOAD		
00462	REF	5	LAST	378	37,2527 02441 1		TCRGNDX	
00463				37,2530	50076 0	DCOMP	BMN	
00464	REF	1		37,2531	76534 1		VEPTSKIP	
0047				37,2532	77624 1	CALL		
00471	REF	1		37,2533	76401 0		FRTHRVSE	
00472				37,2534	77776 1	VERTSKIP	EXIT	
0048	REF	1		37,2535	0 0035 1	TC	SLEEPIE +1	

L IMU PERFORMANCE TESTS 4

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00481	REF	2	LAST	374	37,2536	3 1576 1	ALLOCP	CA	CVFLOWCK	
004815					37,2537	0 0016 1		EXTEND		
00482					37,2540	1 2542 1		RZF	+2	
00483	REF	9	LAST	376	37,2541	0 5261 1		TC	TASKOVER	
0049	REF	1			37,2542	11 1530 1		CCS	ALTIM	
0050	REF	100	LAST	368	37,2543	3 0000 1		CA	A	SHOULD NEVER HIT THIS LOCATION
0051	REF	1			37,2544	55 1531 0		TS	ALTIMS	
0052	REF	101	LAST	385	37,2545	4 0100 0		CS	A	
0053	REF	2	LAST	385	37,2546	55 1530 1		TS	ALTIM	
00531	REF	21	LAST	376	37,2547	4 4753 0		CS	CAF	
00532	REF	1			37,2550	6 1562 1		AF	GELCOMPS	
00533					37,2551	0 0006 1		EXTEND		
00534					37,2552	1 2556 1		RZF	+4	
0054	REF	7	LAST	377	37,2553	2 1412 1		CA	LENGTHOT	
0055					37,2554	0 0006 1		EXTEND		
0056					37,2555	6 2562 1		RZMF	+5	
0057	REF	2	LAST	384	37,2556	31 1572 0		CAF	1SFCXT	
0058	REF	4	LAST	384	37,2557	0 5173 1		TC	TWIDDLE	
0059	REF	12	LAST	384	37,2558	02 5162 0		EBANK=	XSM	
0060	REF	2	LAST	384	37,2560	02 5136 0		ADRES	ALLOCP	
0061	REF	51	LAST	384	37,2561	3 4755 1		CAF	ZERO	
0062	REF	7	LAST	384	37,2562	56 137 0		XCH	PIPAK	
0063	REF	7	LAST	384	37,2563	54 324 0		TS	DELVX	
0064	REF	52	LAST	385	37,2564	3 4755 1		CAF	ZERO	
0065	REF	2	LAST	384	37,2565	56 140 0		XCH	PIPAY	
0066	REF	4	LAST	380	37,2566	54 326 1		TS	DELVY	
0067	REF	53	LAST	385	37,2567	3 4755 1		CAF	ZERO	
0068	REF	2	LAST	384	37,2570	56 141 1		XCH	PIFAZ	
0069	REF	3	LAST	331	37,2571	54 330 0		TS	DELVZ	
0070	REF	3	LAST	376	37,2572	3 4736 1	SPECSTS	CAF	PRIO20	
0071	REF	15	LAST	376	37,2573	0 5105 0		TC	FINDVAC	
0072	REF	13	LAST	385	37,2574	02 5177 0		EBANK=	XSM	
0073	REF	1			37,2575	76 165 0		2CACR	ALFLT	STAFF THE JCE
0074	REF	10	LAST	385	37,2576	0 5261 1		TC	TASKOVER	

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0075	REF	2	LAST	385	37,2577	11,562 0	ALFLT	CCS	GECCMPS
0076					37,2600	0 2602 1		TC	+2
00761	REF	1			37,2601	0 2604 1		TC	NORMLCP
0077	REF	76	LAST	382	37,2602	0 4616 1		TC	BANKCALL
0078	REF	1			37,2603	15271 1		CADR	1/PIPA
0079	REF	24	LAST	384	37,2604	0 6042 1	NORMLCP	TC	INTPET
0080					37,2605	77745 1		DLCAD	
0081	REF	2	LAST	384	37,2606	37066 0			INTVAL
0082	REF	5	LAST	363	37,2607	24051 0		STEVL	S1
00821	REF	8	LAST	385	37,2610	00325 0			DEL VX
00822					37,2611	76505 0		VXM	VSL1
008231	REF	14	LAST	385	37,2612	02643 1			XSM
008232					37,2613	57545 1		DLCAD	DCCMP
008233	REF	69	LAST	374	37,2614	00160 0			MFAC +3
008234	REF	1			37,2615	16523 1		STEEL	DPIPAY
008235	REF	70	LAST	386	37,2616	00162 1			MFAC +5
008236	REF	1			37,2617	02527 0		STORE	DPIPAZ

008237					37,2620	76001 1		SETFD	AXT,1
00824					37,2621	00001 0			0
00825					37,2622	00010 0			8D
00826					37,2623	57535 0		SLCAD	DCCMP
00827	REF	3	LAST	386	37,2624	02563 0			GECCMPS
00828					37,2625	77640 0		BMN	
00829	REF	1			37,2626	76772 1			PERFERAS
0083					37,2627	50135 0	ALCGKK	SLOAD	BMN
0084	REF	2	LAST	385	37,2630	02532 1			ALTIMS
0085	REF	1			37,2631	76644 0			ALFLT3
0086					37,2632	72174 0	ALKCG	AXT,2	LXA,1
0087					37,2633	00014 1			12D
0088	REF	2	LAST	384	37,2634	02444 1			ALX1S
0089					37,2635	62143 0	ALKCG2	DLCAE*	INCR,1
0090	REF	1			37,2636	02243 0			ALFDK +1440,1
0091					37,2637	77775 1		DEC	-2
0092	REF	1			37,2640	12545 0		STORE	ALDK +100,2
0093					37,2641	66104 1		TIIX,2	SXA,1
0094	REF	1			37,2642	76635 0			ALKCG2
0095	REF	3	LAST	386	37,2643	02444 1			ALX1S

LOADS SLOPES AND TIME CONSTANTS AT RGST

01074					37,2644	77770 1	ALFLT2	AXT,1	
01075					37,2645	00010 0			8D
0108					37,2646	41343 0	DELMPL	DLCAE*	DMP
0109	REF	2	LAST	386	37,2647	02533 0			DPIPAY +80,1
0110	REF	1			37,2650	37100 1			PIPA SC
0111					37,2651	43661 1		SLR	BDSU*
0112					37,2652	21212 0			9D
0113	REF	1			37,2653	02501 1			INTY +80,1
0114	REF	2	LAST	386	37,2654	06501 0		STORE	INTY +80,1
0115					37,2655	40725 0		FDCL	DMP*
0116	REF	1			37,2656	37102 0			VELSC

L 1MU PERFORMANCE TESTS 4

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0117	REF	1		37,2657	02521 0		VLAUN +8C,1
0118				37,2660	77732 1	SL2R	
0119				37,2661	45425 0	ESU	STADR
0120	REF	1		37,2662	71216 1	STORE	DELM +8C,1
0121	REF	2	LAST 387	37,2663	76663 1	STORE	DELM +10D,1
0122				37,2664	77100 0	TIIX,1	AXT,2
0123	REF	1		37,2665	76646 1		DELM LF
0124				37,2666	00004 0		4
0125				37,2667	56743 1	ALILP	CLCAD* DMF*
0126	REF	2	LAST 129	37,2670	75324 0		ALK +4,2
0127	REF	2	LAST 386	37,2671	75247 0		ALDK +4,2
0128	REF	2	LAST 387	37,2672	12453 0	STORE	ALK +4,2
0129				37,2673	77104 1	TIIX,2	AXT,2
0130	REF	1		37,2674	76667 1		ALILP
0131				37,2675	00010 0		8D
0132				37,2676	66140 1	ALKLP	LXC,1
0133	REF	1		37,2677	02445 0		CMFX1
0134	REF	2	LAST 387	37,2700	02445 0		CMFX1
0135				37,2701	55743 1	CLCAD*	DMPR*
0136	REF	4	LAST 387	37,2702	02450 1		ALK +1,1
0137	REF	3	LAST 387	37,2703	75216 0		DELM +8D,2
0138				37,2704	77613 0	DAC*	
0139	REF	2	LAST 386	37,2705	75276 0		INTY +8C,2
0140	REF	4	LAST 387	37,2706	12511 0	STORE	INTY +8D,2
0141				37,2707	42743 1	CLCAD*	DAD*
0142	REF	5	LAST 387	37,2710	75214 0		ALK +12C,2
0143	REF	3	LAST 387	37,2711	75230 1		ALDK +12D,2
0144	REF	6	LAST 387	37,2712	12463 0	STORE	ALK +12C,2
0145				37,2713	42673 0	DMPR*	DAD*
0146	REF	4	LAST 387	37,2714	75216 0		DELM +8D,2
0147	REF	5	LAST 387	37,2715	75266 1		INTY +16C,2
0148	REF	6	LAST 387	37,2716	12511 1	STORE	INTY +16D,2
0149				37,2717	42743 0	CLCAD*	DMF*
0150	REF	1		37,2720	37105 1		ALSK +1,1
0151	REF	5	LAST 387	37,2721	75216 0		DELM +8D,2
0152				37,2722	42772 0	SL1R	DAD*
0153	REF	2	LAST 387	37,2723	75256 1		VLAUN +8D,2
0154	REF	3	LAST 387	37,2724	12521 1	STORE	VLAUN +8D,2
0155				37,2725	76104 0	TIIX,2	AXI,1
0156	REF	1		37,2726	76676 1		ALKLP
0157				37,2727	00010 0		8C

0158				37,2730	64743 0	LOOSE	CLCAD* PCCL*
0159	REF	1		37,2731	02523 1		ACCWD +8D,1
0160	REF	4	LAST 387	37,2732	02521 0		VLAUN +8C,1
0161				37,2733	55523 0	PDDL*	VDEF
0162	REF	1		37,2734	02531 1		PCSNV +8D,1
0163				37,2735	76521 0	MXV	VSL1
0164	REF	2	LAST 118	37,2736	02101 1		TRANSM1

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0165				37,2737	77745 1	DLOAD	
0166	REF	71	LAST	386	37,2740	00155 0	MPAC
0167	REF	2	LAST	387	37,2741	06531 0	STORE PCSNV +80,1
0168					37,2742	77745 1	DLOAD
0169	REF	72	LAST	388	37,2743	00160 0	MPAC +3
0170	REF	5	LAST	387	37,2744	06521 1	STORE VLAUN +80,1
0171					37,2745	77745 1	DLOAD
0172	REF	73	LAST	388	37,2746	00162 1	MPAC +5
0173	REF	2	LAST	387	37,2747	06523 0	STORE ACCWC +80,1
0174					37,2750	77700 0	TIX,1
0175	REF	1			37,2751	76730 1	LCCSE
0176					37,2752	76174 1	AXT,2 AXT,1 EVALUATE SINES AND CCSINES
0177					37,2753	00006 1	6
0178					37,2754	00002 0	2
0179					37,2755	57343 1	BOOP
0180	REF	1			37,2756	02503 0	DLOAD* DMPR
0181	REF	1			37,2757	37110 0	ANGX +2,1
0182					37,2760	77722 0	GEORGEJ
0183					37,2761	73406 1	SR2R
0184					37,2762	56072 1	PUSH SIN
0185	REF	2	LAST	252	37,2763	00046 0	SL3R XAD,1
0186					37,2764	10021 0	X1
0187					37,2765	77745 1	STORE 160,2
0188					37,2766	77746 1	DLOAD
0189					37,2767	10027 0	COS
0190					37,2770	77704 1	STORE 220,2
0191	REF	1			37,2771	76755 1	TIX,2 CCSINES
0192					37,2772	77776 1	PERFERAS EXIT
0193	REF	1			37,2773	3 5016 0	CA EBANK7
0194	REF	11	LAST	337	37,2774	54 003 0	TS EBANK
0195	REF	1			37,1400		EBANK= ATIGINC
0196	REF	2	LAST	388	37,2775	0 1400 1	TC ATIGINC

GOTO ERASABLE TO CALCULATE ONLY TC RETN

R0197 CAUTION

R0198 THE ERASABLE PROGRAM THAT DOES THE CALCULATIONS MUST BE LOADED
 R0199 BEFORE ANY ATTEMPT IS MADE TO RUN THE IML PERFORMANCE TEST

01995	REF	5	LAST	375	37,1400		EBANK= AZIMUTH
0290	REF	8	LAST	385	37,2776	11'412 0	CCS LENGTHOT
0291	REF	2	LAST	384	37,2777	0 3034 0	TC SLEEP
0292	REF	6	LAST	384	37,2800	11'440 1	CCS TCRQNDX
0293					37,3001	1 3003 0	TCF +2
0294	REF	1			37,3002	0 3005 1	TC SETUPR1
0295	REF	9	LAST	378	37,3003	2 0032 0	CA CDUX
0296	REF	3	LAST	378	37,3004	55'414 0	TS LCSVEC +1

FOR TROUBLESHOOTING VD PCSNS 2#4

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0297	REF	25	LAST	386	37,3005	0 6042	1	SETUPERI	TC	INTPPET	
0298					37,3006	65345	0		ELCAC	PDDL	ANGLES FROM CRIFT TEST ONLY
0299	REF	1			37,3007	02473	0			ANGZ	
0300	REF	1			37,3010	02477	1			ANGY	
0301					37,3011	55525	0		PFCL	VDFE	
0302	REF	2	LAST	388	37,3012	02501	1			ANGX	
0303					37,3013	74275	1		VCOMP	VXSC	
0304	REF	2	LAST	388	37,3014	37111	0			GECPGEJ	
0305					37,3015	74521	1		MXV	VSE1	
0306	REF	15	LAST	386	37,3016	02643	1			XSM	
0307	REF	10	LAST	382	37,3017	02740	0		STCRE	CGC	
0308					37,3020	77776	1		EXIT		
0309	REF	1			37,3021	3 2475	0		CA	OGCPL	
0310	REF	77	LAST	386	37,3022	0 4616	1		TC	BANKCALL	
0311	REF	3	LAST	334	37,3023	17315	0		CADR	IMPULSE	
0312	REF	2	LAST	381	37,3024	0 2315	1		TC	IMLSLLG	
0313	REF	7	LAST	388	37,3025	11'440	1	GFSTRIT4	CCS	TORQNDX	ONLY POSITIVE IF IN VERTICAL CRIFT TEST
0314	REF	1			37,3026	0 2263	1		TC	VALMIS	
0315	REF	26	LAST	385	37,3027	0 6042	1		TC	TATPRET	
03151					37,3030	77624	1		CALL		
03152	REF	2	LAST	384	37,3031	76401	0			FRTHRUSE	
03153					37,3032	77776	1		EXIT		
0316	REF	1			37,3033	0 2117	1		TC	TCRQUE	
0317	REF	9	LAST	388	37,3034	55'412	0	SLEEP1E	TS	LENGTHCT	TEST NOT OVER-DECREMENT LENGTHOT
0318	REF	8	LAST	389	37,3035	11'440	1		CCS	TOPQNDX	ARE WE DOING VERTORIFT
0319	REF	4	LAST	377	37,3036	0 2447	1		TC	EASTER*	
0320	REF	36	LAST	377	37,3037	0 5155	0		TC	ENDOFJOB	
0321	REF	1			37,3040	3 5014	1	SCMEERRR	CA	ERANK5	
03211	REF	12	LAST	388	37,3041	54 003	0		TS	FEANK	
03212	REF	22	LAST	385	37,3042	3 4753	1		CA	ONE	
03213	REF	2	LAST	385	37,3043	55'576	0		TS	CWFLCWCK	STOP ALLCOP FROM CALLING ITSELF
03214	REF	20	LAST	364	37,3044	0 5567	0		TC	ALARM	
0322					37,3045	01601	0		OCT	1600	
0323	REF	3	LAST	382	37,3046	0 2270	0		TC	ENDTEST1	
0324	REF	1			37,3047	3 2054	0	SCMFRR2	CAF	OCT1601	
0325	REF	2	LAST	181	37,3050	0 5734	1		TC	VARALARM	
0330	REF	33	LAST	378	37,3051	0 5516	0		TC	CCWNFLAG	
0331	REF	4	LAST	378	37,3052	00007	0		ADRES	IMLSE	
0332	REF	37	LAST	389	37,3053	0 5155	0		TC	ENDOFJOB	
0333					37,3054	01601	1	OCT1601	OCT	01601	
0334					37,3055	06200	0	DFC585	OCT	06200	3200 8+14 CPCR IS IMPORTANT
0335					37,3056	00000	1	SCHZERCS	2DEC	00000000	
0335					37,3057	00000	1				

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0336		37,3060	00000 1		2DEC	.00000100	
0336		37,3061	00000 1				
0337		37,3062	00000 1		OCT	00000	
0338		37,3063	00000 1	CNEDPP	CCT	00000	ORDER IS IMPORTANT
0339		37,3064	00001 0		CCT	00001	
0340		37,3065	00004 0	INTVAL	CCT	4	
0341		37,3066	00002 0		CCT	2	
0342		37,3067	00220 1		DEC	144	
0343		37,3070	77776 1		DEC	-1	
0344		37,3071	35730 0	SCPLLY	2DEC	.93565870	INITIAL GAINS FOR PIP OUTPUTS
0344		37,3072	00035 1				
0345		37,3073	10317 0		2DEC	.26266423	INITIAL GAINS/4 FOR ERECTION ANGLES
0345		37,3074	17550 1				
0346		37,3075	00115 1	77DECML	DEC	77	
0347	REF 4 LAST 386	37,3076	01443 0	ALXXXZ	GENADR	ALX1S -1	
0348		37,3077	04133 1	PIPASC	2DEC	.13055869	
0348		37,3100	02265 1				
0349		37,3101	57223 0	VFLSC	2DEC	-.52223476	512/980.402
0349		37,3102	66451 1				
0350		37,3103	05427 0	ALSK	2DEC	.17329931	SSWAY VEL GAIN X 980.402/4096
0350		37,3104	12577 1				
0351		37,3105	77567 0		2DEC	-.00835370	SSWAY ACCEL GAIN X 980.402/4096
0351		37,3106	44202 1				
0352		37,3107	24276 1	GEORGEJ	2DEC	.63661977	
0352		37,3110	14066 1				
0353		37,3111	23073 1	GEORGEK	2DEC	.59737013	
0353		37,3112	11773 1				

L PINBALL GAME BUTTONS AND LIGHTS

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R0001 PROGRAM NAME - KEYBOARD AND DISPLAY PROGRAM
R0002 MOD NO - 4 DATE - 27 APRIL 1967 ASSEMBLY - FIDANCE REV 18
R0003 MOD BY - FILENE
R0004 LCC SECTION - PINBALL GAME BUTTONS AND LIGHTS

R0009 FUNCTIONAL DESCRIPTION-

R0010 THE KEYBOARD AND DISPLAY SYSTEM PROGRAM OPERATES UNDER EXECUTIVE
R0011 CONTROL AND PROCESSES INFORMATION EXCHANGED BETWEEN THE AGC AND THE
R0012 COMPUTER OPERATOR. THE INPUTS TO THE PROGRAM ARE FROM THE KEYBOARD,
R0013 FROM INTERNAL PROGRAMS, AND FROM THE UPLINK.
R0014 THE LANGUAGE OF COMMUNICATION WITH THE PROGRAM IS A PAIR OF WORDS
R0015 KNOWN AS VERB AND NOUN. EACH OF THESE IS REPRESENTED BY A 2 CHARACTER
R0016 DECIMAL NUMBER. THE VERB CODE INDICATES WHAT ACTION IS TO BE TAKEN, THE
R0017 NOUN CODE INDICATES TO WHAT THIS ACTION IS APPLIED. NOUNS USUALLY
R0018 REFER TO A GROUP OF ERASABLE REGISTERS.

R0020 VERBS ARE GROUPED INTO DISPLAYS, LOADS, MONITORS (DISPLAYS THAT ARE
R0021 UPDATED ONCE PER SECOND), SPECIAL FUNCTIONS, AND EXTENDED VERBS (THESE
R0022 ARE OUTSIDE OF THE DOMAIN OF PINBALL AND CAN BE FOUND UNDER LOG SECTION
R0023 :EXTENDED VERBS:).
R0024 A LIST OF VERBS AND NOUNS IS GIVEN IN LCC SECTION :ASSEMBLY AND
R0025 OPERATION INFORMATION:.

R0026 CALLING SEQUENCES-

R0027 KEYBOARD:
R0028 EACH DEPRESSION OF A KEYBOARD BUTTON ACTIVATES INTERRUPT KEYRUPTI
R0029 AND PLACES THE 5 BIT KEY CODE INTO CHANNEL 15. KEYRUPTI PLACES THE KEY
R0030 CODE INTO MPAC, ENTERS AN EXECUTIVE REQUEST FOR THE KEYBOARD AND DISPLAY
R0031 PROGRAM (AT :CHARIN:), AND EXECUTES A RESUME.

R0032 UPLINK:
R0033 EACH WORD RECEIVED BY THE UPLINK ACTIVATES INTERRUPT UPLRPT1 WHICH
R0034 PLACES THE 5 BIT KEY CODE INTO MPAC, ENTERS AN EXECUTIVE REQUEST FOR THE
R0035 KEYBOARD AND DISPLAY PROGRAM (AT:CHARIN:) AND EXECUTES A RESUME.

R0036 INTERNAL PROGRAMS:

R0037 INTERNAL PROGRAMS CALL PINBALL AT :NVSLB: WITH THE DESIRED VERB/NOUN
R0038 CODE IN A (LOW 7 BITS FOR NOUN, NEXT 7 BITS FOR VERB). DETAILS
R0039 DESCRIBED ON REMARKS CARDS JUST BEFORE :NVSUB: AND :NVSWAIT: (SEE
R0040 SYMECT TABLE FOR PAGE NUMBERS).

R0045 NORMAL EXIT MODES-

R0046 IF PINBALL WAS CALLED BY EXTERNAL ACTION, THERE ARE FOUR EXITS:
R004605 1) ALL BUT (2), (3), AND (4) EXIT DIRECTLY TO ENDCFJCR.
R00461 2) EXTENDED VERBS GO TO THE EXTENDED VERB PAN AS PART OF THE

L PINBALL GAME BUTTONS AND LIGHTS

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R004615 PINBALL EXECUTIVE JOB WITH PRIORITY 30000. IT IS THE
 R00462 RESPONSIBILITY OF THE EXTENDED VERB CALLED TO EVENTUALLY
 R00463 CHANGE PRIORITY (IF NECESSARY) AND DO AN ENDOFJOB.
 R004625 ALSO PINBALL IS A NOVAC JOB. BANK SET FOR COMMON.
 R00464 3) VERB 37. CHANGE OF PROGRAM (MAJOR MODE) CALLS :V37: IN THE
 R00465 SERVICE ROUTINES AS PART OF THE PINBALL EXEC JOB WITH PRI
 R00466 30000. THE NEW PROGRAM CODE (MAJOR MODE) IS LEFT IN A.
 R00467 4) KEY RELEASE BUTTON CALLS :PINBRNCH: IN THE DISPLAY INTERFACE
 R00468 ROUTINES AS PART OF THE PINBALL EXEC JOB WITH PRI 30000 IF
 R00469 THE KEY RELEASE LIGHT IS OFF AND :CAKRSTCR: IS NOT +0.

R0047 IF PINBALL WAS CALLED BY INTERNAL PROGRAMS, EXIT FROM PINBALL IS BACK
 R0048 TO CALLING ROUTINE. DETAILS DESCRIBED IN REMARKS CARDS JUST BEFORE
 R0049 :NVSUB: AND :NVSUBWAIT: (SEE SYMBOL TABLE FOR PAGE NUMBERS).

R0050 ALARM OR ABORT EXIT MODES-

R0051 EXTERNAL INITIATION:
 R0052 IF SOME IMPROPER SEQUENCE OF KEY CODES IS DETECTED, THE OPERATOR
 R0053 ERROR LIGHT IS TURNED ON AND EXIT IS TO :ENDOFJOB:.

R0054 INTERNAL PROGRAM INITIATION:
 R0055 IF AN ILLEGAL V/N COMBINATION IS ATTEMPTED, AN ABORT IS CAUSED
 R0056 (WITH OCTAL 01501).
 R00561 IF A SECOND ATTEMPT IS MADE TO GO TO SLEEP IN PINBALL, AN ABORT IS
 R00562 CAUSED (WITH OCTAL 01206). THERE ARE TWO WAYS TO GO TO SLEEP IN PINBALL:
 R00563 1) ENDDIE OR DATAWAIT.
 R00564 2) NVSUBWAIT, PRENVESY, OR NVSLBUSY.

R0057 CONDITIONS LEADING TO THE ABOVE ARE DESCRIBED IN FORTHCOMING MIT/IL
 R0058 E-REPORT DESCRIBING KEYBOARD AND DISPLAY OPERATION FOR 278.

R0059 OUTPUT-

R0060 INFORMATION TO BE SENT TO THE DISPLAY PANEL IS LEFT IN THE :DSPTAB:
 R0061 BUFFERS REGISTERS (UNDER EXEC CONTROL). :DSPCLT: (A PART OF 14RUPT)
 R0062 HANDLES THE PLACING OF THE :DSPTAB: INFORMATION INTO OUTPUT CHANNEL 13
 R0063 IN INTERRUPT.

R0064 ERASABLE INITIALIZATION-

R0065 FRESH START AND RESTART INITIALIZE THE NECESSARY R REGISTERS FOR
 R0066 PINBALL IN :STARTSUB:. REGISTERS ARE: DSPTAB BUFFER, CAKRSTCR,
 R0067 SECRET, CLPASS, DSPLCK, MONSAVE, MONSAVEI, VERBREG, NOUNREG, DSPLIST,
 R0068 DSFCCINT, NEUT.

R0069 A COMPLETE LIST OF ALL THE ERASABLES (BOTH RESERVED AND TEMPORARIES) FOR

L PINBALL GAME BUTTONS AND LIGHTS

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R0070 PINBALL IS GIVEN BELOW.

R0071 THE FOLLOWING ARE OF GENERAL INTEREST-

R0072 REMARKS CARDS PRECEDE THE REFERENCED SYMBOL DEFINITION. SEE SYMBOL
R0073 TABLE TO FIND APPROPRIATE PAGE NUMBERS.

R0074 NVSUB CALLING POINT FOR INTERNAL USE OF PINBALL.

R0075 OF RELATED INTEREST NVSEWAIT

R0076 NVSUBUSY

R0077 PRNVRSY

R0083 ENDJULF ROUTINE FOR INTERNAL PROGRAMS WISHING TO GO TO SLEEP WHILE
R0084 AWAITING OPERATORS RESPONSE.

R00851 DSPMM ROUTINE BY WHICH AN INTERNAL PROGRAM MAY DISPLAY A DECIMAL
R00852 PROGRAM CODE (MAJOR MODE) IN THE PROGRAM (MAJOR MODE) LIGHTS.
R008525 (DSPMM DOES NOT DISPLAY DIRECTLY BUT ENTERS EXEC REQUEST
R008527 FOR DSPMMJW WITH PRIC 34000 AND RETURNS TO CALLER.)

R00853 BLANKSUB ROUTINE BY WHICH AN INTERNAL PROGRAM MAY BLANK ANY
R00854 COMBINATION OF THE DISPLAY REGISTERS R1, R2, R3.

R00855 JAMTERM ROUTINES BY WHICH AN INTERNAL PROGRAM MAY PERFORM THE
R00856 JAMPROC TERMINATE (V 34) OR PROCEED (V 33) FUNCTION.

R0086 MONITOR VERBS FOR EFFICAC (1 PER SEC) DISPLAY.

R00861 PLEASE PERFORM, PLEASE MARK SITUATIONS

R00862 REMARKS DESCRIBING HOW AN INTERNAL ROUTINE SHOULD HANDLE
R00863 THESE SITUATIONS CAN BE FOUND JUST BEFORE :NVSUE: (SEE
R00864 SYMBOL TABLE FOR PAGE NUMBER).

R0087 THE ACUN TABLE FORMAT IS DESCRIBED ON A PAGE OF REMARKS CARDS JUST
R0088 BEFORE :DSPABC: (SEE SYMBOL TABLE FOR PAGE NUMBER).

R0089 THE ACUN TABLES THEMSELVES ARE FOUND IN LOG SECTION :PINBALL ACUN
R00891 TABLES:.

R0090 FOR FURTHER DETAILS ABOUT OPERATION OF THE KEYBOARD AND DISPLAY SYSTEM
R0091 PROGRAM, SEE THE MISSION PLAN AND/OR MIT/IL F-2129
R0092 DESCRIBING KEYBOARD AND DISPLAY OPERATION FOR 278.

R0150 THE FOLLOWING QUOTATION IS PROVIDED THROUGH THE COURTESY OF THE ALPHCRS.

R0151 :IT WILL BE PROVED TO TRY FACE THAT THOU FAST MEN ABOUT THEE THAT
R0152 USUALLY TALK OF A ACUN AND A VERR, AND SUCH ABMINABLE WORDS AS AC

L PINBALL GAME BUTTONS AND LIGHTS

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R0153 CHRISTIAN EAR CAN ENDURE TO HEAR.::

R0154 HENRY 6, ACT 2, SCENE 4

R0155 THE FOLLOWING ASSIGNMENTS FOR PINBALL ARE MADE ELSEWHERE

R0156 RESERVED FOR PINBALL EXECUTIVE ACTION

R0157	CSPCOUNT	ERASE		DISPLAY POSITION INDICATOR
R0158	DECBRACH	ERASE		+CFC, - CFC, OCT INDICATOR
R0159	VERBRFC	ERASE		VERB CODE
R0160	NCUNREG	ERASE		NCUN CODE
R0161	XREG	ERASE		P1 INPLT BUFFER
R0162	YREG	ERASE		R2 INPLT BUFFER
R0163	ZREG	ERASE		R3 INPUT BUFFER
R0164	XREGLP	ERASE		LC PART OF XREG (FCF DEC CCNV ONLY)
R0165	YREGLP	ERASE		LC PART OF YREG (FOR DEC CCNV ONLY)
R0166	HITEMCLT =		YREGLP	TEMP FOR DISPLAY OF HRS, MIN, SEC
R0167				MLST = LCTEMCLT-1.
R0168	ZREGLP	ERASE		LC PART OF ZREG (FOR DEC CCNV ONLY)
R0169	LCTEMCLT =		ZREGLP	TEMP FOR DISPLAY OF HRS, MIN, SEC
R0170				MLST = HITEMCLT+1.
R0171	MCDFRC	ERASE		MCDF CODE
R0172	CSFLOCK	ERASE		KEYCARD/SUBROUTINE CALL INTERLOCK
R0173	RCGRET	ERASE		RETURN REGISTER FOR LOAD
R0174	LOADSTAT	ERASE		STATUS INDICATOR FOR LOADTST
R0175	CLPASS	ERASE		PASS INDICATOR CLEAR
R0176	ACLT	ERASE		ACTIVITY COUNTER FOR DSPTAB
R0177	NCUNCADR	ERASE		MACHINE CADR FOR NCUN
R0178	MONSAVE	ERASE		N/V CODE FOR MONITOR. (= MONSAVE1-1)
R0179	MONSAVE1	ERASE		NCUNCADR FOR MONITOR(MATBS) =MONSAVE +1
R01795	MONSAVE2	ERASE		NVMONOPT OPTICS
R0180	CSFTAE	ERASE	+13D	7-10, DISPLAY PANEL BUFFER. 11-13, C RELAYS
R0181	CADRSTOR	ERASE		ENCICLE STORAGE
R0182	NVCTEM	ERASE		NVSUB STORAGE FOR CALLING ADDRESS
R0183				MLST = NVENKTEM-1
R0184	NVENKTEM	ERASE		NVSUB STORAGE FOR CALLING BANK
R0185				MLST = NVCTEM+1
R0186	VERBSAVE	ERASE		NEEDED FOR RECYCLE
R0187	CSPLIST	ERASE		WAITING REG FOR CSP SYST INTERNAL USE
R0188	EXTVBACT	ERASE		EXTENDED VERB ACTIVITY INTERLOCK
R0189	CSPTM1	ERASE	+2	BUFFER STORAGE AREA 1 (MOSTLY FOR TIME)
R0190	CSPTM2	ERASE	+2	BUFFER STORAGE AREA 2 (MOSTLY FOR DEC)
R0191	END OF FRASABLES RESERVED FOR PINBALL EXECUTIVE ACTION			

R0192 TEMPORARIES FOR PINBALL EXECUTIVE ACTION

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R0193	DSEXIT	=	INTR15+	RETURN FOR DSPIN
R0194	EXITEM	=	INTR15+	RETURN FOR SCALE FACTOR FOLTIME SELECT
R0195	BLANKRET	=	INTR15+	RETURN FOR 2RLANK
R0196	WRDRET	=	INTR15	RETURN FOR 5ELANK
R0197	WRRET	=	INTR15	RETURN FOR DSPW
R0198	DCPSET	=	INTR15	RETURN FOR PLTCOM(DEC LOAD)
R0199	21/22PFG	=	INTR15	TEMP FOR CHARIN
R0200	UPDATRET	=	PCLISH	RETURN FOR UPDATIN, LFCATVP
R0201	CHAR	=	PCLISH	TEMP FOR CHARIN
R0202	SPCNT	=	PCLISH	COUNTER FOR FRRCR LIGHT RESET
R0203	CFCCUNT	=	PCLISH	COUNTER FOR SCALING AND DISPLAY (DEC)
R0204	SGAON	=	VRUF	TEMP FOR +, - CN
R0205	NCLNTEM	=	VRUF	COUNTER FOR MIXNCLN FETCH
R0206	DISTEM	=	VRUF	COUNTER FOR DCTAL DISPLAY VERBS
R0207	DECTEM	=	VRUF	COUNTER FOR FETCH (DEC DISPLAY VERES)
R0208	SGAOFF	=	VRUF +1	TEMP FOR +, - CN
R0209	NVTEMP	=	VRUF +1	TEMP FOR NVSUB
R0210	SFTEMP1	=	VRUF +1	STORAGE FOR SF CONST HI PART(=SFTEMP2-1)
R0211	HITEMIN	=	VRUF +1	TEMP FOR LOAD OF FPS, MIN, SEC
R0212				MUST = LOTEMIN-1.
R0213	CODE	=	VRUF +2	FOR DSPIN
R0214	SFTEMP2	=	VRUF +2	STORAGE FOR SF CONST LC PART(=SFTEMP1+1)
R0215	LOTEMIN	=	VRUF +2	TEMP FOR LOAD OF FPS, MIN, SEC
R0216				MUST = HITEMIN+1.
R0217	MIXTEMP	=	VRUF +3	FOR MIXNCLN DATA
R0218	SIGNRET	=	VRUF +3	RETURN FOR +, - CN
R0219	ALSO MIXTEMP+1 = VRUF+4, MIXTEMP+2 = VRUF+5.			
R0220	ENTRET	=	DCTINC	EXIT FROM ENTER
R0221	WDONT	=	DCTRET	CHAR COUNTER FOR DSPW
R0222	INREL	=	DCTRET	INPUT BUFFER SELECTOR (X,Y,Z, REG)
R0223	DSPMMTEM	=	NATINC	DSPCOUNT SAVE FOR DSPMM
R0224	MIXPR	=	NATINC	INDICATOR FOR MIXED OR NORMAL NCLN
R0225	TEM1	FRASE		EXEC TEMP
R0226	DSPFL	=	TEM1	RFL ADDRESS FOR DSPIN
R0227	TEM2	FRASE		EXEC TEMP
R0228	DSMAG	=	TEM2	MAGNITUDE STORE FOR DSPIN
R0229	INDOCTEM	=	TEM2	MIXNCLN INDIRECT ADDRESS STORAGE
R0230	TEM3	ERASE		EXEC TEMP
R0231	COUNT	=	TEM3	FOR DSPIN

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```

R0232 TEM4 . ERASE EXEC TEMP
R0233 LSTPTR = TEM4 LIST PCINTER FOR GRABLSY
R0234 RELRET = TEM4 RETURN FOR RELDSP
R0235 PREFRET = TEM4 RETURN FOR PREFCSP
R0236 DSPWDRET = TEM4 RETURN FOR DSPSIGN
R0237 SEPSCRET = TEM4 RETURN FOR SEPSEC
R0238 SEPMMRET = TEM4 RETURN FOR SEPMIN

R0239 TEM5 ERASE EXEC TEMP
R0240 NCLNADD = TEM5 TEMP STORAGE FOR NOUN ADDRESS

R0241 NNADTEM ERASE TEMP FOR NOUN ADDRESS TABLE ENTRY
R0242 NNTYPEM ERASE TEMP FOR NOUN TYPE TABLE ENTRY
R0243 IDAD1TEM ERASE TEMP FOR INDIR ADDRESS TABLE ENTRY(MIXNN)
R0244 MUST = IDAD2TEM-1, = IDAD3TEM-2.
R0245 IDAD2TEM ERASE TEMP FOR INDIR ADDRESS TABLE ENTRY(MIXNN)
R0246 MUST = IDAD1TEM+1, = IDAD3TEM-1.
R0247 IDAD3TEM ERASE TEMP FOR INDIR ADDRESS TABLE ENTRY(MIXNN)
R0248 MUST = IDAD1TEM+2, = IDAD2TEM+1.
R0249 PUTMXTEM ERASE TEMP FOR SF PCUT TABLE ENTRY(MIXNN ONLY)
R0250 END OF TEMPORARIES FOR PINBALL EXECUTIVE ACTION

```

R02501 ADDITIONAL TEMPORARIES FOR PINBALL EXECUTIVE ACTION

```

R02502 MPAC, THRU MPAC +6
R02503 BUF, +1, +2
R02504 BUF2, +1, +2
R02506 MPTEMP
R02507 ADDRWD
R02509 END OF ADDITIONAL TEMPS FOR PINBALL EXEC ACTION

```

R0251 RESERVED FOR PINBALL INTERRUPT ACTION

```

R0252 DSPCNT ERASE COUNTER FOR DSPCNT
R0253 UPLOCK ERASE BIT1 = UPLINK INTERLOCK (ACTIVATED BY
A0254 RECEPTION OF A BAD MESSAGE IN UPLINK)
R0255 END OF EPASABLES RESERVED FOR PINBALL INTERRUPT ACTION

```

R0256 TEMPORARIES FOR PINBALL INTERRUPT ACTION

```

R0257 KEYTEMP1 = WAITEXIT TEMP FOR KEYRUPT, UPRUPT
R0258 DSPRPTM = WAITEXIT TEMP FOR DSPCLT
R0259 KEYTEMP2 = RUPTAGN TEMP FOR KEYRUPT, UPRUPT
R0260 END OF TEMPORARIES FOR PINBALL INTERRUPT ACTION

```

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R0261 THE INPUT CODES ASSUMED FOR THE KEYBOARD ARE,
 R0262 C 1000
 R0263 1 0001
 R0264 S 01001
 R0265 VERR 10001
 R0266 EPRCP RES10010
 R0267 KEY PLSE 11001
 R0268 + 11010
 R0269 - 11011
 R0270 ENTER 11100
 R0271 CLEAR 11110
 R0272 NCUN 11111

R0273 OUTPUT FORMAT FOR DISPLAY PANEL. SET OUTO TO AAAAPCCCCCDDDC.
 R0274 A-S SELECT A RELAYWORD. THIS DETERMINES WHICH PAIR OF CHARACTERS ARE
 R0275 ENERGIZED.
 R0276 R FOR SPECIAL RELAYS SUCH AS SIGNS ETC.
 R0277 C-S 5 BIT RELAY CODE FOR LEFT CHAR OF PAIR SELECTED BY RELAYWORD
 R0278 D-S 5 BIT RELAY CODE FOR RIGHTCHAR OF PAIR SELECTED BY RELAYWORD.

R0279 THE PANEL APPEARS AS FOLLOWS,
 R0280 MD1 MD2 (MAJOR MODE)
 R0281 VD1 VD2 (VERR) ND1 ND2 (NCUN)
 R0282 R1C1 R1C2 R1C3 R1C4 R1C5 (R1)
 R0283 R2C1 R2C2 R2C3 R2C4 R2C5 (R2)
 R0284 R3C1 R3C2 R3C3 R3C4 R3C5 (R3)

R0285 EACH OF THESE IS GIVEN A CSPOUNT NUMBER FOR USE WITHIN COMPUTATION ONLY
 R0286 MD1 25 R2C1 11 ALL ARE CCTL
 R0287 MD2 24 R2C2 10
 R0288 VD1 23 R2C3 7
 R0289 VD2 22 R2C4 6
 R0290 ND1 21 R2C5 5
 R0291 ND2 20 R3C1 4
 R0292 R1C1 16 R3C2 3
 R0293 R1C2 15 R3C3 2
 R0294 R1C3 14 R3C4 1
 R0295 R1C4 13 R3C5
 R0296 R1C5 12

R0297 THERE IS AN 11 REGISTER TABLE (DSPTAB) FOR THE DISPLAY PANEL.

R0298	DSPTAB RELAYWD	RIT11	BITS 10-6	BITS 5-1
R0299	RELADD			
R0300	1	1011	MD1 (25)	MD2 (24)
R0301	9	1010	VD1 (23)	VD2 (22)
R0302	8	1001	ND1 (21)	ND2 (20)
R0303	7	1000		R1C1 (16)

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R0304	6	.0111	+R1	R102 (15)	R103 (14)
R0305	5	0110	-R1	R104 (13)	R105 (12)
R0306	4	0101	+R2	R201 (11)	R202 (10)
R0307	3	0100	-R2	R203 (7)	R204 (6)
R0308	2	0011		R205 (5)	R301 (4)
R0309	1	0010	+R3	R302 (3)	R303 (2)
R0310	0	0001	-R3	R304 (1)	R305 (0)
R0311		0000			

NO PFLAYWORD

R0312 THE 5 BIT OUTPUT RELAY CODES ARE:

R0313	BLANK	00000
R0314	0	10101
R0315	1	00011
R0316	2	11001
R0317	3	11011
R0318	4	01111
R0319	5	11110
R0320	6	11100
R0321	7	10011
R0322	8	11101
R0323	9	11111

R03231 OUTPUT BITS USED BY PINBALL:

R03232	KEY RELEASE LIGHT	- BIT 5 OF CHANNEL 11
R03233	VERB/MCUN FLASH	- BIT 6 OF CHANNEL 11
R03234	OPERATOR ERROR LIGHT	- BIT 7 OF CHANNEL 11

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P0324 START OF EXECUTIVE SECTION OF PINBALL

0325 40,2177 BANK 40
 032501 REF 2 LAST 300 40,2000 SETLCC PINBALL1
 032502 40,2077 BANK

03258	REF	1						COUNT* \$1/PIN			
0330	REF	23	LAST	389	40,2177	3 4752	1	CHARIN	CAF	CAF	PLCCK DISPLAY SYST
0331	REF	2	LAST	223	40,2110	57 111	0		XCF	DSPLCCK	MAKE DSP SYST BUSY, RLT SAVE CLC
0332	REF	1			40,2111	54 115	0		TS	21/22 PFG	CICSPLOCK) FCP ERROR LIGHT RESET.
03321	REF	2	LAST	223	40,2112	11 041	1		CCS	CADRSTOR	ALL KEYS EXCEPT ER TURN ON KF LITE IF
03322					40,2103	0 2175	1		TC	+2	CADRSTOR IS FULL. THIS REMINDS OPERATOR
03323	REF	1			40,2114	1 2112	1		TC	CHAPIN2	TC RE-ESTABLISH A FLASHING DISPLAY
03324	REF	1			40,2105	4 2156	0		CS	ELFCODE1	WHICH HE HAS OBSERVED WITH DISPLAYS OF
03325	REF	74	LAST	388	40,2106	6 0154	1		AD	MPAC	HIS OWN (SEE REMARKS PRECEDING ROUTINE
03326					40,2107	0 0006	1		EXTEND		VBRELCSP).
03327	REF	2	LAST	399	40,2110	1 2112	0		BZF	CHARIN2	
03328	REF	1			40,2111	0 4374	0		TC	RELDSPCN	
0333	REF	75	LAST	399	40,2112	56 154	1	CHARIN2	XCH	MPAC	
0334	REF	1			40,2113	54 117	1		TS	CHAR	
0335	REF	112	LAST	385	40,2114	50 000	1		INDEX	^	
0336					40,2115	0 2116	0		TC	+1	INPLT CODE FUNCTION
0337	REF	1			40,2116	0 3471	1		TC	CHARALRM	0
0338	REF	1			40,2117	0 2175	0		TC	NUM	1
0339	REF	2	LAST	399	40,2120	0 2175	0		TC	NUM	2
0340	REF	3	LAST	399	40,2121	0 2175	0		TC	NUM	3
0341	REF	4	LAST	399	40,2122	0 2175	0		TC	NUM	4
0342	REF	5	LAST	399	40,2123	0 2175	0		TC	NUM	5
0343	REF	6	LAST	399	40,2124	0 2175	0		TC	NUM	6
0344	REF	7	LAST	399	40,2125	0 2175	0		TC	NUM	7
0345	REF	1			40,2126	0 2161	0		TC	89TEST	10
0346	REF	2	LAST	399	40,2127	0 2161	0		TC	89TEST	11
0347	REF	2	LAST	399	40,2130	0 3471	1		TC	CHARALRM	12
0348	REF	3	LAST	399	40,2131	0 3470	1		TC	CHARALRM	13
0349	REF	4	LAST	399	40,2132	0 3471	1		TC	CHARALRM	14
0350	REF	5	LAST	399	40,2133	0 3470	1		TC	CHARALRM	15
0351	REF	6	LAST	399	40,2134	0 3470	1		TC	CHARALRM	16
0352	REF	7	LAST	399	40,2135	0 3470	1		TC	CHARALRM	17
0353	REF	8	LAST	399	40,2136	0 2173	0		TC	NUM -2	20
0354	REF	1			40,2137	0 2354	1		TC	VERE	21
0355	REF	1			40,2140	0 3646	0		TC	ERROR	22
0356	REF	8	LAST	399	40,2141	0 3470	1		TC	CHARALRM	23
0357	REF	9	LAST	399	40,2142	0 3470	1		TC	CHARALRM	24
0358	REF	10	LAST	399	40,2143	0 3471	1		TC	CHARALRM	25
0359	REF	11	LAST	399	40,2144	0 3470	1		TC	CHARALRM	26
0360	REF	12	LAST	399	40,2145	0 3470	1		TC	CHARALRM	27
0361	REF	13	LAST	399	40,2146	0 3471	1		TC	CHARALRM	28
0362	REF	1			40,2147	0 3524	1		TC	VBRELCSP	31
0363	REF	1			40,2150	0 2417	0		TC	PCSGN	32

KEY RELEASE

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0364	REF	1		40,2151	0 2374 0	TC	NECSSN	33	-
0365	REF	1		40,2152	0 2157 0	TC	ENTERJMP	34	ENTER
0366	REF	14	LAST 399	40,2153	0 3470 1	TC	CHARALRM	35	
0367	REF	1		40,2154	0 2467 0	TC	CLEAR	36	CLEAR
0368	REF	1		40,2155	0 2370 1	TC	NCUN	37	NCUN
03685				40,2156	00022 1	ELRCODE1	OCT	22	
0369	REF	17	LAST 300	40,2157	0 4635 0	ENTERJMP	TC	POSTJUMP	
0370	REF	1		40,2160	62002 1	CACR	ENTER		
0371	REF	3	LAST 223	40,2161	10 776 0	ESTEST	CCS	DSPCCUNT	
0372				40,2162	0 2166 1	TC	+4	+	
0373				40,2163	0 2166 1	TC	+3	+0	
0374	REF	38	LAST 389	40,2164	0 5155 0	TC	ENDCFJCB	-	BLOCK DATA IN IF DSPCCUNT IS - CR -0
0375	REF	39	LAST 400	40,2165	0 5155 0	TC	ENDCFJCB	-0	
0376	REF	4	LAST 340	40,2166	3 6250 0	CAF	THREE		
0377	REF	1		40,2167	7 0777 1	MASK	DECBRNCH		
0378	REF	103	LAST 399	40,2170	10 000 0	CCS	A		
0379	REF	9	LAST 399	40,2171	0 2175 0	TC	NUM		IF DECBRNCH IS +, 8 OR 9 OK
0380	REF	15	LAST 400	40,2172	0 3470 1	TC	CHARALRM		IF DECBRNCH IS +0, REJECT 8 CR 9

R0381 NUM ASSEMBLES OCTAL 3 BITS AT A TIME. FOR DECIMAL IT CONVERTS INCOMING
 R0382 WORD AS A FRACTION, KEEPING RESULTS TO EP.
 R0383 OCTAL RESULTS ARE LEFT IN XREG, YREG, OR ZREG. +I PART OF DEC IN XREG,
 R0384 YREG, ZREG. THE LOW PARTS IN XREGLP, YREGLP, OR ZREGLP)
 R0385 DECBRNCH IS LEFT AT +0 FOR OCT, +1 FOR + DEC, +2 FOR - DEC.
 R0386 IF DSPCCUNT WAS LEFT -, NO MORE DATA IS ACCEPTED.

0387	REF	54	LAST 385	40,2173	3 4755 1	CAF	ZERO		
0388	REF	2	LAST 399	40,2174	54 117 1	TS	CHAR		
0389	REF	4	LAST 400	40,2175	10 776 0	NLM	CCS	DSPCCUNT	
0390				40,2176	0 2202 0	TC	+4	+	
0391				40,2177	0 2202 0	TC	+3	+0	
0392				40,2200	0 2201 0	TC	+1	-	BLOCK DATA IN IF DSPCCUNT IS -
0393	REF	40	LAST 400	40,2201	0 5155 0	TC	ENDCFJCB	-0	
0394	REF	1		40,2202	0 2324 0	TC	GETINREL		
0395	REF	2	LAST 223	40,2203	11 014 1	CCS	CLPASS		IF CLPASS IS + CR +0, MAKE IT +0.
0396	REF	55	LAST 400	40,2204	3 4755 1	CAF	ZERO		
0397	REF	3	LAST 400	40,2205	55 014 1	TS	CLPASS		
0398				40,2206	0 2207 0	TC	+1		
0399	REF	3	LAST 400	40,2207	50 117 0	INDEX	CHAR		
0400	REF	2	LAST 158	40,2210	3 4066 0	CAF	RELTAB		
0401	REF	1		40,2211	7 4346 0	MASK	LCW5		
0402	REF	1		40,2212	54 124 1	TS	CCDE		
0403	REF	5	LAST 400	40,2213	3 0776 1	CA	DSPCCUNT		
0404	REF	1		40,2214	54 143 0	TS	CCUNT		
0405	REF	1		40,2215	0 2356 1	TC	DSPIN		
0406	REF	5	LAST 400	40,2216	3 6250 0	CAF	THREE		

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0407	REF	2	LAST	400	40,2217	7 0777 1	MASK	DECBRNCH	
0408	REF	174	LAST	400	40,2220	10 010 0	CCS	A	+0, OCTAL. +1, + DEC. +2, - DEC.
0409	REF	1			40,2221	0 2232 0	TC	DECTOBIN	+
0410	REF	1			40,2222	50 137 1	INDEX	INREL	+0 OCTAL
0411	REF	2	LAST	223	40,2223	57 000 0	XCF	VERBREG	
0412	REF	1			40,2224	54 022 0	TS	CYL	
0413	REF	2	LAST	401	40,2225	4 022 0	CS	CYL	
0414	REF	3	LAST	401	40,2226	4 022 0	CS	CYL	
0415	REF	4	LAST	401	40,2227	56 022 1	XCF	CYL	
0416	REF	4	LAST	400	40,2230	6 0117 0	AD	CHAR	
0417	REF	1			40,2231	0 2247 1	TC	ENCNMTST	
0418	REF	2	LAST	401	40,2232	50 137 1	DECTOBIN	INDEX	INREL
0419	REF	3	LAST	401	40,2233	57 000 0	XCF	VERBREG	
0420	REF	76	LAST	399	40,2234	54 154 0	TS	MPAC	SUM X 2EXP-14 IN MPAC
0421	REF	56	LAST	400	40,2235	3 4755 1	CAF	ZERO	
0422	REF	77	LAST	401	40,2236	54 155 1	TS	MPAC	+1
0423	REF	4	LAST	222	40,2237	3 4363 0	CAF	TEN	10 X 2EXP-14
0424	REF	1			40,2240	0 7312 0	TC	SHORTMP	10SUM X 2EXP-28 IN MPAC, MPAC+1
0425	REF	78	LAST	401	40,2241	56 155 0	XCF	MPAC	+1
0426	REF	5	LAST	401	40,2242	6 0117 0	AD	CHAR	
0427	REF	79	LAST	401	40,2243	54 155 1	TS	MPAC	+1
0428	REF	2	LAST	401	40,2244	0 2247 1	TC	ENCNMTST	NO CF
0429	REF	90	LAST	401	40,2245	26 154 0	ADS	MPAC	OF MUST BE 5TH CHAR
0430	REF	1			40,2246	0 2265 1	TC	CFEND	
0431	REF	3	LAST	401	40,2247	50 137 1	ENCNMTST	INDEX	INREL
0432	REF	4	LAST	401	40,2250	55 000 1	TS	VERBREG	
0433	REF	6	LAST	400	40,2251	4 0776 0	CS	DSPCCUNT	
0434	REF	4	LAST	401	40,2252	50 137 1	INDEX	INREL	
0435	REF	1			40,2253	6 2315 1	AD	CRITCON	
0436					40,2254	0 0026 1	EXTEND		
0437	REF	1			40,2255	1 2257 1	BZF	ENDNUM	-0, DSPCCUNT = CRITCON
0438	REF	1			40,2256	0 2312 0	TC	MCENUM	- , DSPCCUNT G/ CRITCON
0439	REF	6	LAST	400	40,2257	3 6250 0	ENDNUM	CAF	THREE
0440	REF	3	LAST	401	40,2260	7 1777 1	MASK	DECBRNCH	
0441	REF	105	LAST	401	40,2261	10 010 0	CCS	A	
0442	REF	2	LAST	401	40,2262	0 2265 1	TC	DECFEND	
0443	REF	7	LAST	401	40,2263	4 0776 0	ENDCALL	CS	DSPCCUNT
0444	REF	2	LAST	401	40,2264	0 2313 1	TC	MCENUM	+1
0445	REF	24	LAST	399	40,2265	4 4753 0	DECFEND	CS	CNE
0446	REF	5	LAST	401	40,2266	6 0137 1	AD	INREL	
0447					40,2267	0 0076 1	EXTEND		
0448	REF	1			40,2270	6 2263 1	BZMF	ENDCALL	IF INREL=0,1(VBREG,ANREG), LEAVE WHILE
0449	REF	1			40,2271	0 7106 1	TC	DMP	IF INREL=2,3,4(R1,R2,R3), CONVERT TO FRAC
0450									MLT SUM X 2EXP-28 IN MPAC, MPAC+1 FY
0451	REF	1			40,2272	0 2322 0	ACRES	DECON	2EXP14/10EXP5. GIVES(SUM/10EXP5)X2EXP-14
0452	REF	7	LAST	401	40,2273	3 6250 0	CAF	THREE	IN MPAC, +1, +2.
0453	REF	4	LAST	401	40,2274	7 0777 1	MASK	DECBRNCH	
0454	REF	106	LAST	401	40,2275	50 000 1	INDEX	A	
0455					40,2276	0 2276 0	TC	+0	
0456	REF	1			40,2277	0 2312 0	TC	+DECON	

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0457					40,2300	0 0006 1	EXTEND		- CASE
0458	REF	81	LAST	401	40,2301	4 0156 1	CCS	MPAC	+1
0459	REF	82	LAST	402	40,2302	52 156 1	EXCH	MPAC	+1
0460	REF	83	LAST	402	40,2303	56 156 0	+DECCEN	XCH	MPAC +2
0461	REF	6	LAST	401	40,2304	50 137 1	INDEX	INREL	
0462	REF	1			40,2305	55 000 1	TS	XREGLE	-2
0463	REF	84	LAST	402	40,2306	56 156 0	XCH	MPAC	+1
0464	REF	7	LAST	402	40,2307	50 137 1	INDEX	INREL	
0465	REF	5	LAST	401	40,2308	55 000 1	TS	VERBREG	
0466	REF	2	LAST	401	40,2311	0 2263 1	TC	ENDALL	
0467	REF	8	LAST	401	40,2312	10 776 0	MCRNLM	CCS	DSPCCUNT
0468	REF	9	LAST	402	40,2313	54 776 0	TS	DSPCCUNT	DECREMENT DSPCCUNT
0469	REF	41	LAST	402	40,2314	0 5155 0	TC	ENDOFJCH	
0470					40,2315	00022 1	CRITCCN	CCT	22
0471					40,2316	00020 0		CCT	20
0472					40,2317	00012 1		CCT	12
0473					40,2320	00005 1		CCT	5
0474					40,2321	00000 1		CCT	0
0475					40,2322	05174 0	DECCN	2DEC	F-5 R14
0475					40,2323	13261 0			2EXP14/10EXP5 = .16384 DEC

R0476 GETINREL GETS PROPER DATA REG REL ADDRESS FOR CURRENT C(DSPCCUNT) AND
R0477 PUTS IN INTO INREL. +0 VERBREG, 1 NOUNREG, 2 XREG, 3 YREG, 4 ZREG.

0478	REF	10	LAST	402	40,2324	50 776 1	GETINREL	INDEX	DSPCCUNT
0479	REF	1			40,2325	3 2330 0	CAF	INRELTAB	
0480	REF	8	LAST	402	40,2326	54 137 0	TS	INREL	(A TEMP, REG)
0481	REF	43	LAST	382	40,2327	0 0002 0	TC	0	
0482					40,2330	00004 0	INRELTAB	CCT	4
0483					40,2331	00004 0		CCT	4
0484					40,2332	00004 0		CCT	4
0485					40,2333	00004 0		CCT	4
0486					40,2334	00004 0		CCT	4
0487					40,2335	00003 1		CCT	3
0488					40,2336	00003 1		CCT	3
0489					40,2337	00003 1		CCT	3
0490					40,2340	00003 1		CCT	3
0491					40,2341	00003 1		CCT	3
0492					40,2342	00002 0		CCT	2
0493					40,2343	00002 0		CCT	2
0494					40,2344	00002 0		CCT	2
0495					40,2345	00002 0		CCT	2
0496					40,2346	00002 0		CCT	2
0497	REF	2	LAST	377	40,2347	0 5675 0	TC	CCSHOLE	NO DSPCCUNT NUMBER = 150
0498					40,2350	00001 0		CCT	1
0499					40,2351	00001 0		CCT	1

R305 (DSPCCUNT = 0)

R304 = (1)

R303 = (2)

R302 = (3)

R301 = (4)

R205 = (5)

R204 = (6)

R203 = (7)

R202 = (8D)

R201 = (9C)

R105 = (100)

R104 = (110)

R103 = (120)

R102 = (130)

R101 = (14C)

R02 = (16C)

R01 = (17C)

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0500				40,2352	00000	1		CCT		VD2	=(180)
0501				40,2353	00000	1		CCT		VD1	=(190)
0502	REF	57	LAST	401	40,2354	3 4755	1	VERB	CAF	ZERO	
0503	REF	6	LAST	402	40,2355	55'000	1		TS	VERBRFG	
0504	REF	2	LAST	223	40,2356	3 4360	0		CAF	VD1	
0505	REF	11	LAST	402	40,2357	54 776	0	AVCCM	TS	DSPCCUNT	
0506	REF	1			40,2360	0 2641	1		TC	2BLANK	
0507	REF	25	LAST	401	40,2361	3 4752	1		CAF	ONE	
0508	REF	5	LAST	401	40,2362	54 777	1		TS	DECBRNCH	SET FOR DEC V/N CODE
0509	REF	58	LAST	403	40,2363	3 4755	1		CAF	ZERO	
0510	REF	2	LAST	223	40,2364	55'012	1		TS	REQRET	SET FOR ENTPASC
0511	REF	1			40,2365	3 4217	1		CAF	ENTINST	IF DSPALARM OCCURS BEFORE FIRST ENTPASC
0512	REF	1			40,2366	54 136	1		TS	ENTRET	OR AVSUB, ENTRET MUST ALREADY BE SET
0513											TO TC ENDOFJOB
0514	REF	42	LAST	402	40,2367	0 5155	0		TC	ENDOFJOB	
0515	REF	59	LAST	403	40,2370	3 4755	1	NCUN	CAF	ZERO	
0516	REF	7	LAST	305	40,2371	55'111	0		TS	NCUNRFG	
0517	REF	3	LAST	382	40,2372	3 4361	1		CAF	ND1	ND1, CCT 21 (DEC 17)
0518	REF	1			40,2373	0 2357	1		TC	NVCQM	
0519	REF	1			40,2374	0 2446	0	NEGSGN	TC	SIGNTST	
0520	REF	1			40,2375	0 2433	1		TC	-ON	
0521	REF	17	LAST	376	40,2376	3 4752	0		CAF	TWC	
0522	REF	9	LAST	402	40,2377	50 137	1	BOTHSGN	INDEX	INREL	SET DEC CCMP BIT TO 1 (IN DECBRNCH)
0523	REF	17	LAST	192	40,2400	6 4745	0		AD	RIT7	BIT 5 FOR R1, BIT 4 FOR R2,
0524	REF	6	LAST	403	40,2401	26 777	1		AES	DECBRNCH	BIT 3 FOR R3.
0525	REF	4	LAST	400	40,2402	11'014	1	FIXCLPAS	CCS	CLPASS	IF CLPASS IS + OR +0, MAKE IT +0.
0526	REF	60	LAST	403	40,2403	3 4755	1		CAF	ZERO	
0527	REF	5	LAST	403	40,2404	55'014	1		TS	CLPASS	
0528					40,2405	0 2406	1		TC	+1	
0529	REF	43	LAST	402	40,2406	0 5155	0		TC	ENDOFJOB	
0530	REF	2	LAST	403	40,2407	0 2446	0	PCSGN	TC	SIGNTST	
0531	REF	1			40,2410	0 2413	0		TC	+ON	
0532	REF	26	LAST	403	40,2411	3 4752	1		CAF	CAE	
0533	REF	1			40,2412	0 2377	0		TC	BOTHSGN	
0534	REF	44	LAST	402	40,2413	22 002	0	+CN	LXCH	0	
0535	REF	2	LAST	400	40,2414	0 2324	0		TC	GETINREL	
0536	REF	10	LAST	403	40,2415	50 137	1		INDEX	INREL	
0537	REF	1			40,2416	3 2441	1		CAF	SGNTAB -2	
0538	REF	1			40,2417	54 123	0		TS	SGNOFF	
0539	REF	27	LAST	403	40,2420	6 4753	1		AD	ONE	
0540	REF	1			40,2421	54 122	1		TS	SGACN	
0541	REF	61	LAST	403	40,2422	3 4755	1	SGNCCM	CAF	ZERO	
0542	REF	2	LAST	400	40,2423	54 124	1		TS	CCRE	
0543	REF	2	LAST	403	40,2424	56 123	1		XCH	SGNCCF	

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0544	REF	1		40,2425	0 3440	1	TC	11DSFIN
0545	REF	18	LAST	373	40,2426	3 4741	1	CAF
0546	REF	3	LAST	403	40,2427	54 124	1	TS
0547	REF	2	LAST	403	40,2430	56 122	0	XCF
0548	REF	2	LAST	404	40,2431	0 3440	1	TC
0549	REF	43	LAST	382	40,2432	0 0001	0	TC
0550	REF	45	LAST	403	40,2432	22 002	0	-CN LXCF
0551	REF	3	LAST	403	40,2434	0 2324	0	TC
0552	REF	11	LAST	403	40,2435	50 137	1	INDEX
0553	REF	2	LAST	403	40,2436	3 2441	1	CAF
0554	REF	3	LAST	404	40,2437	54 122	1	TS
0555	REF	28	LAST	403	40,2440	6 4753	1	AD
0556	REF	3	LAST	403	40,2441	54 123	0	TS
0557	REF	1			40,2442	1 2422	1	TC

0558				40,2443	00005	1	SGATAB	CCT	5	-R1
0559				40,2444	00003	1		CCT	3	-R2
0560				40,2445	00000	1		CCT	0	-R3

0561	REF	46	LAST	404	40,2446	22 002	0	SIGNTST	LXCH	C	ALLCWS +, - ONLY WHEN DSPCCUNT=R2D1,
0562	REF	8	LAST	401	40,2447	3 6250	0	CAF	THREE		R2D1, OR R3D1. ALLCWS ONLY FIRST CF
0563	REF	7	LAST	403	40,2450	7 0777	1	MASK	DECBRNCH		CONSECUTIVE +/- CHARACTERS.
0564	REF	107	LAST	401	40,2451	10 000	0	CCS	A		IF LCW2 BITS CF DECBRNCH NOT= 0, SIGN
0565	REF	44	LAST	403	40,2452	0 5155	0	TC	ENDCFJCB		FOR THIS WORD ALREADY IN. REJECT.
0566	REF	1			40,2453	4 4317	1	CS	R1C1		
0567	REF	1			40,2454	0 2462	0	TC	SGTST1		
0568	REF	1			40,2455	4 4320	0	CS	R2C1		
0569	REF	2	LAST	404	40,2456	0 2462	0	TC	SGTST1		
0570	REF	1			40,2457	4 4321	1	CS	R3D1		
0571	REF	3	LAST	404	40,2460	0 2462	0	TC	SGTST1		
0572	REF	45	LAST	404	40,2461	0 5155	0	TC	ENDCFJCB		NO MATCH FOUND. SIGN ILLEGAL
0573	REF	12	LAST	403	40,2462	6 0776	1	SGTST1	AD	DSPCCOUNT	
0574					40,2463	0 0006	1	EXTEND			
0575					40,2464	1 2466	0	BZF	+2		MATCH FOUND
0576	REF	47	LAST	404	40,2465	0 0002	0	TC	C		
0577	REF	44	LAST	404	40,2466	0 0001	0	TC	L		SIGN LEGAL

R0578 CLEAR BLANKS WHICH R1, R2, R3 IS CURRENT OR LAST TO BE DISPLAYED (PERTINE
 R0579 NT XREG, YREG, ZREG IS CLEARED). SUCCESSIVE CLEARS TAKE CARE OF EACH RX
 R0580 L/ RC UNTIL R1 IS DONE. THEN NO FURTHER ACTION

R0581 THE SINGLE COMPONENT LOAD VERES ALLOW ONLY THE SINGLE RC THAT IS
 R0582 APPROPRIATE TO BE CLEARED.

R0583 CLFAS +J PASSO, CAN BE BACKED UP
 R0584 +NZ HIRAS, CAN BE BACKED UP
 R0585 -NZ PASSO, CANNOT BE BACKED UP

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0586	REF	13	LAST	404	40,2467	10 776 0	CLEAR	CCS	DSPCCNT	
0587	REF	29	LAST	404	40,2470	6 4753 1		AD	ONE	
0588					40,2471	0 2473 1		TC	+2	
0589	REF	30	LAST	405	40,2472	6 4753 1		AD	CNE	
0590	REF	108	LAST	404	40,2473	50 000 1		INDEX	A	DO NOT CHANGE DSPCCNT BECAUSE MAY LATER
0591	REF	2	LAST	402	40,2474	3 2330 0		CAF	INRELTAB	FAIL LEGALIST.
0592	REF	12	LAST	404	40,2475	54 137 0		TS	INREL	MUST SET INREL, EVEN FOR FIPASS.
0593	REF	6	LAST	403	40,2476	11 014 1		CCS	CLPASS	
0594	REF	1			40,2477	0 2505 0		TC	CLPASHI	+
0595					40,2500	0 2512 1		TC	+2	+0 IF CLPASS IS +0 OR -, IT IS PASSO
0596					40,2501	0 2512 1		TC	+1	-
0597	REF	13	LAST	405	40,2502	3 0137 1		CA	INREL	
0598	REF	1			40,2503	7 2527 0		TC	LEGALIST	
0599	REF	1			40,2504	0 2522 0		TC	CLEAR1	
0600	REF	14	LAST	405	40,2505	10 137 0	CLEAR1	CCS	INREL	
0601	REF	15	LAST	405	40,2506	54 137 0		TS	INREL	
0602	REF	2	LAST	405	40,2507	0 2527 0		TC	LEGALIST	
0603	REF	1			40,2510	3 2577 0		CAF	DCLBLK +2	+3 TO - NUMBER. BACKS DATA REQUESTS.
0604	REF	3	LAST	403	40,2511	27 012 1		ACS	PEORET	
0605	REF	16	LAST	405	40,2512	3 0137 1		CA	INREL	
0606	REF	1			40,2513	54 125 0		TS	MIXTEMP	TEMP STORAGE FOR INREL
0607					40,2514	0 0006 1		EXTEND		
0608	REF	7	LAST	403	40,2515	27 000 1		DIM	VERBREG	INCREMENT VERB AND RE-DISPLAY
0609	REF	78	LAST	389	40,2516	0 4616 1		TC	BANKCALL	
0610	REF	1			40,2517	62342 0		CADR	UFFATVP	
0611	REF	2	LAST	405	40,2520	3 0125 1		CA	MIXTEMP	
0612	REF	17	LAST	405	40,2521	54 137 0		TS	INREL	RESTORE INREL
0613	REF	1			40,2522	0 2525 1	CLEAR1	TC	CLRS	
0614	REF	7	LAST	405	40,2523	25 014 0		INCR	CLPASS	ONLY IF CLPASS IS + OR +0,
0615	REF	46	LAST	404	40,2524	0 5155 0		TC	ENDCFJOB	SET FOR HIGHER PASS.
0616	REF	48	LAST	404	40,2525	22 002 0	CLRS	LXCH	Q	USES 5BLANK PUT AVOIDS ITS TC CFTINREL
0617	REF	1			40,2526	1 2540 1		TC	5BLANK +2	
0618	REF	2	LAST	231	40,2527	6 7751 0	LEGALIST	AD	NEG2	
0619	REF	109	LAST	405	40,2530	10 000 0		CCS	A	
0620	REF	49	LAST	405	40,2531	0 0012 0		TC	Q	LEGAL INREL G/ 2
0621	REF	3	LAST	402	40,2532	0 5675 0		TC	CCSHCLE	
0622	REF	47	LAST	405	40,2533	0 5155 0		TC	ENDCFJOB	ILLEGAL INREL = 0,1
0623	REF	50	LAST	405	40,2534	0 0022 0		TC	Q	LEGAL INREL = 2

R0624 5BLANK BLANKS 5 CHAR DISPLAY WORD IN R1, R2, OR R3. IT ALSO ZEROES XREG,
 R0625 YREG, OR ZREG. PLACE ANY + DSPCCNT NUMBER FOR PERTINENT PC INTO DSPCCNT
 R0626 DSPCCNT IS LEFT SET TO LEFT MOST DSP ALMP FOR PC JUST BLANKED.

0627	REF	14	LAST	405	40,2535	54 776 0		TS	DSPCCNT	NEEDED FOR BLANKSUB
0628	REF	51	LAST	405	40,2536	22 002 0	5BLANK	LXCH	Q	
0629	REF	4	LAST	404	40,2537	7 2324 0		TC	GETINREL	
0630	REF	62	LAST	403	40,2540	3 4755 1		CAF	ZERO	
0631	REF	18	LAST	405	40,2541	50 137 1		INDEX	INREL	
0632	REF	8	LAST	405	40,2542	55 000 1		TS	VERBREG	ZERO X, Y, Z REG.

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0633	REF	19	LAST	405	40,2543	50 137 1	INDEX	INPFL	
0634	REF	2	LAST	402	40,2544	55 103 1	TS	XRFGLF -2	
0635	REF	4	LAST	404	40,2545	54 124 1	TS	CODE	
0636	REF	20	LAST	406	40,2546	50 137 1	INDEX	INPFL	ZERC PERTINENT DEC COMP BIT.
0637	REF	18	LAST	403	40,2547	4 4745 1	CS	BIT7	PRCTECT OTHERS
0638	REF	8	LAST	404	40,2550	7 0777 1	MASK	DECBRACH	
0639	REF	1			40,2551	7 2600 1	MASK	BRACHCON	ZERC LCM 2 BITS.
0640	REF	9	LAST	406	40,2552	54 777 1	TS	DECBRACH	
0641	REF	21	LAST	406	40,2553	50 137 1	INDEX	INPFL	
0642	REF	1			40,2554	3 2570 1	CAF	SINBLANK -2	BLANK ISOLATED CHAR SEPARATELY
0643	REF	2	LAST	400	40,2555	54 143 0	TS	CCUNT	
0644	REF	2	LAST	400	40,2556	0 3356 1	TC	DSPIN	
0645	REF	22	LAST	406	40,2557	50 137 1	INDEX	INPFL	
0646	REF	2	LAST	405	40,2560	3 2573 1	CAF	DOUBLK -2	
0647	REF	15	LAST	405	40,2561	54 776 0	TS	DSPCCUNT	
0648	REF	2	LAST	403	40,2562	0 2601 1	TC	2BLANK	
0649	REF	18	LAST	403	40,2563	4 4752 1	CS	TWO	
0650	REF	16	LAST	406	40,2564	26 776 0	ADS	DSPCCUNT	
0651	REF	3	LAST	406	40,2565	0 2601 1	TC	2BLANK	
0652	REF	23	LAST	406	40,2566	50 137 1	INDEX	INPFL	
0653	REF	2	LAST	404	40,2567	3 4315 1	CAF	R101 -2	
0654	REF	17	LAST	406	40,2570	54 776 0	TS	DSPCCUNT	SET DSPCCUNT TO LEFT MOST DSP NUMBER
0655	REF	45	LAST	404	40,2571	0 0001 0	TC	L	OF REG. JUST BLANKED
0656					40,2572	00016 0	SINBLANK	CCT	16
0657					40,2573	00005 1		CCT	5
0658					40,2574	00004 0		CCT	4
0659					40,2575	00015 0	DOUBLK	CCT	15
0660					40,2576	00011 1		CCT	11
0661					40,2577	00003 1		CCT	3
0662					40,2600	77774 0	BRACHCON	CCT	77774
0663	2BLANK BLANKS TWO CHAR. PLACE DSP NUMBER OF LEFT CHAR OF THE PAIR INTO								
0664	DSPCCUNT. THIS NUMBER IS LEFT IN DSPCCUNT								
0665	REF	18	LAST	406	40,2601	3 0776 1	2BLANK	CA	DSPCCUNT
0666	REF	1			40,2602	54 021 0	TS	SR	
0667	REF	1			40,2603	4 2614 1	CS	BLANKCON	
0668					40,2604	0 0004 0		INHINT	
0669	REF	2	LAST	406	40,2605	50 021 1	INDEX	SR	
0670	REF	23	LAST	222	40,2606	57 022 0	XCH	DSPTAB	
0671					40,2607	0 0006 1	EXTEND		
0672					40,2610	6 2612 0	BZMF	+2	IF OLD CONTENTS -, NOT 1 CK
0673	REF	6	LAST	223	40,2611	25 015 1	INCR	ACUT	IF OLD CONTENTS +, +1 TO NOT
0674					40,2612	0 0003 1	RELINT		IF -, NOT 1 CK
0675	REF	52	LAST	405	40,2613	0 0002 0	TC	G	
0676					40,2614	04000 0	BLANKCON	CCT	4000

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P1677 ENTER PASS IS THE EXECUTE FUNCTION. HIGHER ORDER ENTERS ARE TO LOAD
 R1678 DATA. THE SIGN OF REQUEST DETERMINES THE PASS, + FOR PASS 0, - FOR HIGHER
 R1679 PASSES.

P1680 MACHINE CADD TO BE SPECIFIED (MCTPS) NOLNS DESIRE AN ECADR TO BE LOADED
 R1681 WHEN USED WITH LOAD VERBS, MONITOR VERBS, OR DISPLAY VERBS (EXCEPT
 R1682 VERB = FIXED MEMORY DISPLAY, WHICH REQUIRES AN ECADR).

0683				41,2000			BANK	41		
0683+1 REF	1			41,2000			SETLOC	PINBALL2		
068302				41,2000			BANK			
06835 REF	1						COUNT*	\$\$/PIN		
0684 REF	1			41,2000	0 3552 0	NVSUBB	TC	NVSUB1	STANDARD LEAD INS. DONT MOVE.	
0685 REF	1			41,2001	0 2001 0	LOADLV1	TC	LOADLV		
A0686									END OF STANDARD LEAD INS.	

0687	REF	63	LAST	405	41,2002	3 4755 1	ENTER	CAF	ZERC	
0688	REF	3	LAST	405	41,2003	55'014 1		TS	CLPASS	
0689	REF	2	LAST	403	41,2004	3 4217 1		CAF	ENDINST	
0690	REF	2	LAST	403	41,2005	54 136 1		TS	ENTRET	
0691	REF	4	LAST	405	41,2006	11'012 1		CCS	REQRET	
0692	REF	1			41,2007	0 2035 0		TC	ENTPAS0	IF +, PASS C
0693	REF	2	LAST	407	41,2010	0 2035 0		TC	ENTPAS0	IF +, PASS J
0694					41,2011	0 2012 0		TC	+1	IF -, NOT PASS 0
0695	REF	1			41,2012	3 2033 0	ENTPAS-I	CAF	MMADREF	
0696	REF	5	LAST	407	41,2013	6 1012 0		AD	REQRET	IF L/ 2 CHAR IN FOR MM CODE, ALARM
0697					41,2014	0 0016 1		EXTEND		AND RECYCLE(DECIDE AT MMCHANG+1).
0699	REF	1			41,2015	1 2027 1		BZF	ACCEPTWD	
0699	REF	9	LAST	404	41,2016	3 6250 0		CAF	THREE	IF DEC, ALARM IF L/ 5 CHAR IN FOR DATA,
0700	REF	10	LAST	406	41,2017	7 0777 1		MASK	DECARNCH	BUT LEAVE REQRET - AND FLASH ON, SC
0701	REF	11	LAST	405	41,2020	10 000 0		CCS	A	OPERATOR CAN SUPPLY MISSING NUMERICAL
0702					41,2021	0 2023 1		TC	+2	CHARACTERS AND CONTINUE.
0703	REF	2	LAST	407	41,2022	0 2027 0		TC	ACCEPTWD	OCTAL. ANY NUMBER OF CHAR OK.
0704	REF	19	LAST	406	41,2023	10 776 0		CCS	DSPCCUNT	
0705	REF	1			41,2024	0 2053 0		TC	GODSPALM	LESS THAN 5 CHAR DEC(DSPCCUNT IS +)
0706	REF	2	LAST	407	41,2025	0 2353 0		TC	GODSPALM	LESS THAN 5 CHAR DEC(DSPCCUNT IS +)
0707					41,2026	0 2027 0		TC	+1	5 CHAR IN (DSPCCUNT IS -)
0708	REF	6	LAST	407	41,2027	4 1012 1	ACCEPTWD	CS	REQRET	5 CHAR IN (DSPCCUNT IS -)
0709	REF	7	LAST	407	41,2030	55'012 1		TS	REQRET	SET REQRET +.
0710	REF	2	LAST	275	41,2031	0 4433 1		TC	FLASHOFF	
0711	REF	8	LAST	407	41,2032	0 1012 0		TC	REQRET	

0712	REF	3	LAST	407	0136		ENTEXIT	=	ENTRET	
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0713	REF	1			41,2033	03437 1	MMADREF	ADRES	MMCHANG +1	ASSUMES TO BEGIN AT MMCHANG.
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0714					41,2134	00034 0	LOWVERB	DFC	2E		LOWER VERB THAT AVOIDS NOUN TEST.
0715	REF	64	LAST	407	41,2135	3 4755 1	ENTPASO	CAF	ZERO		NOUN VERB SUB ENTERS HERE
0716	REF	11	LAST	407	41,2136	54 777 1		TS	DECBPACH		
0717	REF	3	LAST	408	41,2137	4 4360 1		CS	VD1		BLOCK FURTHER NOUN CHAR, SO THAT STRAY
0718	REF	20	LAST	407	41,2140	54 776 0		TS	DSPCCUNT		CHAR DO NOT GET INTO VERB OR NOUN LTS.
0719	REF	9	LAST	405	41,2041	4 1000 1	TESTVB	CS	VERBPFG		IF VERB IS G/E LOWVER, SKIP NOUN TEST.
0720	REF	1			41,2142	55 1040 0		TS	VERBSAVE		SAVE VERB FOR POSSIBLE RECYCLE.
0721	REF	1			41,2143	6 2034 1		AD	LOWVERB		LOWVERB - VB
0722					41,2144	0 0006 1		EXTEND			
0723	REF	1			41,2145	6 2133 1		BZMF	VERBFAN		VERB G/E LOWVERB
0724					41,2146	0 0006 1	TESTAN	EXTEND			VERB L/ LOWVERB
0725	REF	1			41,2147	3 2114 1		CCA	LENNALCC		SWITCH BANKS TO NOUN TABLE READING
0726	REF	3	LAST	306	41,2050	52 006 0		CXCH	Z		ROUTINE.
0727	REF	3	LAST	305	41,2051	50 140 1		INDEX	MIXBF		
0728					41,2052	0 2052 1		TC	+C		
0729					41,2053	0 2055 0		TC	+2		ACFMAL
0730	REF	1			41,2054	0 2221 1		TC	MIXNOUN		MIXED
0731	REF	3	LAST	305	41,2055	10 146 0		CCS	NNADTEM		NORMAL
0732	REF	2	LAST	408	41,2056	0 2131 0		TC	VERBFAN -2		ACFMAL IF +
0733	REF	3	LAST	407	41,2157	3 2253 0		TC	GCDSPALM		ACT IN USE IF +0
0734	REF	1			41,2060	0 2064 1		TC	REGADD		SPECIFY MACHINE CADR IF -
0735	REF	1			41,2161	25 016 1		INCR	NOUNACDR		AUGMENT MACHINE CADR IF -0
0736	REF	1			41,2162	0 4311 0		TC	SETNADD		ECADR FROM NOUNACDR. SETS FB, NOUNACC.
0737	REF	1			41,2063	0 2120 0		TC	INTMCTBS +2		
0738	REF	22	LAST	295	41,2064	3 4735 1	REQADD	CAF	BIT15		SET CLPASS FOR PASSO ONLY
0739	REF	9	LAST	407	41,2065	55 014 1		TS	CLPASS		
0740	REF	2	LAST	407	41,2066	4 4217 0		CS	ENDINST		TEST IF REACHED HERE FROM INTERNAL OR
0741	REF	1			41,2167	6 0136 0		AD	ENTEXIT		FROM EXTERNAL
0742					41,2070	0 0006 1		EXTEND			
0743					41,2071	1 2073 0		BZF	+2		EXTERNAL MACH CADR TO BE SPECIFIED
0744	REF	2	LAST	408	41,2172	0 2116 0		TC	INTMCTBS		
0745	REF	1			41,2073	0 2311 0		TC	REGDATZ		EXTERNAL MACH CADR TO BE SPECIFIED
0746	REF	12	LAST	408	41,2074	10 777 1		CCS	DECBPACH		ALARM AND RECYCLE IF DECIMAL USED
0747	REF	1			41,2075	0 4145 0		TC	ALMCYCLE		FOR MCTBS.
0748	REF	4	LAST	408	41,2076	4 4360 1		CS	VD1		CCTAL USED CK
0749	REF	21	LAST	408	41,2077	54 776 0		TS	DSPCCUNT		BLOCK NOUN CHAR IN
0750	REF	2	LAST	395	41,2180	11 1041 1		CCS	CADRSTOR		
0751					41,2181	0 2104 0		TC	+3		EXTERNAL MCTBS DISPLAY WILL LEAVE FLASH
0752	REF	1			41,2182	0 2105 1		TC	USEADD		ON IF ENCODE ACT = +0.
0753					41,2183	0 2104 0		TC	+1		
0754	REF	1			41,2184	0 4427 1		TC	FLASHCN		
0755	REF	1			41,2185	57 1074 1	USEADD	CXCH	ZREG		
0756	REF	1			41,2186	2 4303 0		TC	SETNACDR		ECADR INTO NOUNACDR. SET FB, NOUNADD.
0757					41,2187	0 0006 1		EXTEND			
0758	REF	2	LAST	408	41,2110	3 2114 1		CCA	LENNALCC		SWITCH BANKS TO NOUN TABLE READING
0759	REF	4	LAST	408	41,2111	52 006 0		CXCH	Z		ROUTINE.
0760	REF	3	LAST	408	41,2112	0 2133 1		TC	VERBFAN		
0761	REF	22	LAST	408	0776				ERANK= DSPCCUNT		

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0762	REF	1		41,2113	02103 1	LCNNLOC	2CAER	LCNNNTAB		
0762	REF	1		41,2114	64111 0					
0763				41,2115	77772 0	NEG5	CCT	77772		
0764	REF	85	LAST	402	41,2116	3 0156 0	INTMCRES	CA	MPAC +2	INTERNAL MACH CADR TO BE SPECIFIED.
0765	REF	2	LAST	408	41,2117	0 4202 0		TC	SETNCADR	ECADR INTO NCUNACDR. SET FB, NCUNACC.
0766	REF	8	LAST	377	41,2120	4 4756 0		CS	FIVE	NVSLB CALL LEFT CADR IN MPAC+2 FOR MACH
0767	REF	10	LAST	408	41,2121	6 1000 0		AD	VFFBREG	CA DR TO BE SPECIFIED.
0768					41,2122	0 0006 1		EXTEND		
0769	REF	4	LAST	408	41,2123	1 2133 0		BZF	VFFBFAN	DONT DISPLAY CADR IF VB = 05.
0770	REF	2	LAST	404	41,2124	3 4321 0		CAF	R301	VB NOT = 05. DISPLAY CADR.
0771	REF	23	LAST	408	41,2125	54 776 0		TS	DSPCCUNT	
0772	REF	2	LAST	408	41,2126	3 1016 1		CA	NCUNACDR	
0773	REF	1			41,2127	0 3271 1		TC	DSPCCTWC	
0774	REF	5	LAST	409	41,2130	0 2133 1		TC	VFFBFAN	
0775	REF	31	LAST	405	41,2131	6 4753 1		AD	CNF	
0776	REF	3	LAST	409	41,2132	0 4202 0		TC	SETNCADR	ECADR INTO NCUNACDR. SETS FB, NCUNACC.
0777	REF	1			41,2133	4 2145 1	VFFBFAN	CS	LST2CCN	
0778	REF	11	LAST	409	41,2134	6 1000 0		AD	VERBREG	VERB-LST2CCN
0779	REF	111	LAST	407	41,2135	10 000 0		CCS	A	
0780	REF	32	LAST	409	41,2136	6 4753 1		AD	ONE	VERB C/ LST2CCN
0781					41,2137	0 2141 1		TC	+2	
0782	REF	1			41,2140	1 2146 0		TC	VBFANDIR	VERB L/ LST2CCN
0783	REF	86	LAST	409	41,2141	54 154 0		TS	MPAC	
0784	REF	4	LAST	232	41,2142	0 4457 0		TC	RELDSP	RELEASE DISPLAY SYST
0785	REF	18	LAST	400	41,2143	0 4635 0		TC	PCSTJUMP	GO TO GCFTVB WITH VB=40 IN MPAC.
0786	REF	1			41,2144	66000 1		CADR	GCFTVR	
0788					41,2145	00250 1	LST2CCN	DEC	40	FIRST LIST2 VERB (EXTENDED VERB)
0790	REF	12	LAST	409	41,2146	51 000 0	VFFBANDIR	INDEX	VFFBREG	
0791	REF	1			41,2147	3 2151 0		CAF	VERBTAB	
0792	REF	2	LAST	271	41,2150	0 4640 1		TC	BANKJUMP	
0793	REF	4	LAST	408	41,2151	62353 0	VFFBTAB	CADR	GCFTSPALM	VFOO ILLEGAL
0794	REF	1			41,2152	62367 1		CADR	DSPA	VB01 DISPLAY OCT COMP 1 (R1)
0795	REF	1			41,2153	62375 1		CADR	DSPR	VB02 DISPLAY OCT COMP 2 (R1)
0796	REF	1			41,2154	62402 0		CADR	DSPC	VB03 DISPLAY OCT COMP 3 (R1)
0797	REF	1			41,2155	62362 1		CADR	DSPAR	VB04 DISPLAY OCT COMP 1,2 (R1,R2)
0798	REF	1			41,2156	62355 0		CADR	DSPARC	VB05 DISPLAY OCT COMP 1,2,3 (R1,R2,R3)
0799	REF	1			41,2157	62525 1		CADR	DECDSP	VB06 DECIMAL DISPLAY
0800	REF	1			41,2160	61025 1		CADR	DSPDDEC	VB07 CP DECIMAL DISPLAY (R1,R2)
0801	REF	5	LAST	409	41,2161	62352 0		CADR	GCFTSPALM	VB08 SPARE
0802	REF	5	LAST	409	41,2162	62353 0		CADR	GCFTSPALM	VB09 SPARE
0803	REF	1			41,2163	61454 0		CADR	CDSPALM	VB10 SPARE
0804	REF	1			41,2164	62236 0		CADR	MCNITCR	VB11 MCNITOR OCT COMP 1 (R1)
0805	REF	2	LAST	409	41,2165	63236 0		CADR	MCNITCR	VB12 MCNITOR OCT COMP 2 (R1)
0806	REF	2	LAST	409	41,2166	63236 0		CAF	MCNITCR	VB13 MCNITOR OCT COMP 3 (R1)
0807	REF	4	LAST	409	41,2167	63236 0		CADR	MCNITCR	VB14 MCNITOR OCT COMP 1,2 (R1,R2)

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0808	REF.	5	LAST	409	41,2170	63236 0	CADR	MCNITOR	VB15	MCNITOR OCT COMP 1,2,3 (R1,R2,R3)
0809	REF	6	LAST	410	41,2171	63236 0	CADR	MCNITOR	VB16	MCNITOR DECIMAL
0810	REF	7	LAST	410	41,2172	63236 0	CADR	MCNITOR	VB17	MCNITOR CP DEC (R1,R2)
0811	REF	7	LAST	409	41,2173	62353 0	CADR	GCDSPALM	VB18	SPARE
0812	REF	8	LAST	410	41,2174	62353 0	CADR	GCDSPALM	VB19	SPARE
0813	REF	9	LAST	410	41,2175	62353 0	CADR	GCDSPALM	VB20	SPARE
0814	REF	1			41,2176	62736 1	CADR	ALCAC	VB21	LCAC COMP 1 (R1)
0815	REF	1			41,2177	62747 1	CADR	BLCAD	VB22	LCAC COMP 2 (R2)
0816	REF	1			41,2200	62764 0	CADR	CLCAC	VB23	LCAC COMP 3 (R3)
0817	REF	1			41,2201	62707 0	CADR	ABLCAD	VB24	LCAC COMP 1,2 (R1,R2)
0818	REF	1			41,2202	62622 0	CADR	ABCLCAD	VB25	LOAD COMP 1,2,3 (R1,R2,R3)
0819	REF	10	LAST	410	41,2203	62353 0	CADR	GCDSPALM	VB26	SPARE
0820	REF	1			41,2204	63361 0	CADR	DSPNEM	VB27	FIXED MEMORY DISPLAY
0821	REF	11	LAST	410	41,2205	62353 0	CADR	GCDSPALM	VB28	THE FOLLOWING VERBS MAKE NO NCLN TEST
0822	REF	12	LAST	410	41,2206	62353 0	CADR	GCDSPALM	VB29	SPARE
0823	REF	1			41,2207	63474 0	CADR	VERGEXEC	VB30	REQLEST EXECUTIVE
0824	REF	1			41,2210	63520 0	CADR	VBRWAIT	VB31	REQLEST WAITLIST
0825	REF	1			41,2211	61521 0	CADR	VERFESEQ	VB32	RESEQUENCE
0826	REF	1			41,2212	61476 0	CADR	VERPRCC	VB33	PROCEED WITHOUT DATA
0827	REF	1			41,2213	61504 1	CADR	VBTERM	VB34	TERMINATE CURRENT TEST OF LCAC REG
0828	REF	1			41,2214	63621 1	CADR	VETSTLTS	VB35	TEST LIGHTS
0829	REF	1			41,2215	12447 0	CADR	SLAP1	VB36	FRESH START
0830	REF	2	LAST	407	41,2216	63436 0	CADR	MMCHANG	VB37	CHANGE MAJOR MODE
0831	REF	13	LAST	410	41,2217	62353 0	CADR	GCDSPALM	VB38	SPARE
0832	REF	14	LAST	410	41,2220	62353 0	CADR	GCDSPALM	VB39	SPARE

R0834 THE LIST2 VERBMAN IS LOCATED IN THE EXTENDED VERB BANK.

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PC025 ANADTAB CONTAINS A RELATIVE ADDRESS, ICADCTAB (IN LOW 10 BITS), REFERRING
 R0836 TO WHERE 3 CONSECUTIVE ADDRESSES ARE STORED (IN ICADCTAB).

R0837 MIXNCLN GETS DATA AND STORES IN MIXTEMP, +1, +2. IT SETS ACUNADD FOR

PC028 MIXTEMP.

0839	REF	4	LAST	408	41,2221	1 146 0	MIXNCLN	CCS	ANADTEM	
0840					41,2222	0 2226 0		TC	+4	+ IN USE
0841	REF	15	LAST	410	41,2223	0 2353 0		TC	GCDSPALM	+0 NOT IN USE
0842					41,2224	0 2226 0		TC	+2	- IN USE
0843					41,2225	0 2226 0		TC	+1	-0 IN USE
0844	REF	10	LAST	280	41,2226	4 6245 0		CS	SIX	
0845	REF	13	LAST	409	41,2227	6 1000 0		AD	VERRREG	
0846					41,2230	0 0036 1		EXTEND		
0847					41,2231	6 2233 1		BZMF	+2	VERE L/E 6
0848	REF	6	LAST	409	41,2232	1 2133 1		TC	VERBEAN	AVOID MIXNCLN SWAP IF VE NOT = DISPLAY
0849	REF	15	LAST	406	41,2233	2 4752 0		CAF	TWO	
0850	REF	1			41,2234	54 117 1	MIXNN1	TS	DECCLAT	
0851	REF	1			41,2235	6 2260 1		AD	MIXAD	
0852	REF	1			41,2236	54 145 0		TS	ACUNADD	SET ACUNADD TO MIXTEMP + K
0853	REF	2	LAST	411	41,2237	50 117 0		INDEX	DECCLAT	GET ICADCTAB ENTRY FOR COMPONENT K
0854	REF	2	LAST	305	41,2240	3 0150 0		CA	ICADITEM	OF NOLN.
0855	REF	1			41,2241	54 122 1		TS	ACUNTEM	
A0856										TEST FOR DP (FOR CCT DISPLAY). IF SO, GET
A0857										MINOR PART ONLY.
0858	REF	1			41,2242	0 3040 0		TC	SERUTMIX	GET SF PCUT NUMBER IN A
0859	REF	1			41,2243	0 2261 0		TC	DPTEST	
0860	REF	1			41,2244	0 2246 0		TC	MIXAN2	NC CP
0861	REF	2	LAST	411	41,2245	24 122 0		INCR	NCUNTEM	CP GET MINOR PART
0862	REF	3	LAST	411	41,2246	3 0122 0	MIXAN2	CA	NCUNTEM	
0863	REF	3	LAST	158	41,2247	7 4356 1		MASK	LCW11	ESLBEK (AC CP) OR (ESUEK)+1 FOR CP
0864	REF	1			41,2250	0 4313 1		TC	SETEBANK	SET FRANK, LEAVE ADDR IN A.
0865	REF	112	LAST	409	41,2251	50 100 1		INDEX	A	PICK UP C(ESUEK) NOT CP
0866					41,2252	3 0000 1		CA	0	OR C((ESLBEK)+1) FOR CP MINOR PART
0867	REF	2	LAST	411	41,2253	50 145 1		INDEX	NCUNADD	
0868					41,2254	56 000 1		XCH	0	STORE IN MIXTEM + K
0869	REF	3	LAST	411	41,2255	10 117 1		CCS	DECCLAT	
0870	REF	1			41,2256	0 2234 0		TC	MIXNN1	
0871	REF	7	LAST	411	41,2257	0 2133 1		TC	VERBEAN	
0872	REF	3	LAST	405	41,2260	0 0125 1	MIXAD	TC	MIXTEMP	
R0873	CPTEST									ENTER WITH SF PCUT NUMBER IN A.
R0874										RETURNS TC L+1 IF NO CP.
R0875										RETURNS TC L+2 IF CP.
0876	REF	113	LAST	411	41,2261	50 000 1	DPTEST	INDEX	A	
0877					41,2262	1 2263 0		TCF	+1	
0878	REF	52	LAST	406	41,2263	0 0002 0		TC	0	CCTAL ONLY NO CP
0879	REF	54	LAST	411	41,2264	0 0002 0		TC	0	FFACT NC CP

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0880	REF	55	LAST	411	41,2265	0 0002 0	TC	Q	DFG AC EP
0881	REF	56	LAST	412	41,2266	0 0002 0	TC	Q	ARITH AC DF
0882	REF	1			41,2267	1 2303 1	TCF	DPTEST1	CP1OUT
0883	REF	2	LAST	412	41,2270	1 2303 1	TCF	DPTEST1	CP2CUT
0884	REF	57	LAST	412	41,2271	0 0002 0	TC	Q	LRPCSCLT AC DF (DATA IN CHANNEL 33)
0885	REF	3	LAST	412	41,2272	1 2303 1	TCF	DPTEST1	CP3OUT
0886	REF	58	LAST	412	41,2273	0 0002 0	TC	Q	FMS AC DF
0887	REF	59	LAST	412	41,2274	0 0002 0	TC	Q	M/S AC DF
0888	REF	4	LAST	412	41,2275	1 2303 1	TCF	DPTEST1	CP4CUT
08881	REF	60	LAST	412	41,2276	0 0002 0	TC	Q	APITH1 AC DF
08882	REF	61	LAST	412	41,2277	0 0002 0	TC	Q	2INTOLT AC DF TO GET HI PART IN MPAC
08883	REF	62	LAST	412	41,2300	0 0002 0	TC	Q	360-CCU NO EP
08884	REF	63	LAST	412	41,2311	0 0002 0	TC	Q	RRANGCUT AC DF
08885	REF	64	LAST	412	41,2312	0 0002 0	TC	Q	RRCOTOLT NO DF
0889	REF	65	LAST	412	41,2313	50 0002 0	DPTEST1	INDEX	Q
0890					41,2314	0 0001 0	TC	1	RETURN TO L+2

0891	REF	3	LAST	406	41,2315	3 4317 0	REQDATX	CAF	R1D1
0892	REF	1			41,2316	1 2312 1	TCF	REQCCM	
0893	REF	2	LAST	404	41,2317	3 4320 1	REQDATY	CAF	R2D1
0894	REF	2	LAST	412	41,2310	1 2312 1	TCF	REQCCM	
0895	REF	3	LAST	409	41,2311	3 4321 0	REQDATZ	CAF	R3D1
0896	REF	24	LAST	405	41,2312	54 776 0	REQCCM	TS	DSFCCUNT
0897	REF	66	LAST	412	41,2313	4 0002 1	CS	Q	
0898	REF	9	LAST	407	41,2314	55 0012 1	TS	REQRET	
0899	REF	79	LAST	405	41,2315	0 4616 1	TC	BANKCALL	
0900	REF	2	LAST	415	41,2316	60526 1	CADR	5BLANK	
0901	REF	2	LAST	408	41,2317	0 4427 1	TC	FLASHON	
0902	REF	2	LAST	406	41,2320	0 0136 0	ENDREQAT	TC	ENTEXIT

0903	REF	8	LAST	403	41,2321	55 0001 0	TS	NCLNREG	
0904	REF	67	LAST	412	41,2322	56 0002 0	UPDATAN	XCF	Q
0905	REF	1			41,2323	54 117 1	TS	UPDATRET	
0906					41,2324	0 0006 1	EXTEND		
0907	REF	3	LAST	408	41,2325	3 2114 1	DCA	LEDNLOC	SWITCH BANKS TO NORM TABLE READING
0908	REF	5	LAST	408	41,2326	52 0006 0	DXCH	Z	ROUTINE.
0909	REF	5	LAST	411	41,2327	10 146 0	CCS	NNADTEM	
0910	REF	23	LAST	409	41,2330	6 4753 1	AC	CNE	ACRNL
0911	REF	1			41,2331	1 2334 0	TCF	PUTADD	
0912	REF	2	LAST	412	41,2332	1 2335 1	TCF	PUTACC +1	MCTBS COUNT CHANGE ACUNACC
0913	REF	3	LAST	412	41,2333	1 2335 1	TCF	PUTACC +1	MCTBI COUNT CHANGE ACUNACC
0914	REF	4	LAST	409	41,2334	0 4303 0	PUTACC	TC	ECADR INTO ACUNACDR. SETS EB, ACUNACC.
0915	REF	4	LAST	403	41,2335	3 4361 1	CAF	NE1	
0916	REF	25	LAST	412	41,2336	54 776 0	TS	DSFCCUNT	
0917	REF	9	LAST	412	41,2337	3 1001 1	CA	NCUNREG	
0918	REF	1			41,2340	1 2347 1	TCF	UPDAT1	

0919	REF	14	LAST	411	41,2341	55 0000 1	TS	VERRREG	
0920	REF	68	LAST	412	41,2342	56 0002 0	UPDATVE	XCF	Q

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0921	REF	2	LAST	412	41,2343	54 117 1		TS	UPDATRET	
0922	REF	5	LAST	408	41,2344	3 4360 0		CAF	VD1	
0923	REF	26	LAST	412	41,2345	54 776 0		TS	DSECCUNT	
0924	REF	15	LAST	412	41,2346	3 1000 0		CA	VERBREG	
0925	REF	19	LAST	409	41,2347	1 4635 0	LPCAT1	TC	PCSTJUMP	CANT USE SWCALL TO GO TO DSPDECVN, SINCE
0926	REF	1			41,2350	61353 0		CADR	GCVNLPDT	UPDATVB CAN ITSELF BE CALLED BY SWCALL.
0927	REF	3	LAST	412	41,2351	0 0117 0		TC	UPDATRET	

0928	REF	2	LAST	408	41,2352	0 4145 0	GCALMCYC	TC	ALMCYCLE	NEEDED BECAUSE BANKJUMP CANT HANDLE F/F.
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0929	REF	20	LAST	412	41,2353	0 4635 0	GCSPALM	TC	POSTJUMP	
0930	REF	2	LAST	409	41,2354	61454 0		CADR	DSPALARM	

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R0931 NOUN TABLES
 R0932 NOUN CODE L/4, NORMAL NOUN CASE. NOUN CODE 6/E 4, MIXED NOUN CASE.
 R0933 FOR NORMAL CASE, NAME TAB CONTAINS ONE PCADR FOR EACH NOUN.
 R0934 +0 INDICATES NOUN NOT USED. - ENTRY INDICATES MACHINE CADR (E OR F) TO
 R0935 BE SPECIFIED. -1 INDICATES CHANNEL TO BE SPECIFIED. -C INDICATES AUGMENT
 R0936 OF LAST MACHINE CADR SUPPLIED.

R0937 FOR MIXED CASE, NAME TAB CONTAINS ONE INDIRECT ADDRESS (IDADDREL) IN LOW
 R0938 10 BITS, AND THE COMPONENT CODE NUMBER IN THE HIGH 5 BITS.

R0939 NNTYPTAB IS A PACKED TABLE OF THE FORM MMMMMNNNNNNFFFFF.

R0940 FOR THE NORMAL CASE, M-S ARE THE COMPONENT CODE NUMBER.
 R0941 N-S ARE THE SF ROUTINE CODE NUMBER.
 R0942 P-S ARE THE SF CONSTANT CODE NUMBER.

R0943 MIXED CASE, M-S ARE THE SF CONSTANT3 CODE NUMBER 3 COMPONENT CASE
 R0944 N-S ARE THE SF CONSTANT2 CODE NUMBER
 R0945 P-S ARE THE SF CONSTANT1 CODE NUMBER
 R0946 N-S ARE THE SF CONSTANT2 CODE NUMBER 2 COMPONENT CASE
 R0947 P-S ARE THE SF CONSTANT1 CODE NUMBER
 R0948 P-S ARE THE SF CONSTANT1 CODE NUMBER 1 COMPONENT CASE

R0949 THERE IS ALSO AN INDIRECT ADDRESS TABLE (IDADETAB) FOR MIXED CASE ONLY.
 R0950 EACH ENTRY CONTAINS ONE PCADR. IDADDREL IS THE RELATIVE ADDRESS OF
 R0951 THE FIRST OF THESE ENTRIES.
 R0952 THERE IS ONE ENTRY IN THIS TABLE FOR EACH COMPONENT OF A MIXED NOUN
 R0953 THEY ARE LISTED IN ORDER OF ASCENDING K.

R0954 THERE IS ALSO A SCALE FACTOR ROUTINE NUMBER TABLE (RTMXTAB) FOR MIXED
 R0955 CASE ONLY. THERE IS ONE ENTRY PER MIXED NOUN. THE FORM IS,
 R0956 CCCCCRRRRSSSSS
 R0957 Q-S ARE THE SF ROUTINE 3 CODE NUMBER 3 COMPONENT CASE
 R0958 R-S ARE THE SF ROUTINE 2 CODE NUMBER
 R0959 S-S ARE THE SF ROUTINE 1 CODE NUMBER
 R0960 R-S ARE THE SF ROUTINE 2 CODE NUMBER 2 COMPONENT CASE
 R0961 S-S ARE THE SF ROUTINE 1 CODE NUMBER

R0962 IN OCTAL DISPLAY AND LOAD (OCT OR DEC) VERBS, EXCLUDE USE OF VERBS WHOSE
 R0963 COMPONENT NUMBER IS GREATER THAN THE NUMBER OF COMPONENTS IN NOUN.
 R0964 (ALL MACHINE ADDRESS TO BE SPECIFIED NOUNS ARE 3 COMPONENT.)

R0967 IN MULTI-COMPONENT LOAD VERBS, NO MIXING OF OCTAL AND DECIMAL DATA
 R0968 COMPONENT WORDS IS ALLOWED. ALARM IF VIOLATION.

R0969 IN DECIMAL LOADS OF DATA, 5 NUMERICAL CHARACTERS MUST BE KEYED IN
 R0970 BEFORE EACH ENTER. IF NOT, ALARM.

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P0971 DISPLAY VERBS

0972	REF	21	LAST	411	41,2355	4 4752 1	DSPABC	CS	TWC
0973	REF	1			41,2356	0 2425 0		TC	COMPTST
0974	REF	3	LAST	411	41,2357	50 145 1		INDEX	NCUNACC
0975					41,2360	4 0002 1		CS	2
0976	REF	41	LAST	337	41,2361	56 132 1		XCH	BUF +2
0977	REF	24	LAST	412	41,2362	4 4753 0	DSPAB	CS	ONE
0978	REF	2	LAST	415	41,2363	0 2426 0		TC	COMPTST
0979	REF	4	LAST	415	41,2364	50 145 1		INDEX	NCUNACC
0980					41,2365	4 0001 1		CS	1
0981	REF	42	LAST	415	41,2366	56 131 1		XCH	BUF +1
0982	REF	1			41,2367	0 2445 0	DSPA	TC	DECTEST
0983	REF	1			41,2370	0 2470 0		TC	TSTFCRDP
0984	REF	5	LAST	415	41,2371	50 145 1		INDEX	NCUNACC
0985					41,2372	4 0000 0		CS	1
0986	REF	43	LAST	415	41,2373	56 130 0	DSPCCM1	XCH	BUF
0987	REF	1			41,2374	0 2407 0		TC	DSPCCM2
0988	REF	25	LAST	415	41,2375	4 4753 0	DSPB	CS	CNF
0989	REF	1			41,2376	0 2441 1		TC	DCOMPTST
0990	REF	6	LAST	415	41,2377	50 145 1		INDEX	NCUNACC
0991					41,2400	4 0001 1		CS	1
0992	REF	1			41,2401	0 2373 1		TC	DSPCCM1
0993	REF	21	LAST	415	41,2402	4 4752 1	DSPC	CS	TWC
0994	REF	2	LAST	415	41,2403	0 2441 1		TC	DCOMPTST
0995	REF	7	LAST	415	41,2404	50 145 1		INDEX	NCUNACC
0996					41,2405	4 0002 1		CS	2
0997	REF	2	LAST	415	41,2406	0 2373 1		TC	DSPCCM1
0998	REF	22	LAST	415	41,2407	4 4752 1	DSPCCM2	CS	TWC
0999	REF	16	LAST	413	41,2410	6 1000 0		AD	VERBREG
1000	REF	114	LAST	411	41,2411	10 000 0		CCS	A
1001	REF	1			41,2412	0 2415 0		TC	DSPCCM3
1002	REF	3	LAST	412	41,2413	0 0136 0		TC	ENTEXIT
1003					41,2414	0 2415 0		TC	+1
1004	REF	1			41,2415	54 122 1	DSPCCM3	TS	DISTEM
1005	REF	115	LAST	415	41,2416	50 000 1		INDEX	A
1006	REF	4	LAST	412	41,2417	2 4317 0		CAF	RID1
1007	REF	27	LAST	413	41,2420	54 776 0		TS	DSPCCM1
1008	REF	2	LAST	415	41,2421	50 122 0		INDEX	DISTEM
1009	REF	44	LAST	415	41,2422	4 0130 1		CS	BUF
1010	REF	2	LAST	415	41,2423	0 3371 1		TC	DSPCCM2
1011	REF	3	LAST	415	41,2424	56 122 0		XCH	DISTEM
1012	REF	2	LAST	415	41,2425	0 2411 1		TC	DSPCCM2 +2

R1013 COMPTST ALARMS IF COMPONENT NUMBER OF VERE(LOAD OR OCT DISPLAY) IS
 R1014 GREATER THAN THE HIGHEST COMPONENT NUMBER OF NOUN.

1016	REF	4	LAST	306	41,2426	54 123 0	COMPTST	TS	SETEMP1	- VERE COMP
1017	REF	69	LAST	412	41,2427	22 002 0		LXCH	0	
1022	REF	1			41,2430	0 2517 0	COMPTST1	TC	GETCOMP	
1023	REF	1			41,2431	0 4331 1		TC	LEFT5	
1024	REF	10	LAST	407	41,2432	7 6250 1		MASK	THREE	NOUN COMP

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1025	REF	5	LAST	415	41,2433	6 0123 1	AD	SFTFMP1	NCLN CCMP - VERB CCMP
1026	REF	116	LAST	415	41,2434	1 010 0	CCS	A	
1027	REF	46	LAST	406	41,2435	0 0001 0	TC	L	NCLN CCMP G/ VERB CCMP
1028	REF	4	LAST	405	41,2436	0 5675 0	TC	CCSHOLE	
1029	REF	16	LAST	411	41,2437	0 2353 0	TC	GCDSFALM	NCUN CCMP L/ VERB CCMP
1030	REF	47	LAST	416	41,2440	0 0001 0	NDCMP1ST TC	L	NCUN CCMP = VERB CCMP

R1031 DCCMP1ST ALARMS IF DECIMAL ONLY BIT (BIT4 OF CCMP CODE NUMBER) = 1.

R1032 IF NOT, IT PERFORMS REGULAR CCMPTEST.

1033	REF	6	LAST	416	41,2441	54 123 0	DCCMP1ST TS	SFTFMP1	- VERB CCMP
1034	REF	70	LAST	415	41,2442	22 002 0	LXCH	Q	
1035	REF	2	LAST	415	41,2443	0 2445 0	TC	DECTEST	
1036	REF	1			41,2444	0 2430 1	TC	COMPTST1	

1037					41,2445	0 0006 1	DECTEST	EXTEND	ALARMS IF DEC ONLY BIT = 1 (BIT4 OF CCMP CODE NUMBER). RETURNS IF NOT.
1038	REF	97	LAST	409	41,2446	22 156 0	QXCH	NPAC +2	
1039	REF	2	LAST	415	41,2447	0 2517 0	TC	GETCCMP	
1040	REF	36	LAST	275	41,2450	7 4736 0	MASK	BIT14	
1041	REF	117	LAST	416	41,2451	10 010 0	CCS	A	
1042	REF	17	LAST	416	41,2452	0 2253 0	TC	GCDSFALM	
1043	REF	88	LAST	416	41,2453	0 0156 0	TC	NPAC +2	

1044	REF	71	LAST	416	41,2454	22 002 0	DCTSTCYC	LXCH	Q	ALARMS AND RECYCLES IF DEC ONLY BIT = 1 (BIT4 OF CCMP CODE NUMBER). RETURNS IF NOT. USED BY LOAD VERES.
1045	REF	3	LAST	416	41,2455	0 2517 0	TC	GETCCMP		
1046	REF	37	LAST	416	41,2456	7 4736 0	MASK	BIT14		
1047	REF	118	LAST	416	41,2457	10 000 0	CCS	A		
1048	REF	3	LAST	412	41,2460	0 4145 0	TC	ALMCYCLE		
1049	REF	48	LAST	416	41,2461	0 0001 0	TC	L		

R1050 NCUNTEST ALARMS IF NC-LOAD BIT (BIT5 OF CCMP CODE NUMBER) = 1.

R1051 IF NOT, IT RETURNS.

1052	REF	72	LAST	416	41,2462	22 002 0	NCUNTEST	LXCH	Q
1053	REF	4	LAST	416	41,2462	0 2517 0	TC	GETCCMP	
1054	REF	119	LAST	416	41,2464	10 000 0	CCS	A	
1055	REF	49	LAST	416	41,2465	0 0001 0	TC	L	
1056	REF	50	LAST	416	41,2466	0 0001 0	TC	L	
1057	REF	18	LAST	416	41,2467	0 2353 0	TC	GCDSFALM	

1058	REF	72	LAST	416	41,2470	22 002 0	TSTCFRPF	LXCH	Q	TEST FOR CF. IF SO, GET MINOR PART ONLY.
1059	REF	6	LAST	412	41,2471	3 0146 1	CA	NNADTEM		
1060	REF	26	LAST	415	41,2472	6 4753 1	AC	CNF		IF NNADTEM = -1, CHANNEL TC BE SPECIFIED
1061					41,2473	0 0006 1	EXTEND			
1062	REF	1			41,2474	1 2506 1	BZF	CFANDSP		
1063	REF	4	LAST	408	41,2475	50 140 1	INDEX	MIXBR		
1064					41,2476	0 2476 0	TC	+0		
1065					41,2477	0 2501 1	TC	+2		NORMAL

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1066	REF	51	LAST	416	41,2500	0 0001 0	TC	L	MIXED CASE ALREADY HANDLED IN MIXCON
1067	REF	1			41,2501	0 3032 0	TC	SFRUTACR	
1068	REF	2	LAST	411	41,2502	0 2261 0	TC	DETEST	
1069	REF	52	LAST	417	41,2503	0 0001 0	TC	L	NC DP
1070	REF	8	LAST	415	41,2504	24 145 1	INCR	NCUNADD	CP E+1 INTO NCUNADD FOR MINOR PART.
1071	REF	53	LAST	417	41,2505	0 0001 0	TC	L	

1072	REF	3	LAST	416	41,2506	3 1016 1	CHANGESP	CA	NCUNACDR
1073	REF	6	LAST	269	41,2507	7 5004 1		MASK	LCW9
10731					41,2510	0 0006 1		EXTEND	
10732	REF	120	LAST	416	41,2511	5 0000 1		INDEX	A
1074					41,2512	00 000 1		READ	0
1075	REF	121	LAST	417	41,2513	4 0000 0		CS	A
1076	REF	3	LAST	415	41,2514	1 2373 0		TCF	CSPCCM1

1077	REF	2	LAST	305	41,2515	00147 0	CCMPICK	ADRES	NNTYPTM
1078	REF	7	LAST	416	41,2516	00146 1		AERFS	NNADTEM

1079	REF	5	LAST	416	41,2517	50 140 1	GETCCMP	INDEX	MIXRR	NORMAL	MIXED
1080	REF	1			41,2520	3 2514 0		CAF	CCMPICK -1	ACRES NNTYPTM	ACRES NNACTEM
1081	REF	122	LAST	417	41,2521	50 000 1		INDEX	A		
1082					41,2522	3 0000 1		CA	0	C(NNTYPTM)	C(NNACTEM)
1083	REF	4	LAST	233	41,2523	7 4350 1		MASK	H15	GET H15 OF NNTYPTAB(NORM) OF NNACTAB(MIX)	
1084	REF	74	LAST	416	41,2524	0 0002 0		TC	G		

1085	REF	5	LAST	416	41,2525	0 2517 0	DFCDSP	TC	GETCCMP		
1086	REF	2	LAST	415	41,2526	0 4331 1		TC	LEFT5		
1087	REF	11	LAST	415	41,2527	7 6250 1		MASK	TFEE		
1088	REF	4	LAST	411	41,2530	54 117 1		TS	DECCOUNT	CCMP NUMER INTO DECCOUNT	
1089	REF	1			41,2531	54 122 1	CSPDCFLT	TS	DECTEM	PICKS UP DATA	
1090	REF	9	LAST	417	41,2532	6 0145 1		AD	NCUNADD	DECTEM 1CCMP +0, 2CCMP +1, 3CCMP +2	
1091	REF	123	LAST	417	41,2533	50 000 1		INDEX	A		
1092					41,2534	4 0000 0		CS	0		

1093	REF	2	LAST	417	41,2535	50 122 0		INDEX	DECTEM		
1094	REF	2	LAST	306	41,2536	57 002 1		XCF	XRF6	CANT USE BUF SINCE DMP USES IT.	
1095	REF	3	LAST	417	41,2537	10 122 1		CCS	DECTEM		

1096	REF	1			41,2540	0 2531 1		TC	DSPDCFLT	MORE TC GET	
1097	REF	65	LAST	418	41,2541	3 4755 1	CSPDCFLT	CAF	ZERO	DISPLAYS DATA	
1098	REF	89	LAST	416	41,2542	54 155 1		TS	MPAC +1	DECCOUNT 1CCMP +0, 2CCMP +1, 3CCMP +2	
1099	REF	90	LAST	417	41,2543	54 156 1		TS	MPAC +2		
1100	REF	5	LAST	417	41,2544	50 117 0		INDEX	DECCOUNT		
1101	REF	5	LAST	415	41,2545	3 4317 0		CAF	P101		
1102	REF	28	LAST	415	41,2546	54 776 0		TS	DSPCOUNT		
1103	REF	6	LAST	417	41,2547	50 117 0		INDEX	DECCOUNT		
1104	REF	3	LAST	417	41,2550	4 1002 0		CS	XRF6		
1105	REF	91	LAST	417	41,2551	54 154 0		TS	MPAC		
1106	REF	1			41,2552	0 3053 1		TC	SFCCNLM	2X(SF CCN NUMB) IN A	

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1107	REF	7	LAST	416	41,2553	54 123 0	TS	SFTMP1	
1108					41,2554	0 0036 1	EXTEND		SWITCH BANKS TO SF CONSTANT TABLE
1109	REF	1			41,2555	3 2367 1	CCA	GTSEOLTL	READING RELTIME.
1110	REF	6	LAST	412	41,2556	52 006 0	EXCH	Z	LOADS SFTMP1, SFTMP2.
1111	REF	6	LAST	417	41,2557	50 143 1	INDEX	MIXBR	
1112					41,2560	0 2560 0	TC	+0	
1113	REF	1			41,2561	0 2564 1	TC	DSPSFNCP	
1114	REF	2	LAST	411	41,2562	0 3040 0	TC	SFRUTMIX	
1115	REF	1			41,2563	0 2577 0	TC	DECDSP3	
1116	PFF	2	LAST	417	41,2564	0 3032 0	DSPSFNCR	TC	SFRUTNCR
1117	PFF	2	LAST	418	41,2565	0 2577 0	TC	DECDSP3	
1118	REF	29	LAST	417	0776			FBANK=	DSPCOLNT
1119	REF	1			41,2566	02141 1	GTSEOLTL	2CADR	GTSEOLT
1119	REF	1			41,2567	64101 0			
1120	PFF	80	LAST	412	41,2570	0 4616 1	DSPDCEND	TC	BANKCALL
1121	REF	1			41,2571	61262 0	CADR	DSPDECWD	ALL SFCUT ROUTINES END HERE
1122	REF	7	LAST	417	41,2572	10 117 1	CCS	DECCUNT	
1123					41,2573	0 2575 1	TC	+2	
1124	REF	4	LAST	415	41,2574	0 0136 0	TC	ENTEXIT	
1125	REF	8	LAST	418	41,2575	54 117 1	TS	DECCUNT	
1126	REF	1			41,2576	0 2541 0	TC	DSPDCPUT	MCRE TO DISPLAY
1127	REF	124	LAST	417	41,2577	50 000 1	DECDSP3	INDEX	A
1128	REF	1			41,2610	3 2602 1	CAD	SFCUTABR	
1129	REF	3	LAST	419	41,2611	0 4640 1	TC	BANKJUMP	
1130	PFF	1			41,2612	61452 0	SFCUTABR	CADR	PREDSPAL
1131	REF	1			41,2613	62570 1		CADR	DSPDCEND
1132	REF	1			41,2614	60615 0		CADR	DEGOLTSF
1133	REF	1			41,2615	60733 0		CADR	ARTOUTSF
1134	REF	1			41,2616	60744 0		CADR	DP1CLTSF
1135	REF	1			41,2617	60751 1		CADR	DP2OUTSF
1136	REF	1			41,2618	60635 1		CADR	LRFCSCUT
1137	PFF	1			41,2611	60753 0		CADR	DP3OUTSF
1138	REF	1			41,2612	65230 0		CADR	HMSCLT
1139	REF	1			41,2613	65303 1		CADR	M/SCLT
1140	REF	2	LAST	418	41,2614	60751 1		CADR	DP2OUTSF
11401	REF	1			41,2615	60740 1		CADR	ARCUTISF
11402	REF	1			41,2616	60766 0		CADR	2INTCLT
11403	REF	1			41,2617	60623 0		CADR	360-CDUC
11404	REF	1			41,2620	60645 0		CADR	RRANGCUT
11405	REF	1			41,2621	60662 0		CADR	RRDCTCUT
1141					41,2622		ENDRTCUT	EQUALS	

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R1142 THE FOLLOWING IS ATYPICAL OF ROUTINE. IT USES MPAC. LEAVES RESL
 R1143 LTS IN MPAC, MPAC+1. ENDS WITH TC DSDCCENT

1144 REF 2 LAST 416 40,2615 SFTLCC BLANKCON +1

11445 REF 2 LAST 399 TO 407: 334 334* COUNT* 14/PIN
 R1145 DEQCUTSF SCALES BY .18 THE LOW 14 BITS OF ANGLE, ADDING .18 FOR
 R1146 NUMBERS IN THE NEGATIVE (AGC) RANGE.

1147 REF 66 LAST 417 40,2615 3 4755 1 DEQCUTSF CAF ZERO
 1148 REF 92 LAST 417 40,2616 54 156 1 TS MPAC +2 SFT INDEX FOR FULL SCALE
 1149 REF 1 40,2617 0 2706 1 TC FIXRANGE
 1150 40,2620 0 2622 0 TC +2 NO AUGMENT NEEDED (SFTMP1 AND 2 ARE 0)
 1151 REF 1 40,2621 0 2701 1 TC SFTALG SFT AUGMENTER ACCORDING TO C(MPAC +2)
 11511 REF 1 40,2622 1 2717 1 TC DEGCOM

R1152 360-CDU COMPUTES 360 - CDU ANGLE IN MPAC, STORES RESULT IN MPAC AND
 R11521 GOES TO DEQCUTSF.

11522 REF 1 40,2623 0 2625 1 360-CDU TC 360-CDU
 11523 REF 2 LAST 418 40,2624 0 2615 1 TC DEQCUTSF
 11524 REF 93 LAST 419 40,2625 3 0154 1 360-CDU CA MPAC
 11525 REF 6 LAST 382 40,2626 7 4733 0 MASK PCSMAX IF ANGLE IS 0 OR 180 DEGREES, DO NOTHING
 11526 40,2627 0 0016 1 EXTEND
 11527 REF 1 40,2630 1 2634 0 BZF 360-CDU
 11528 REF 94 LAST 419 40,2631 4 0154 0 CS MPAC COMPUTE 360 DEGREES MINUS ANGLE
 11529 REF 37 LAST 416 40,2632 6 4753 1 AD CNF
 115291 REF 55 LAST 419 40,2633 54 154 0 TS MPAC
 115292 REF 75 LAST 417 40,2634 0 0002 0 360-CDU TC 0

R1153 LRPOSCLT DISPLAYS 0,1,2,OR 3 (WHOLE) FOR CHANNEL 33,BITS 7-6 = 11,10,
 R1154 01,11 RESPECTIVELY.

1155 40,2635 0 0006 1 LRPOSCLT EXTEND
 1156 REF 6 LAST 278 40,2636 00 033 1 READ CHAN33
 1157 40,2637 0 0006 1 EXTEND
 1158 REF 20 LAST 376 40,2640 7 4742 0 MP BIT10 BITS 7-6 TO BITS 2-1
 1159 40,2641 4 0011 0 COM
 1160 REF 12 LAST 417 40,2642 7 6250 1 MASK THREE
 1161 REF 56 LAST 419 40,2643 54 154 0 TS MPAC
 1162 REF 2 LAST 418 40,2644 0 2733 1 TC ARTQUTSF DISPLAY AS WHOLE

R1163 PRANGCUT AND PRQUTOUT CONVERT PR RANGE AND RANGE RATE FROM SP 15 BIT
 R11633 MAGNITUDE TO DP AND THEN SCALE FOR DISPLAY.

11636 REF 1 40,2645 0 2671 0 PRANGCLT TC RRSPTCDF CONVERT TO DP.
 11639 REF 27 LAST 324 40,2646 4 0110 0 CS RADMODES BIT 3 OF FLAG12 = HI SCALE
 11642 REF 20 LAST 300 40,2647 7 4751 1 MASK BIT3

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11646	REF	125	LAST	418	40,2650	10 001 0	CCS	A		
11649	REF	1			40,2651	7 2657 1	TC	SCALELO		DATA IS IN LO SCALE.
11652	REF	97	LAST	419	40,2652	52 155 1	EXCH	MPAC		DATA IS IN H1 SCALE, MF BY 8.
11656	REF	126	LAST	420	40,2653	20 001 1	DAS	A		
11659	REF	127	LAST	420	40,2654	20 001 1	DAS	A		
11663	REF	128	LAST	420	40,2655	20 001 1	DAS	A		
11666	REF	98	LAST	420	40,2656	52 155 1	EXCH	MPAC		
11669	REF	2	LAST	401	40,2657	0 7106 1	SCALELO	TC	DMF	SCALE FOR DISPLAY,
11672	REF	8	LAST	418	40,2660	00123 1	ADRES	SFTMP1		
11676	REF	1			40,2661	7 2745 0	TC	L14/CUT		AND CC TO ARITHOP1.
11679	REF	2	LAST	419	40,2662	0 2671 0	RPSPTCCT	TC	RRSPTCOP	CONVERT TO CP.
11683					40,2663	0 0016 1	EXTEND			
11686	REF	1			40,2664	4 2670 0	ECS	BIASPCCT		SUBTRACT BIAS OF 17000 COUNTS.
11689	REF	99	LAST	420	40,2665	20 155 1	DAS	MPAC		
11692	REF	2	LAST	420	40,2666	0 2657 1	TC	SCALELO		SCALE FOR DISPLAY.
11696					40,2667	00001 0	BIASPCCT	2DFC	17000	
11696					40,2670	01150 1				
11699	REF	7	LAST	419	40,2671	3 4733 1	RPSPTCOP	CAF	PCSNAX	CONVERT SP 15 BIT MAG TO CP.
1171	REF	100	LAST	420	40,2672	7 0154 0	MASK	MPAC		
11712	REF	101	LAST	420	40,2673	54 155 1	TS	MPAC +1		
11716	REF	102	LAST	420	40,2674	3 0154 1	CA	MPAC		
11719					40,2675	6 0000 1	DOUBLE			
11723	REF	15	LAST	297	40,2676	7 4753 0	MASK	BIT1		
11726	REF	103	LAST	420	40,2677	54 154 0	TS	MPAC		
11729	REF	76	LAST	419	40,2700	0 0002 0	TC	Q		
1174					40,2711	0 0006 1	SETALC	EXTEND		LOADS SFTMP1 AND SFTMP2 WITH THE
1175	REF	104	LAST	420	40,2702	5 0156 0	INDEX	MPAC	+2	CP AUGMENTER CONSTANT
1176	REF	1			40,2703	3 2730 1	ECA	DEGTAB		
1177	REF	9	LAST	420	40,2704	52 124 1	EXCH	SFTMP1		
1178	REF	77	LAST	420	40,2705	0 0002 0	TC	Q		
1179	REF	105	LAST	420	40,2706	10 154 0	FIXRANGE	CCS	MPAC	IF MPAC IS + RETURN TO L+1
1180	REF	78	LAST	420	40,2707	0 0002 0	TC	Q		IF MPAC IS - RETURN TO L+2 AFTER
1181	REF	79	LAST	420	40,2710	0 0002 0	TC	Q		MASKING OUT THE SIGN BIT
1182					40,2711	1 2712 0	TCF	+1		
1183	REF	23	LAST	408	40,2712	4 4725 0	CS	BIT15		
1184	REF	106	LAST	420	40,2713	7 0154 0	MASK	MPAC		
1185	REF	107	LAST	420	40,2714	54 154 0	TS	MPAC		
1186	REF	80	LAST	420	40,2715	50 002 0	INDEX	Q		
1187					40,2716	0 0001 0	TC	1		
1188					40,2717	0 0006 1	DEGCON	EXTEND		LOADS MULTIPLIER, DOFS SHORTMP, AND
1189	REF	108	LAST	420	40,2720	5 0156 0	INDEX	MPAC	+2	ADDS AUGMENTER.
1190	REF	2	LAST	420	40,2721	3 2730 1	ECA	DEGTAB		
1191	REF	109	LAST	420	40,2722	52 155 1	EXCH	MPAC		ADJUSTED ANGLE IN A
1192	REF	2	LAST	401	40,2723	0 7312 0	TC	SHORTMP		
1193	REF	10	LAST	420	40,2724	52 124 1	EXCH	SFTMP1		

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R12234 RXC1-RXC2.

12235	REF	3	LAST	412	40,2766	0 2536 0	2INTOUT	TC	5BLANK	TC BLANK RXD3
122355	REF	2	LAST	403	40,2767	0 2413 0		TC	+CN	TURN CN + SIGN
12236	REF	117	LAST	421	40,2770	3 0154 1		CA	MPAC	
12237	REF	1			40,2771	0 3342 1		TC	DSPDECVN	DISPLAY 1ST INTEGER (LIKE VERB AND NOUN)
122371	REF	13	LAST	419	40,2772	4 6250 1		CS	THPFE	
122372	REF	9	LAST	418	40,2773	5 117 0		INDEX	DECCUNT	
122373	REF	6	LAST	417	40,2774	6 4317 0		AC	R1D1	RXD4
122374	REF	30	LAST	418	40,2775	54 776 0		TS	DSPCCUNT	
122375	REF	2	LAST	421	40,2776	0 3003 1		TC	READLC	GET 2ND INTEGER
122376	REF	118	LAST	422	40,2777	3 0155 0		CA	MPAC +1	
122377	REF	2	LAST	422	40,3000	0 3342 1		TC	DSPDECVN	DISPLAY 2ND INTEGER (LIKE VERB AND NOUN)
122378	REF	22	LAST	421	40,3001	1 4635 0		TC	POSTJUMP	
122379	REF	3	LAST	421	40,3002	62572 0		CADR	DSPDECVN +2	

R1224 READLC PICKS UP FRESH DATA FOR BOTH HI AND LC AND LEAVES IT IN

R1225 MPAC, MPAC+1. THIS IS NEEDED FOR TIME DISPLAY. IT ZEROES MPAC+2, BUT

R1226 CCPS NOT FORCE TPACPF.

1227	REF	82	LAST	421	40,3003	56 002 0	READLC	XCF	Q	
1228	REF	8	LAST	98	40,3004	54 144 1		TS	TEM4	
1229	REF	7	LAST	418	40,3005	50 140 1		INDEX	MIXBR	
1230					40,3006	0 3706 1		TC	+D	
1231	REF	1			40,3007	0 2023 0		TC	RCLONCR	
1232	REF	11	LAST	422	40,3010	50 117 0		INDEX	DECCUNT	
1233	REF	3	LAST	411	40,3011	3 0150 0		CA	ICACITEM	GET ICACITEM ENTRY FOR CCMP K OF NOUN.
1234	REF	4	LAST	411	40,3012	7 4356 1		MASK	LCW11	E SUBK
1235	REF	2	LAST	411	40,3013	0 4213 1		TC	SETEBANK	SET EE, LEAVE EADDRS IN A.
1236					40,3014	0 0005 1	READLC1	EXTEND		MIXED NORMAL
1237	REF	129	LAST	421	40,3015	5 0000 1		INDEX	A	C(ESUBK) C(E)
1238					40,3016	3 0001 0		DCA	0	C((E SUBK)+1) C(E+1)
1239	REF	119	LAST	422	40,3017	52 155 1		EXCH	MPAC	
1240	REF	67	LAST	419	40,3020	3 4755 1		CAF	ZFR0	
1241	REF	120	LAST	422	40,3021	54 156 1		TS	MPAC +2	
1242	REF	9	LAST	422	40,3022	0 0144 0		TC	TEM4	
1243	REF	10	LAST	417	40,3023	3 0145 1	RCLONCR	CA	NOUNACD	E
1244	REF	1			40,3024	0 3014 1	ENDRCLC	TC	READLC1	

1245					42,3230			BANK	42	
124501	REF	3	LAST	315	42,3230			SETLCC	PINBALL3	
124502					42,3230			BANK		

12455	REF	1						COUNT*	\$\$/PIN	
1246	REF	81	LAST	418	42,3230	0 4616 1	HMSOUT	TC	BANKCALL	READ FRESH DATA FOR HI AND LC INTO MPAC,
1247	REF	3	LAST	422	42,3231	61F03 0		CADR	READLC	MPAC+1.
1248	REF	3	LAST	421	42,3232	0 7262 0		TC	TPAGREF	MAKE CP DATA AGREE

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1249	REF	1		42,2233	0 3417 0	TC	SEPSECNR	LEAVE FRACT SEC/60 IN MPAC, MPAC+1. LEAVE
A1250								WHOLE MIN IN BIT13 OF LCTFMCLT AND ARCV
1251	REF	4	LAST	421	42,2234	0 7106 1	TC	DMP
1252	REF	1			42,2235	0 3271 0	ADRES	SECCN2
1253	REF	4	LAST	412	42,2236	3 4321 0	CAF	R3D1
1254	REF	31	LAST	422	42,2237	54 776 0	TS	DSFCCUNT
1255	REF	82	LAST	422	42,2240	0 4616 1	TC	BANKCALL
1256	REF	2	LAST	418	42,2241	61262 0	CADR	DSFDECWD
1257	REF	1			42,2242	0 3435 0	TC	SEPMIN
1258	REF	1			42,2243	3 3273 1	CAF	MINCON2
1259	REF	121	LAST	422	42,2244	56 154 1	XCH	MPAC
1260	REF	1			42,2245	55 1006 1	TS	HITEMCUT
1261	REF	2	LAST	423	42,2246	3 3274 0	CAF	MINCON2 +1
1262	REF	122	LAST	423	42,2247	56 155 0	XCH	MPAC +1
1263	REF	3	LAST	421	42,2250	0 4415 0	TC	PRSHRTMP
A1264								USE ONLY FRACT MIN/60 MOD 60
1265	REF	3	LAST	412	42,2251	3 4227 1	CAF	R2D1
1266	REF	32	LAST	423	42,2252	54 776 0	TS	DSPCOUNT
1267	REF	83	LAST	423	42,2253	0 4616 1	TC	BANKCALL
1268	REF	3	LAST	423	42,2254	61262 0	CADR	DSFDECWD
1269					42,2255	0 0000 1	EXTEND	MINUTES, SECONDS HAVE BEEN REMOVED
1270	REF	1			42,2256	3 3300 1	CCA	HRCEN1
1271	REF	123	LAST	423	42,2257	52 155 1	DXCH	MPAC
1272	REF	2	LAST	423	42,2260	3 1006 0	CA	HITEMCUT
1273	REF	4	LAST	423	42,2261	0 4415 0	TC	PRSHRTMP
A1274								USE WHOLE HOURS
1275	REF	7	LAST	422	42,2262	3 4317 0	CAF	R1D1
1276	REF	33	LAST	423	42,2263	54 776 0	TS	DSPCOUNT
1277	REF	84	LAST	423	42,2264	0 4616 1	TC	BANKCALL
1278	REF	4	LAST	423	42,2265	61262 0	CADR	DSFDECWD
1279	REF	5	LAST	418	42,2266	0 0000 0	TC	ENTEXIT
1280					42,2267	25660 0	SECON1	2DEC* 1.666666666 E-4 R12* 2EXP12/6000
1281					42,2270	31742 1		
1282					42,2271	01727 1	SFCN2	OCT 01727 .06 FOR SECCNCS DISPLAY
1283					42,2272	01217 1		CCT 01217
1284					42,2273	00011 1	MINCON2	OCT 00011 .0006 FOR MINUTES DISPLAY
1285					42,2274	32445 0		OCT 32445
1286					42,2275	02104 0	MINCON1	CCT 02104 .066..66 UPPEE BY 2EXP-28
1287					42,2276	10422 1		OCT 10422
1288					42,2277	05174 0	HRCEN1	2DEC .16384
1289					42,2300	13261 0		
1290					42,2301	00000 1		CCT 00000
1291					42,2302	00062 0	RADCCN	CCT 00062 .5 SEC
1292	REF	85	LAST	423	42,2303	0 4616 1	M/SOLT	TC BANKCALL
1293	REF	4	LAST	422	42,2304	61003 0		CADR READPLC
1294	REF	4	LAST	422	42,2305	0 7262 0		TC TRAGREE
1295	REF	124	LAST	423	42,2306	10 154 0	CCS	MPAC
								READ FRESH DATA FOR FI AND LC INTO MPAC,
								MPAC+1.
								MAKE CF DATA AGREE
								IF MAG CF (MPAC, MPAC+1) C/ 59 M 59 S,

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1294				42,3307	0 3311 1	TC	+2	DISPLAY 59E59, WITH PROPER SIGN.
1295	REF	1		42,3310	0 3342 1	TC	M/SNCRM	MPAC = +C. L/ 59M58.5S
1296	REF	1		42,3311	6 3377 1	AD	M/SCCN1	- HI PART OF (59M58.5S) +1 FOR CCS
1297	REF	130	LAST	42,3312	10 3300 0	CCS	A	MAG OF MPAC - HI PART OF (59M58.5S)
1298	REF	1		42,3313	0 3326 0	TC	M/SLIMIT	G/ 59M58.5S
1299	REF	2	LAST	42,3314	0 3342 1	TC	M/SNCRM	ORIGINAL MPAC = -C. L/ 59M58.5S
1300	REF	3	LAST	42,3315	0 3342 1	TC	M/SNCRM	L/ 59M58.5S
1301	REF	125	LAST	42,3316	10 155 1	CCS	MPAC +1	MAG OF MPAC = HI PART OF 59M58.5S
1302				42,3317	0 3321 1	TC	+2	
1303	REF	4	LAST	42,3320	0 3342 1	TC	M/SNCRM	MPAC+1 = +C. L/ 59M58.5S
1304	REF	1		42,3321	6 3410 0	AD	M/SCCN2	- LO PART OF (59M58.5S) +1 FOR CCS
1305	REF	131	LAST	42,3322	10 000 0	CCS	A	MAG OF MPAC+1 - LC PART OF (59M58.5S)
1306	REF	2	LAST	42,3323	0 3326 0	TC	M/SLIMIT	G/ 59M58.5S
1307	REF	5	LAST	42,3324	0 3342 1	TC	M/SNCRM	ORIGINAL MPAC+1 = -C. L/ 59M58.5S
1308	REF	6	LAST	42,3325	0 3342 1	TC	M/SNCRM	L/ 59M58.5S
1309	REF	126	LAST	42,3326	10 154 0	M/SLIMIT CCS	MPAC	= 59M58.5S LIMIT
1310	REF	1		42,3327	3 3402 0	CAF	M/SCCN3	MPAC CANNOT BE +/- 0 AT THIS POINT.
1311	REF	1		42,3330	3 3337 0	TC	+LIMIT	FORCE MPAC, MPAC+1 TO +/- 59M59.5S
1312	REF	2	LAST	42,3331	4 3402 0	CS	M/SCCN3	
1313	REF	127	LAST	42,3332	54 154 0	TS	MPAC	WILL DISPLAY 59M59S IN ESPDECR
1314	REF	3	LAST	42,3333	4 3403 1	CS	M/SCCN3 +1	
1315	REF	128	LAST	42,3334	54 155 1	LIMITCCN TS	MPAC +1	
1316	REF	1		42,3335	3 3401 1	CAF	NCRNADR	SET RETURN TO M/SNCRM+1.
1317	REF	2	LAST	42,3336	0 3420 1	TC	SEPSECR +1	
1318	REF	129	LAST	42,3337	54 154 0	+LIMIT TS	MPAC	
1319	REF	4	LAST	42,3340	3 3403 0	CAF	M/SCCN3 +1	
1320	REF	1		42,3341	0 3334 0	TC	LIMITCCN	
1321	REF	1		42,3342	0 3404 1	M/SNCRM TC	SEPSEC	LEAVE FRACT SEC/60 IN MPAC, MPAC+1. LEAVE
A1322								WHOLE MIN IN BIT13 OF LCTENCLT AND ABOVE
1323	REF	1		42,3343	3 3375 0	CAF	FISFCCN	USE ONLY FRACT SEC/60 MOD 60
1324	REF	3	LAST	42,3344	0 7312 0	TC	SHORTMP	MULT BY .6 + 2EXP-14
1325	REF	14	LAST	42,3345	4 6250 1	CS	THREE	GIVES SEC/100 MOD 60
1326	REF	34	LAST	42,3346	26 776 0	ADS	DSPPCNT	DSPPCLNT ALREADY SET TO RXD1
1327	REF	86	LAST	42,3347	0 4616 1	TC	BANKCALL	DISPLAY SEC MOD 60 IN D4C5.
1328	REF	1		42,3350	61322 0	CADR	DSPPC2NR	
1329	REF	68	LAST	42,3351	3 4755 1	CAF	ZEPC	
1330	REF	5	LAST	42,3352	54 124 1	TS	CORE	
1331	REF	23	LAST	42,3353	4 4752 1	CS	TWO	
1332	REF	11	LAST	42,3354	50 117 0	INDEX	DECCUNT	
1333	REF	8	LAST	42,3355	6 4317 0	AD	RID1	RXD3
1334	REF	3	LAST	42,3356	54 143 0	TS	CCUNT	
1335	REF	37	LAST	42,3357	0 4616 1	TC	BANKCALL	BLANK MIDDLE CHAR
1336	REF	3	LAST	42,3360	61356 0	CADR	DSPIN	
1337	REF	2	LAST	42,3361	0 3435 0	TC	SEPMIN	REMOVE REST OF SECONDS
1338	REF	130	LAST	42,3362	56 155 0	XCF	MPAC +1	LEAVE FRACT MIN/60 IN MPAC+1
1339				42,3363	0 0006 1	EXTEND		USE ONLY FRACT MIN/60 MOD 60
1340	REF	1		42,3364	7 2376 1	MP	HIMINCCN	MULT BY .6 + 2EXP-7
1341	REF	131	LAST	42,3365	52 155 1	EXCF	MPAC	GIVES MIN/100 MOD 60
1342	REF	12	LAST	42,3366	50 117 0	INDEX	DECCUNT	
1343	REF	9	LAST	42,3367	3 4317 0	CAF	RID1	RXD1

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1344	REF	35	LAST	424	42,3370	54 776 0	TS	DSPCCUNT		
1345	REF	88	LAST	424	42,3371	0 4616 1	TC	BANKCALL		DISPLAY MIN MOD 60 IN C102.
1346	REF	2	LAST	424	42,3372	61322 0	CADR	DSPDC2NR		
1347	REF	23	LAST	422	42,3373	0 4625 0	TC	PCSTJLMP		
1348	REF	4	LAST	422	42,3374	62572 0	CADR	DSPDCEND	+2	
1349					42,3375	23147 1	HISFCCN	CCT	23147	.6 + 2EXP-14
1350					42,3376	23346 1	HIMINCON	CCT	23346	.6 + 2EXP-7
1351					42,3377	77753 0	M/SCCN1	CCT	77753	- HI PART OF (59M58.5S) +1
1352					42,3400	41126 1	M/SCCN2	CCT	41126	- LC PART OF (59M58.5S) +1
1353	REF	7	LAST	424	42,3411	03343 0	NORMADR	ADRES	M/SNCRM	+1
1354					42,3402	00025 0	M/SCCN3	CCT	00025	59M 58.5S
1355					42,3412	37016 1	OCT		37016	
1356	REF	132	LAST	424	42,3404	10 155 1	SEPSEC	CCS	MPAC	+1
1357	REF	1			42,3405	1 3414 1	TCF	PCSEC		IF +, ROUND BY ADDING .5 SEC
1358	REF	2	LAST	425	42,3406	1 3414 1	TCF	PCSEC		IF -, ROUND BY SUBTRACTING .5 SEC
1359					42,3407	1 3410 0	TCF	+1		FINDS TIME IN MPAC, MPAC+1
1360					42,3410	0 0006 1	EXTEND			ROUNDS OFF BY +/- .5 SEC
1361	REF	1			42,3411	4 3312 1	CCS	RNDCCN	-1	LEAVES WHOLE MIN IN BIT13 OF
1362	REF	133	LAST	425	42,3412	20 155 1	SEPSEC1	CAS	MPAC	LOTENCLT AND ABOVE.
1363	REF	3	LAST	424	42,3413	1 3417 1	TCF	SEPSECNR		LEAVES FRACT SEC/60 IN MPAC, MPAC+1.
1364					42,3414	0 0006 1	POSEC	EXTEND		
1365	REF	2	LAST	425	42,3415	3 3302 0	DCA	RNDCCN	-1	
1366	REF	1			42,3416	1 3412 1	TCF	SEPSEC1		
1367	REF	83	LAST	422	42,3417	56 002 0	SEPSECNR	XCH	Q	THIS ENTRY AVOIDS ROUNDING BY .5 SEC
1368	REF	1			42,3420	54 144 1	TS	SEPSCRET		
1369	REF	5	LAST	423	42,3421	0 7106 1	TC	DMP		MLLT BY 2EXP12/6000
1370	REF	1			42,3422	02267 1	ADRES	SECON1		GIVES FRACT SEC/60 IN BIT12 OF MPAC+1
1371					42,3423	0 0006 1	EXTEND			AND BELOW.
1372	REF	134	LAST	425	42,3424	3 0155 0	DCA	MPAC		SAVE MINUTES AND HOURS
1373	REF	3	LAST	423	42,3425	53007 0	CXCH	HITEMCUT		
1374	REF	1			42,3426	0 4404 0	TC	TPSL1		
1375	REF	2	LAST	425	42,3427	0 4404 0	TC	TPSL1		GIVES FRACT SEC/60 IN MPAC+1, MPAC+2.
1376	REF	69	LAST	424	42,3430	3 4755 1	CAS	ZERO		
1377	REF	135	LAST	425	42,3431	56 156 0	XCH	MPAC	+2	LEAVE FRACT SEC/60 IN MPAC, MPAC+1.
1378	REF	136	LAST	425	42,3432	56 155 0	XCH	MPAC	+1	
1379	REF	137	LAST	425	42,3433	56 154 1	XCH	MPAC		
1380	REF	2	LAST	425	42,3434	0 3144 0	TC	SEPSCRET		
1381	REF	84	LAST	425	42,3435	56 002 0	SEPMIN	XCH	Q	FINDS WHOLE MINUTES IN BIT13
1382	REF	1			42,3436	54 144 1	TS	SEPMNRET		OF LOTENCLT AND ABOVE.
1383	REF	1			42,3437	3 1007 1	CA	LOTENCLT		REMOVES REST OF SECONDS.
1384					42,3440	0 4406 1	EXTEND			LEAVES FRACT MIN/60 IN MPAC+1.
1385	REF	21	LAST	419	42,3441	7 4751 1	MP	BIT3		LEAVES WHOLE HOURS IN MPAC.
1386					42,3442	0 0006 1	EXTEND			SR 12, THROW AWAY LP.
1387	REF	23	LAST	294	42,3443	7 4737 1	MP	BIT13		SR 2, TAKE FROM LP. = SL 12.

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1388	REF 138	LAST	425	42,3444	22 155 0	LXCF	MFAC	+1	THIS FORCES BITS 12-1 TO 0 IF +,
A1389									FORCES BITS 12-1 TO 1 IF -.
1390	REF 4	LAST	425	42,3445	3 1006 0	CA	HITEMCUT		
1391	REF 139	LAST	426	42,3446	54 154 0	TS	MFAC		
1392	REF 6	LAST	425	42,3447	0 7116 1	TC	DMP		MULT BY 1/15
1393	REF 1			42,3450	03275 1	ADRES	MINCCN1		GIVES FRACT MIN/60 IN MPAC+1.
1394	REF 2	LAST	425	42,3451	0 0144 0	ENDSPMIN	TC	SEPMARET	GIVES WHOLE FCURS IN MFAC.

R1395 THIS IS A SPECIAL PURPOSE VERE FOR DISPLAYING A DOUBLE PRECISION AGC
 R1396 WORD AS 10 DECIMAL DIGITS ON THE AGC DISPLAY PANEL. IT CAN BE USED WITH
 R1397 ANY NCUN, EXCEPT MIXED NCUNS. IT DISPLAYS THE CONTENTS
 R1398 OF THE REGISTER NCUNADD IS POINTING TO . IF USED WITH NCUNS WHICH ARE
 R1399 INHERENTLY NOT CP SUCH AS THE CDU COUNTERS THE DISPLAY WILL BE GARBAGE.
 R1400 DISPLAY IS IN R1 AND R2 ONLY WITH THE SIGN IN R1.

1401	REF 1			40,3025		SFTLCC	ENDRELC	+1	
14115	REF 3	LAST	419 TO	422:	136 470*	COUNT*	\$\$/PIN		
1402	REF 8	LAST	422	40,3025	50 140 1	DSPDPEEC	INDEX	MIXBF	
1403				40,3026	0 3026 0	TC	+0		
1404				40,3027	0 3031 0	TC	+2		NORMAL NCUN
1405	REF 3	LAST	413	40,3030	0 3454 1	TC	DSPALARM		
1406				40,3031	0 0006 1	EXTEND			
1407	REF 11	LAST	422	40,3032	5 0145 1	INDEX	NCUNADD		
1408				40,3033	3 0001 0	DCA	0		
1409	REF 140	LAST	426	40,3034	52 155 1	CXCH	MPAC		
1410	REF 10	LAST	424	40,3035	3 4317 0	CAF	R101		
1411	REF 36	LAST	425	40,3036	54 776 0	TS	DSPCCUNT		
1412	REF 70	LAST	425	40,3037	3 4755 1	CAF	ZERO		
1413	REF 141	LAST	426	40,3040	54 156 1	TS	MFAC +2		
1414	REF 5	LAST	423	40,3041	0 7262 0	TC	TPAGREF		
1415	REF 1			40,3042	0 3327 1	TC	DSP2DEC		
1416	REF 6	LAST	423	40,3043	0 0136 0	ENDDFEEC	TC	ENTEXIT	

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R1417 LOAD VERBS IF ALARM CONDITION IS DETECTED DURING EXECUTE,
 R1418 CHECK FAIL LIGHT IS TURNED ON AND ENDJOB. IF ALARM CONDITION IS
 R1419 DETECTED DURING ENTER OF DATA, CHECK FAIL IS TURNED ON AND IT RECYCLES
 R1420 TO EXECUTE OF ORIGINAL LOAD VERB. RECYCLE CAUSED BY 1) DECIMAL MACHINE
 R1421 CADR 2) MIXTURE OF OCTAL/DECIMAL DATA 3) OCTAL DATA INTO DECIMAL
 R1422 ONLY NOUN 4) DFC DATA INTO OCT ONLY NOUN 5) DATA TOO LARGE FOR SCALE
 R1423 6) FEWER THAN 3 DATA WORDS LOADED FOR HRS, MIN, SEC NOUN.8(2)-(6) ALARM
 R1424 AND RECYCLE OCCUR AT FINAL ENTER OF SET. (1) ALARM AND RECYCLE OCCUR AT
 R1425 ENTER OF CADR.

1426 RFF 1 41,2622 SETLOC ENDROUT

14265 RFF 2 LAST 407 TO 419: 402 402* COUNT* \$1/PIN

1427 RFF 24 LAST 424 41,2622 4 4752 1 ABCLOAD CS TWC

1428 RFF 3 LAST 415 41,2623 0 2426 0 TC COMPTST

1429 RFF 1 41,2624 0 2462 0 TC NCUNTEST

1430 RFF 1 41,2625 3 3012 1 CAF VBSP1LD

1431 RFF 2 LAST 405 41,2626 0 2341 0 TC UPDATVB -1

1432 RFF 1 41,2627 0 2305 0 TC REQDATX

1433 RFF 1 41,2630 3 3013 0 CAF VBSP2LD

1434 RFF 3 LAST 427 41,2631 0 2341 0 TC UPDATVB -1

1435 RFF 1 41,2632 0 2307 1 TC REQDATY

1436 RFF 1 41,2633 3 3014 1 CAF VBSP3LD

1437 RFF 4 LAST 427 41,2634 0 2341 0 TC UPDATVB -1

1438 RFF 2 LAST 408 41,2635 0 2211 0 TC REQDATZ

1439 RFF 12 LAST 421 41,2636 4 6245 0 PUTXYZ CS SIX TEST THAT THE 3 DATA WORDS LOADED ARE

1440 RFF 1 41,2637 0 3015 0 TC ALLOC/CC ALL DEC OR ALL OCT.

1441 41,2640 0 0006 1 EXTEND

1442 RFF 4 LAST 412 41,2641 3 2114 1 ECA LDDNNLOC

1443 RFF 7 LAST 418 41,2642 52 0006 0 DXCH Z SWITCH BANKS TO NOUN TABLE READING

1444 RFF 71 LAST 426 41,2643 3 4755 1 CAF ZERO ROUTINE.

1445 RFF 1 41,2644 0 3101 1 TC PUTCCM X COMF

1446 RFF 12 LAST 426 41,2645 50 145 1 INDEX NOUNADD

1447 41,2646 54 000 0 TS 0

1448 RFF 38 LAST 415 41,2647 3 4753 1 CAF CNE Y COMF

1449 RFF 2 LAST 427 41,2650 0 3101 1 TC PLTCCM

1450 RFF 13 LAST 427 41,2651 50 145 1 INDEX NOUNADD

1451 41,2652 54 001 1 TS 1

1452 RFF 25 LAST 427 41,2653 3 4752 0 CAF TWC Z COMF

1453 RFF 3 LAST 427 41,2654 0 3101 1 TC PUTCCM

1454 RFF 14 LAST 427 41,2655 50 145 1 INDEX NOUNADD

1455 41,2656 54 002 1 TS 2

1455C1 RFF 2 LAST 156 41,2657 4 4757 1 CS SEVEN IF NOUN 7 HAS JUST BEEN LOADED, SET

1455C2 RFF 10 LAST 412 41,2660 6 1001 1 AD NOUNREG FLAG BITS AS SPECIFIED.

1455C3 41,2661 0 1006 1 EXTEND

1455C4 41,2662 1 2664 0 RFF +2

1455C5 RFF 2 LAST 407 41,2663 3 3001 0 TC LOADLV

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145506	REF	4	LAST	417	41,2664	3 1002 1	CA	XREG	EACER OF FLAG WORD.
145507	REF	5	LAST	412	41,2665	0 4304 1	TC	SETNCAADR +1	SET FBANK, NCLNADD.
145508	REF	2	LAST	418	41,2666	3 1104 1	CA	ZREG	ZERO TO RESET BITS, NCLN-ZERO TO SET BITS
145509					41,2667	0 0004 0		INHINT	
14551					41,2670	0 0006 1		EXTEND	
145511	REF	1			41,2671	1 2700 0		EZF	BITSCFF
145512	REF	15	LAST	427	41,2672	50 145 1	INDEX	NCLNADD	
145513					41,2673	4 0000 0	CS	0	
145514	REF	1			41,2674	7 1003 1	MASK	YREG	EITS TO BE PROCESSED.
145515	REF	16	LAST	428	41,2675	50 145 1	INDEX	NCLNADD	
145516					41,2676	26 000 0	ADS	0	SFT BITS.
145517	REF	1			41,2677	0 2705 1	TC	BITSCFF1	
145518	REF	2	LAST	428	41,2700	4 1703 1	BITSOFF	CS	YREG
145519	REF	17	LAST	428	41,2701	50 145 1	INDEX	NCLNADD	
14552					41,2702	7 0000 0	MASK	0	
145521	REF	18	LAST	428	41,2703	50 145 1	INDEX	NCLNADD	
145522					41,2704	54 000 0	TS	0	RESFT EITS.
145523					41,2705	0 0002 1	BITSOFF1	RELINT	
1456	REF	3	LAST	427	41,2706	0 3001 0	TC	LOADLV	
1457	REF	39	LAST	427	41,2707	4 4753 0	ARLOAD	CS	ONE
1458	REF	4	LAST	427	41,2710	0 2426 0	TC	COMPTST	
1459	REF	2	LAST	427	41,2711	0 2462 0	TC	NCUNTEST	TEST IF NOUN CAN BE LOADED.
1460	REF	2	LAST	427	41,2712	3 3012 1	CAF	VBSP1LD	
1461	REF	5	LAST	427	41,2713	0 2341 0	TC	UPDATVB -1	
1462	REF	2	LAST	427	41,2714	0 2305 0	TC	REGDATX	
1463	REF	2	LAST	427	41,2715	3 3013 0	CAF	VBSP2LD	
1464	REF	6	LAST	426	41,2716	0 2341 0	TC	UPDATVB -1	
1465	REF	2	LAST	427	41,2717	0 2307 1	TC	REGDATY	
1466	REF	9	LAST	409	41,2720	4 4756 0	PUTXY	CS	FIVE
1467	REF	2	LAST	427	41,2721	0 3015 0	TC	ALLOD/OC	TEST THAT THE 2 DATA WORDS LOADED ARE ALL DEC OR ALL OCT.
1468					41,2722	0 0006 1	EXTEND		
1469	REF	5	LAST	427	41,2723	3 2114 1	CCA	LCDNNLOC	SWITCH BANKS TO NOUN TABLE READING
1470	REF	8	LAST	427	41,2724	52 006 0	EXCH	Z	ROUTINE.
1471	REF	72	LAST	427	41,2725	3 4755 1	CAF	ZERO	X COMF
1472	REF	4	LAST	427	41,2726	0 3101 1	TC	PUTCCM	
1473	REF	19	LAST	428	41,2727	50 145 1	INDEX	NCLNADD	
1474					41,2730	54 000 0	TS	0	
1475	REF	40	LAST	428	41,2731	3 4753 1	CAF	ONE	Y COMF
1476	REF	5	LAST	428	41,2732	0 2101 1	TC	PUTCCM	
1477	REF	20	LAST	428	41,2733	50 145 1	INDEX	NCLNADD	
1478					41,2734	54 001 1	TS	1	
1479	REF	4	LAST	428	41,2735	0 3001 0	TC	LOADLV	
1491	REF	3	LAST	428	41,2736	0 2305 0	ALCAD	TC	REGDATX
1482					41,2737	0 0006 1	EXTEND		
1483	REF	6	LAST	428	41,2740	3 2114 1	CCA	LCDNNLOC	SWITCH BANKS TO NOUN TABLE READING
1484	REF	9	LAST	428	41,2741	52 006 0	EXCH	Z	ROUTINE.
1485	REF	73	LAST	428	41,2742	3 4755 1	CAF	ZERO	X COMF
1486	REF	6	LAST	428	41,2743	0 3101 1	TC	PUTCCM	

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1487	REF	21	LAST	428	41,2744	50 145 1		INDEX	NCLNADD	
1488					41,2745	54 000 0		TS	0	
1489	REF	5	LAST	428	41,2746	0 3001 0		TC	LCADLV	
1490	REF	41	LAST	428	41,2747	4 4753 0	BLCAD	CS	ONE	
1491	REF	5	LAST	428	41,2750	0 2426 0		TC	CCMPTEST	
1493	REF	24	LAST	420	41,2751	3 4735 1		CAF	BIT15	SET CLPASS FOR PASS0 ONLY
1494	REF	10	LAST	408	41,2752	55 014 1		TS	CLPASS	
1495	REF	3	LAST	428	41,2753	0 2307 1		TC	REGDATY	
1496					41,2754	0 0006 1		EXTEND		
1497	REF	7	LAST	428	41,2755	3 2114 1		CCA	LCDNALOC	SWITCH BANKS TO NCUN TABLE READING
1498	REF	10	LAST	428	41,2756	52 006 0		CXCH	Z	PCUTINE.
1499	REF	42	LAST	429	41,2757	3 4753 1		CAF	ONE	
1500	REF	7	LAST	428	41,2760	0 3101 1		TC	PUTCCM	
1501	REF	22	LAST	429	41,2761	50 145 1		INDEX	NCLNADD	
1502					41,2762	54 001 1		TS	1	
1503	REF	6	LAST	429	41,2763	0 3001 0		TC	LCADLV	
1504	REF	26	LAST	427	41,2764	4 4752 1	CLOAD	CS	TWO	
1505	REF	6	LAST	429	41,2765	0 2426 0		TC	CCMPTEST	
1507	REF	25	LAST	429	41,2766	3 4735 1		CAF	BIT15	SET CLPASS FOR PASS0 ONLY
1508	REF	11	LAST	429	41,2767	55 014 1		TS	CLPASS	
1509	REF	3	LAST	427	41,2770	0 2311 0		TC	REGDATZ	
1510					41,2771	0 0006 1		EXTEND		
1511	REF	8	LAST	429	41,2772	3 2114 1		CCA	LCDNALOC	SWITCH BANKS TO NCUN TABLE READING
1512	REF	11	LAST	429	41,2773	52 006 0		EXCH	Z	PCUTINE.
1513	REF	27	LAST	429	41,2774	3 4752 0		CAF	TWO	
1514	REF	8	LAST	429	41,2775	0 3101 1		TC	PUTCCM	
1515	REF	23	LAST	429	41,2776	50 145 1		INDEX	NCUNADD	
1516					41,2777	54 002 1		TS	2	
1517	REF	7	LAST	429	41,3000	0 3001 0		TC	LCADLV	
1518	REF	74	LAST	428	41,3001	3 4755 1	LCADLV	CAF	ZERO	
1519	REF	13	LAST	408	41,3002	54 777 1		TS	DECBRNCH	
1520	REF	75	LAST	429	41,3003	4 4755 0		CS	ZERO	
1521	REF	1			41,3004	55 012 0		TS	LCADSTAT	
1521.5	REF	5	LAST	409	41,3005	0 4457 0		TC	RELDSP	RELEASE FOR PRIORITY DISPLAY PROBLEM.
1522	REF	6	LAST	412	41,3006	4 4360 1		CS	VD1	TC BLOCK NUMERICAL CHARACTERS AND
1523	REF	37	LAST	426	41,3007	54 776 0		TS	DSPCCUNT	CLEAR AFTER A COMPLETED LOAD
1524	REF	24	LAST	425	41,3010	0 4635 0		TC	PCSTJUMP	AFTER COMPLETED LOAD, GO TO RECALTST
1525	REF	1			41,3011	61612 0		CADR	RECALTST	TO SEE IF THERE IS RECALL FROM ENCODE.
1526					41,3012	00025 0	VESP1LC	DEC	21	VB21 = ALCAD
1527					41,3013	00026 0	VESP2LC	DEC	22	VB22 = BLOAD
1528					41,3014	00027 1	VESP3LC	DEC	23	VB23 = CLCAD
1529	REF	13	LAST	424	41,3015	54 117 1	ALLDEC/CC	TS	DECCOUNT	TESTS THAT DATA WORDS LOADED ARE EITHER
1530	REF	14	LAST	425	41,3016	4 0777 1		CS	DECBRNCH	ALL DEC OR ALL OCT. ALARMS IF NOT.
1531	REF	3	LAST	406	41,3017	54 021 0		TS	SR	

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1532	REF	4	LAST	429	41,3020	4 0021 0	CS	SR		
1533	REF	5	LAST	430	41,3021	4 0021 0	CS	SR	SHIFTED RIGHT 2	
1534	REF	132	LAST	424	41,3022	10 000 0	CCS	A	DEC CCMR BITS IN LOW 3	
1535					41,3023	1 3025 1	TCF	+2	SCME CNFS IN LOW 3	
1536	REF	85	LAST	425	41,3024	0 0002 0	TC	Q	ALL ZEROS. ALL CCTL. CK	
1537	REF	14	LAST	429	41,3025	6 0117 0	AD	DECCOUNT	DEC CCMF = 7 FOR 3CCMP, =6 FOR 2CCMF	
1538					41,3026	0 0006 1	EXTEND		(BUT IT HAS BEEN DECREMENTED BY CCS)	
1539					41,3027	1 3031 1	BZF	+2	MUST MATCH 6 FOR 3CCMP, 5 FOR 2CCMF.	
1540	REF	4	LAST	416	41,3030	0 4145 0	TC	ALMCYCLE	ALARM AND RECYCLE.	
1541	REF	86	LAST	430	41,3031	0 0002 0	GOQ	TC	Q	ALL REQUIRED ARE DEC. CK
1542	REF	87	LAST	430	41,3032	56 002 0	SFRUTNCR	XCH	Q	GETS SF ROUTINE NUMBER FOR NORMAL CASE
1543	REF	1			41,3033	54 114 1	TS	EXITEM		CANT USE L FOR RETURN. TSTFORCP USES L.
1544	REF	1			41,3034	3 4347 0	CAF	MID5		
1545	REF	3	LAST	417	41,3035	7 0147 1	MASK	NNTYPTM		
1546	REF	1			41,3036	0 4322 0	TC	RIGHT5		
1547	REF	2	LAST	430	41,3037	0 0114 0	TC	EXITEM		SF ROUTINE NUMBER IN A
1548	REF	88	LAST	430	41,3040	56 002 0	SFRUTMIX	XCH	Q	GETS SF ROUTINE NUMBER FOR MIXED CASE
1549	REF	3	LAST	430	41,3041	54 114 1	TS	EXITEM		
1550	REF	15	LAST	430	41,3042	50 117 0	INDEX	DECCOUNT		
1551	REF	1			41,3043	3 3072 1	CAF	DISPLACE		PUT TC CCG, TC RIGHT5, CR TC LEFT5 IN L
1552	REF	54	LAST	417	41,3044	54 001 1	TS	L		
1553	REF	16	LAST	430	41,3045	50 117 0	INDEX	DECCOUNT		
1554	REF	2	LAST	400	41,3046	3 4346 1	CAF	LCW5		LCW5, MID5, CR H15 IN A
1555	REF	2	LAST	305	41,3047	7 0153 1	MASK	RUTMXTEM		GET H15, MID5, CR LCW5 OF RUTMXTAB ENTRY
1556	REF	55	LAST	430	41,3050	50 001 0	INDEX	L		
1557					41,3051	0 0000 1	TC	0		
R1558	DO TC CCG(DECOUNT=0), DO TC RIGHT5(DECOUNT=1), DO TC LEFT5(DECOUNT=2).									
1559	REF	4	LAST	430	41,3052	0 0114 0	SFRET1	TC	EXITEM	SF ROUTINE NUMBER IN A
1560	REF	89	LAST	430	41,3053	56 002 0	SFCONLM	XCH	Q	GETS 2X(SF CONSTANT NUMBER)
1561	REF	5	LAST	430	41,3054	54 114 1	TS	EXITEM		
1562	REF	9	LAST	426	41,3055	50 140 1	INDEX	MIXBP		
1563					41,3056	0 3056 1	TC	+0		
1564	REF	1			41,3057	0 3075 0	TC	CONUMCR		NORMAL ACN
1565	REF	17	LAST	430	41,3060	50 117 0	INDEX	DECCOUNT		MIXED ACN
1566	REF	2	LAST	430	41,3061	3 3072 1	CAF	DISPLACE		
1567	REF	56	LAST	430	41,3062	54 001 1	TS	L		PUT TC CCG, TC RIGHT5, CR TC LEFT5 IN L
1568	REF	18	LAST	430	41,3063	50 117 0	INDEX	DECCOUNT		
1569	REF	3	LAST	430	41,3064	3 4346 1	CAF	LCW5		
1570	REF	4	LAST	430	41,3065	7 0147 1	MASK	NNTYPTM		
1571	REF	57	LAST	430	41,3066	50 001 0	INDEX	L		
1572					41,3067	0 0000 1	TC	0		
R1573	DO TC CCG(DECOUNT=0), DO TC RIGHT5(DECOUNT=1), DO TC LEFT5(DECOUNT=2).									
1574					41,3070	6 0000 1	SFRET	CCURLE		2X(SF CONSTANT NUMBER) IN A
1575	REF	6	LAST	430	41,3071	0 0114 0	TC	EXITEM		
1576	REF	1			41,3072	0 3031 0	DISPLACE	TC	GOQ	

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1577	REF	2	LAST	430	41,3073	0 4322 0	TC	RIGHT5	
1578	REF	3	LAST	417	41,3074	0 4331 1	TC	LEFT5	
1579	REF	4	LAST	430	41,3075	2 4346 1	CCNUMCR	CAF	LCW5
1580	REF	5	LAST	430	41,3076	7 0147 1		MASK	NTYPTM
1581					41,3077	6 0090 1		DCUBLE	
1582	REF	7	LAST	430	41,3100	0 0114 0	TC	EXITM	2X(SF (CONSTANT NUMBER) IN A
1583	REF	19	LAST	430	41,3101	54 117 1	PUTCCM	TS	DECOUNT
1584	REF	50	LAST	430	41,3102	56 002 0		XCF	C
1585	REF	1			41,3103	54 115 0		TS	DFCRET
1586	REF	76	LAST	429	41,3104	3 4755 1		CAF	ZERO
1587	REF	3	LAST	421	41,3105	54 162 0		TS	MFAC+6
1588	REF	20	LAST	431	41,3106	50 117 0		INDEX	DECCUNT
1589	REF	3	LAST	406	41,3107	57 005 0		XCF	XREGLP
1590	REF	142	LAST	426	41,3110	54 155 1		TS	MFAC +1
1591	REF	21	LAST	431	41,3111	50 117 0		INDEX	DECOLNT
1592	REF	5	LAST	428	41,3112	57 002 1		XCF	XREF
1593	REF	143	LAST	431	41,3113	54 154 0		TS	MPAC
1594	REF	10	LAST	430	41,3114	50 141 1		INDEX	MIXRR
1595					41,3115	0 3115 1		TC	+0
1596	REF	1			41,3116	0 3143 1		TC	PLTNCRM
R1597	IF MIXNCUN, PLACE ADDRESS FOR COMPONENT K INTO NCUNADD, SET EBANK BITS.								NORMAL NCUN
1598	REF	22	LAST	431	41,3117	50 117 0		INDEX	DECCUNT
1599	REF	4	LAST	422	41,3120	3 0150 0		CA	LOADITEM
1600	REF	5	LAST	422	41,3121	7 4356 1		MASK	LCW11
1601	REF	6	LAST	428	41,3122	0 4303 0		TC	SETNCADR
1602					41,3123	0 0006 1		EXTEND	
1603	REF	23	LAST	431	41,3124	60 117 0		SL	DECCUNT
1604	REF	24	LAST	429	41,3125	54 145 0		TS	NCUNADD
1605	REF	15	LAST	429	41,3126	10 777 1		CCS	DECBPACH
1606	REF	1			41,3127	0 2200 0		TC	PLTDECSF
1607	REF	1			41,3130	0 2454 0		TC	DCTSTCYC
1608	REF	3	LAST	418	41,3131	0 3040 0		TC	SFRUTMIX
1609	REF	3	LAST	417	41,3132	0 2261 0		TC	DPTST
1610	REF	1			41,3133	0 3161 1		TC	PUTCOM2
A1611									NO DP
A1612									TEST FOR DP SCALE FOR CCT LOAD. IF SO,
A1613									+0 INTO MAJOR PART. SET NCUNADD FOR
1614	REF	25	LAST	431	41,3134	24 145 1	PLTDPCCM	INCR	NCUNADD
1615	REF	26	LAST	431	41,3135	3 0145 1		CA	NCUNADD
1616	REF	24	LAST	431	41,3136	26 117 1		ACS	DECCUNT
1617	REF	77	LAST	431	41,3137	3 4755 1		CAF	ZERO
1618	REF	25	LAST	431	41,3140	50 117 0		INDEX	DECCUNT
1619					41,3141	52 777 0		TS	0
1620	REF	2	LAST	431	41,3142	0 3161 1		TC	PLTCCM2
1621	REF	2	LAST	408	41,3143	0 4311 0	PLTNCRM	TC	SETNADD
1622	REF	16	LAST	431	41,3144	10 777 1		CCS	DECBPACH
									ECADR FROM NCUNADR. SETS EB, NCUNADD.

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1623	REF	2	LAST	431	41,3145	0 3200 0	TC	PUTDECSF	+ DEC
1624	REF	2	LAST	431	41,3146	0 2454 0	TC	DCTSTCYC	+0 COTAL
1625	REF	3	LAST	418	41,3147	0 3032 0	TC	SFRUTNOR	TEST IF DEC ONLY BIT = 1. IF SC,
1626	REF	4	LAST	431	41,3150	0 2261 0	TC	DPTEST	ALARM AND RECYCLE. IF ACT, CONTINUE.
1627	REF	3	LAST	431	41,3151	0 3155 0	TC	PLTCCM2 -4	NC DP
1628	REF	78	LAST	431	41,3152	3 4755 1	CAF	ZERO	CP
1629	REF	26	LAST	431	41,3153	54 117 1	TS	DECCUNT	
1630	REF	1			41,3154	0 3134 1	TC	PLTDCOM	
1631	REF	8	LAST	417	41,3155	3 0146 1	CA	NNACTEM	
1632	REF	43	LAST	429	41,3156	6 4753 1	AD	CNE	IF NNACTEM = -1, CHANNEL TO BE SPECIFIED
1633					41,3157	0 0006 1	EXTEND		
1634	REF	1			41,3160	1 3165 1	BZF	CHANLCAD	
1635	REF	144	LAST	431	41,3161	56 154 1	PLTCCM2 XCH	MFAC	
1636	REF	2	LAST	431	41,3162	0 0115 1	TC	DECRET	
1637	REF	28	LAST	429	0776		EBANK=	DSPCCUNT	
1638	REF	1			41,3163	02147 1	GTSFINLC 2CADR	GTSFIN	
1639	REF	1			41,3164	64101 0			
1639	REF	3	LAST	427	41,3165	4 4757 1	CHANLCAD CS	SEVEN	CCNT LCAD CHAR 7. (IT = SUPERBANK).
16391	REF	4	LAST	417	41,3166	6 1016 1	AC	NCUNCADR	
16392					41,3167	0 0006 1	EXTEND		
16393	REF	8	LAST	429	41,3170	1 3001 1	BZF	LCADLV	
16394	REF	5	LAST	432	41,3171	3 1016 1	CA	NCUNCADR	
1640	REF	7	LAST	417	41,3172	7 5004 1	MASK	LCW9	
1641	REF	145	LAST	432	41,3173	56 154 1	XCH	MPAC	
16411					41,3174	0 0006 1	EXTEND		
16412	REF	146	LAST	432	41,3175	5 0154 1	INDEX	MFAC	
1642					41,3176	01 000 0	WRITE	0	
1643	REF	9	LAST	432	41,3177	0 3001 0	TC	LCADLV	

R1644 PUTDECSF FINDS MIXBP AND DECCUNT STILL SET FROM PLTCCM

1645	REF	2	LAST	417	41,3200	0 3053 1	PUTDECSF TC	SFCENUM	2X(SF CON NUMB) IN A
1646	REF	14	LAST	421	41,3201	54 123 0	TS	SFTFMP1	
1647					41,3202	0 0006 1	EXTEND		SWITCH BANKS TO SF CONSTANT TABLE
1648	REF	1			41,3203	3 3164 1	DCA	GTSFINLC	READING ROUTINE.
1649	REF	12	LAST	429	41,3204	52 006 0	DXCH	Z	LCADS SFTFMP1, SFTFMP2.
1650	REF	11	LAST	431	41,3205	50 140 1	INDEX	MIXBP	
1651					41,3206	0 3206 0	TC	+0	
1652	REF	1			41,3207	0 3212 0	TC	PLTSFNOR	
1653	REF	4	LAST	431	41,3210	0 3040 0	TC	SFRUTMIX	
1654	REF	1			41,3211	0 3213 1	TC	PLTDCSF2	
1655	REF	4	LAST	432	41,3212	0 3032 0	PLTSFNOR TC	SFRUTNOR	
1656	REF	133	LAST	430	41,3213	50 000 1	PUTDCSF2 INDEX	A	
1657	REF	1			41,3214	3 3216 1	CAF	SFINTABR	

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1658	REF	4	LAST	418	41,3215	0 4640	1	TC	BANKJUMP	SWITCH BANKS FOR EXPANSION ROOM
1659	REF	1			41,3216	62352	1	SFINTABR	GCALMCYC	ALARM AND RECYCLE IF DEC LOAC
A1660										WITH CCTAL ONLY ACUN.
1661	REF	1			41,3217	61142	1	CADR	BIARCUND	
1662	REF	1			41,3220	61044	0	CADR	DEGINSE	
1663	REF	1			41,3221	61132	0	CADR	ARTHINSE	
1664	REF	1			41,3222	61150	1	CADR	DPINSE	
1665	REF	1			41,3223	61175	0	CADR	DPINSE2	
1666	REF	4	LAST	426	41,3224	61454	0	CADR	DSPALARM	LPDSCUT CANT BE LOADED.
1667	REF	2	LAST	433	41,3225	61150	1	CADR	DPINSE	SAME AS ARITHFPI
1668	REF	1			41,3226	65452	1	CADR	FMSIN	
1669	REF	5	LAST	433	41,3227	61454	0	CADR	DSPALARM	MIN/SEC CANT BE LOADED.
1671	REF	1			41,3230	61202	0	CADR	DPINSE4	
16711	REF	1			41,3231	61145	0	CADR	ARTINISE	
16712	REF	6	LAST	433	41,3232	61454	0	CADR	DSPALARM	2INTOUT CANT BE LOADED.
16714	REF	2	LAST	433	41,3233	61044	0	CADR	DEGINSE	TESTS AT END FOR 360-CCU
16715	REF	7	LAST	433	41,3234	61454	0	CADR	DSPALARM	RPANGCUT CANT BE LOADED.
16716	REF	8	LAST	433	41,3235	61454	0	CADR	DSPALARM	RRECTCUT CANT BE LOADED.
1672					41,3236					ENDPUTIN EQUALS

R1673 SCALE FACTORS FOR THOSE ROUTINES NEEDING THEM ARE AVAILABLE IN SETEMPL.

R1674 ALL SFIN ROUTINES USE MPAC MPAC+1. LEAVE RESULT IN A. END WITH TC DECRET

1675 REF 1 40,3144 SETLCC FACDPDEC +1

16755 REF 4 LAST 426 TO 427: 15 485* CCUNT* \$\$/PIN

R1676 DEGINSE APPLIES $1000/180 = 5.5555(10) = 5.43434(8)$

1677	REF	7	LAST	426	40,3044	0 7106	1	DEGINSE	TC	CMF	SF ROUTINE FOR DEC DEGREES
1678	REF	1			40,3045	0 2130	0	ADPRES	DEGCCN1	MLT BY 5.5 5(10)X2EXP-3	
1679	REF	147	LAST	432	40,3046	10 155	1	CCS	MPAC	+1	THIS ROUNDS OFF MPAC+1 BEFORE SHIFT
1680	REF	19	LAST	404	40,3047	3 4741	1	CAF	BIT11		LEFT 3, AND CAUSES 360.00 TO OF/UF
1681					40,3050	0 3052	0	TC	+2		WHEN SHIFTED LEFT AND ALARM.
1682	REF	20	LAST	433	40,3051	4 4741	0	CS	BIT11		
1683	REF	148	LAST	432	40,3052	6 0155	0	AD	MPAC	+1	
1684	REF	1			40,3053	0 3221	0	TC	2ROUND	+2	
1685	REF	3	LAST	425	40,3054	0 4404	0	TC	TPSL1		LEFT 1
1686	REF	4	LAST	432	40,3055	0 4404	0	DEGINSE2	TC	TPSL1	LEFT 2
1687	REF	1			40,3056	0 3230	0	TC	TESTOFUF		
1688	REF	5	LAST	433	40,3057	0 4404	0	TC	TPSL1		RETURNS IF NO CF/UF (LEFT2)
1689	REF	149	LAST	433	40,3060	10 154	0	CCS	MPAC		
1690	REF	1			40,3061	0 3065	1	TC	SIGNFIX		IF+, CC TO SIGNFIX
1691	REF	2	LAST	432	40,3062	0 3065	1	TC	SIGNFIX		IF +0, CC TO SIGNFIX
1692					40,3063	4 0000	0	CCM			IF -, USE -MAGNITUDE +1
1693	REF	150	LAST	433	40,3064	54 154	0	TS	MPAC		IF -0, USE +0
1694	REF	4	LAST	431	40,3065	10 162	0	SIGNFIX	CCS	MPAC+6	
1695	REF	1			40,3066	0 3124	0	TC	SCNCT1		IF OVERFLOW
1696	REF	1			40,3067	0 3077	1	TC	ENDSCALE		NO CVERFLOW/UNCERFLOW

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1697	REF	151	LAST	432	40,3070	10 154 0	CCS	MPAC	IF CF FORCE SIGN TO C EXCEPT -180
1698	REF	5	LAST	416	40,3071	0 5675 0	TC	CCSHCLF	
1699	REF	1			40,3072	0 3122 0	TC	NEG180	
1700					40,3073	0 3074 1	TC	+1	
1701	REF	152	LAST	434	40,3074	56 154 1	XCF	MPAC	
1702	REF	8	LAST	420	40,3075	7 4733 0	MASK	POS MAX	
1703	REF	153	LAST	434	40,3076	54 154 0	TS	MPAC	
1704	REF	12	LAST	432	40,3077	50 140 1	ENDSCALE	INDEX	IF ROUTINE NO. IS NOT CPU DEGREES,
170405					40,3100	0 3100 0	TC	+0	THEN THIS IS 360 - CPU DEGREES
17041					40,3101	0 3104 1	TC	+3	AND ANGLE IN MPAC MUST BE REPLACED
17042	REF	1			40,3112	0 3114 0	TC	SFMIXCAL	BY 360 DEGREES MINUS ITSELF.
17043					40,3103	0 3105 0	MIXBACK	TC	+2
17044	REF	1			40,3104	0 3117 0	TC	SFNCPCAL	
1705	REF	134	LAST	432	40,3105	4 0000 0	NCRBACK	CS	A
17051	REF	24	LAST	284	40,3106	6 4752 0	AD	BIT2	
17052					40,3107	0 0006 1	EXTEND		
17053					40,3110	1 3112 1	BZF	+2	
17054	REF	2	LAST	419	40,3111	0 2625 1	TC	360-CPU	
17055	REF	25	LAST	429	40,3112	0 4635 0	ENDSCALE1	TC	POSTJUMP
17056	REF	4	LAST	432	40,3113	63161 1	CADR	PUTCCM2	
17057	REF	89	LAST	425	40,3114	0 4616 1	SFMIXCAL	TC	BANKCALL
17058	REF	5	LAST	432	40,3115	63040 0	CADR	SFRUTMIX	
17059	REF	1			40,3116	0 3103 0	TC	MIXPACK	
170591	REF	90	LAST	434	40,3117	0 4616 1	SFNCRCAL	TC	BANKCALL
170592	REF	5	LAST	432	40,3120	63032 0	CADR	SFRUTADR	
170593	REF	1			40,3121	0 3105 0	TC	NCRBACK	
1706	REF	9	LAST	434	40,3122	4 4733 0	NEG180	CS	POS MAX
1707	REF	2	LAST	423	40,3123	0 3076 0	TC	ENDSCALE	-1
1708	REF	154	LAST	434	40,3124	4 0154 0	SGNTC1	CS	MPAC
1709	REF	10	LAST	434	40,3125	7 4733 0	MASK	POS MAX	IF CF FORCE SIGN TO 1
1710	REF	135	LAST	434	40,3126	4 0000 0	CS	A	
1711	REF	3	LAST	434	40,3127	0 3076 0	TC	ENDSCALE	-1
1712					40,3130	26161 0	DEGCON1	2DEC	5.555555555 P-3
1712					40,3131	30707 1			
1715	REF	8	LAST	432	40,3132	0 7106 1	APTHINSF	TC	DMP
1716	REF	15	LAST	432	40,3133	00123 1	ADRES	SFTEMP1	SCALES MPAC, +1 BY SFTEMP1, SFTEMP2.
1717	REF	155	LAST	434	40,3134	56 156 0	XCF	MPAC	ASSUMES POINT BETWEEN HI AND LO PARTS
1718	REF	156	LAST	434	40,3135	56 155 0	XCF	MPAC	CF SFCON. SHIFTS RESULTS LEFT BY 14.
1719	REF	157	LAST	434	40,3136	56 154 1	XCF	MPAC	(BY TAKING RESULTS FROM MPAC+1, MPAC+2)
1720					40,3137	0 0006 1	EXTEND		
1721	REF	2	LAST	433	40,3140	1 3142 1	BZF	BINROUND	
1722	REF	5	LAST	430	40,3141	0 4145 0	TC	ALMCYCLE	TCC LARGE A LOAD. ALARM AND RECYCLE.
1723	REF	2	LAST	432	40,3142	0 3217 0	BINROUND	TC	2RCUND
1724	REF	2	LAST	432	40,3143	0 3230 0	TC	TFSTCFUF	

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1725	REF	1		40,3144	0 3112 0		TC	ENDSCALE	RETURNS IF NO CF/CF	
17251	REF	9	LAST	434	40,3145	0 7106 1	ARTINISF	TC	DMP	SCALES MPAC, +1 BY SFTMP1, SFTMP2.
17252	REF	16	LAST	434	40,3146	00123 1		ADRES	SFTMP1	ROUNDS MPAC+1 INTO MPAC.
17253	REF	3	LAST	434	40,3147	0 3142 0		TC	BINRCEND	
1739	REF	10	LAST	435	40,3150	0 7106 1	DPINSE	TC	DMP	SCALES MPAC, MPAC +1 BY SFTMP1,
1740	REF	17	LAST	435	40,3151	00123 1		ADRES	SFTMP1	SFTMP2. STORES LOW PART OF RESULT
1741	REF	158	LAST	434	40,3152	56 156 0		XCF	MPAC +2	IN (E SUBK) +1 CR E+1
1742					40,3153	6 0000 1		CCUBLE		
1743	REF	159	LAST	435	40,3154	54 156 1		TS	MPAC +2	
1744	REF	79	LAST	432	40,3155	3 4755 1		CAF	ZERO	
1745	REF	161	LAST	435	40,3156	6 0155 0		AD	MPAC +1	
1746	REF	3	LAST	434	40,3157	0 3221 0		TC	2ROUND +2	
1747	REF	2	LAST	434	40,3160	0 2230 0		TC	TESTCFUF	
1748	REF	13	LAST	434	40,3161	50 140 1		INDEX	MIXBR	RETURNS IF NO CF/CF
1749					40,3162	0 3162 1		TC	+0	
1750	REF	1			40,3163	0 3173 1		TC	DFINCFM	
1751	REF	27	LAST	432	40,3164	2 0117 0		CA	DFCOUNT	MIXEDNCLN
1752	REF	27	LAST	431	40,3165	6 0145 1	DPINCCM	AD	NCUNADO	MIXED
1753	REF	91	LAST	431	40,3166	54 002 1		TS	Q	F SLEK
1754	REF	161	LAST	435	40,3167	56 155 1		XCF	MPAC +1	E
1755	REF	92	LAST	435	40,3170	50 002 0		INDEX	G	
1756					40,3171	54 001 1		TS	1	PLACE LOW PART IN
1757	REF	2	LAST	435	40,3172	0 3112 0		TC	ENDSCALE	(E SUBK) +1 MIXED
1758	REF	80	LAST	435	40,3173	3 4755 1	DFINCFM	CAF	ZERO	E +1
1759	REF	1			40,3174	0 3165 0		TC	DPINCCM	NORMAL
1760	REF	11	LAST	435	40,3175	0 7106 1	DPINSE2	TC	DMP	ASSUMES PCINT BETWEEN BITS 7-8 OF HIGH
1761	REF	18	LAST	435	40,3176	00123 1		ADRES	SFTMP1	PART OF SF CONST. DPINSE2 SHIFTS RESULTS
1762	REF	13	LAST	427	40,3177	3 6245 1		CAF	SIX	LEFT BY 7, ROUNDS MPAC+2 INTO MPAC+1
1763	REF	2	LAST	421	40,3200	0 3207 1		TC	TFLEFTN	SHIFT LEFT 7.
1764	REF	3	LAST	433	40,3201	0 3152 1		TC	DPINSE +2	
1765	REF	12	LAST	435	40,3202	0 7106 1	DPINSE4	TC	DMP	ASSUMES PCINT BETWEEN BITS 11-12 OF HIGH
1766	REF	19	LAST	435	40,3203	00123 1		ADRES	SFTMP1	PART OF SF CONST. DPINSE2 SHIFTS RESULTS
1767	REF	28	LAST	429	40,3204	3 4752 0		CAF	TWO	LEFT BY 3, ROUNDS MPAC+2 INTO MPAC+1.
1768	REF	3	LAST	435	40,3205	0 3207 1		TC	TFLEFTN	SHIFT LEFT 3.
1769	REF	4	LAST	435	40,3206	0 3152 1		TC	DPINSE +2	
1770	REF	93	LAST	435	40,3207	56 002 0	TFLEFTN	XCF	G	SHIFTS MPAC, +1, +2 LEFT N. SETS OVFLG
1771	REF	1			40,3210	54 124 1		TS	SFTMP2	TC +1 FOR CF, -1 FOR UF.
1772	REF	94	LAST	435	40,3211	56 002 0		XCF	Q	CALL WITH N-1 IN A.
1773	REF	20	LAST	435	40,3212	54 123 0	LEFTACCM	TS	SFTMP1	LCCP TIME .37 MSEC.
1774	REF	6	LAST	433	40,3213	0 4404 0		TC	TPSL1	

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1775	REF	21	LAST	435	40,3214	10 123 0	CCS	SFTMP1	
1776	REF	1			40,3215	0 3212 0	TC	LEFTNCCN	
1777	REF	2	LAST	435	40,3216	0 0124 0	TC	SFTMP2	
1778	REF	162	LAST	435	40,3217	56 155 0	2RCUNC	XCH	MPAC +1
1779					40,3220	6 0010 1	DOUBLE		
1780	REF	163	LAST	436	40,3221	54 155 1	TS	MPAC	+1
1781	REF	95	LAST	435	40,3222	0 0002 0	TC	Q	IF MPAC+1 CCES NCT CF/CF
1782	REF	164	LAST	436	40,3223	6 0154 1	AD	MPAC	
1783	REF	165	LAST	436	40,3224	54 154 0	TS	MPAC	
1784	REF	96	LAST	436	40,3225	0 0002 0	TC	Q	IF MPAC CCES NCT CF/CF
1785	REF	5	LAST	435	40,3226	54 162 0	TS	MPAC+6	
1786	REF	97	LAST	436	40,3227	0 0002 0	2RADEND	TC	C
1787	REF	6	LAST	436	40,3230	10 162 0	TESTOFUF	CCS	MPAC+6
1788	REF	6	LAST	434	40,3231	0 4145 0	TC	ALMCYCLE	RETURNS IF NO CF/CF
1789	REF	98	LAST	436	40,3232	0 0002 0	TC	Q	CF ALARM AND RECYCLE.
1790	REF	7	LAST	436	40,3233	0 4145 0	TC	ALMCYCLE	UF ALARM AND RECYCLE.
1791	REF	1			42,3452		SFTLCC	ENDSPMIN	+1
17915	REF	2	LAST	422	TC	426: 146 146*	COUNT*	\$\$/PIN	
1792	REF	1			42,3452	0 3573 0	HMSIN	TC	ALL3DEC
1793	REF	13	LAST	435	42,3452	0 7116 1	TC	DNP	IF ALL 3 WORDS WERE NOT LOADED, ALARM.
1794	REF	1			42,3454	0 0353 0	ADRES	WFOLECON	XREG, XREGLP (=FCURS) WERE ALREADY PUT
1795	REF	1			42,3455	0 3543 0	TC	RND/TST	INTC MPAC, MPAC+1.
1796	REF	81	LAST	435	42,3456	3 4755 1	CAF	ZERO	ROUND OFF TC WHOLE PHS IN MPAC+1.
1797	REF	166	LAST	436	42,3457	54 156 1	TS	MPAC	ALARM IF MPAC NON ZERO (G/ 16383).
1798	REF	1			42,3460	3 3536 1	CAF	HRCOIN	
1799	REF	167	LAST	436	42,3461	54 154 0	TS	MPAC	
1800	REF	2	LAST	436	42,3462	3 3537 0	CAF	HRCOIN	+1
1801	REF	168	LAST	436	42,3463	56 155 0	XCH	MPAC	+1
1802	REF	4	LAST	424	42,3464	0 7212 0	TC	SFOPTMP	
1803	REF	1			42,3465	0 3554 0	TC	MPACTST	ALARM IF MPAC NON ZERO (G/ 745)
1804	REF	169	LAST	436	42,3466	52 156 1	EXCH	MPAC	+1
1805	REF	1			42,3467	52 124 1	EXCH	HITEMIN	STORE FCURS CONTRIBUTION
1806	REF	3	LAST	428	42,3470	2 1003 0	CA	YREG	PUT YREG, YREGLP INTO MPAC, +1.
1807	REF	2	LAST	101	42,3471	23 0016 0	LXCH	YREGLP	
1808	REF	170	LAST	436	42,3472	52 155 1	EXCH	MPAC	
1809	REF	14	LAST	436	42,3473	0 7106 1	TC	DNP	
1810	REF	2	LAST	436	42,3474	0 0353 0	ADRES	WFOLECON	
1811	REF	2	LAST	436	42,3475	0 3543 0	TC	RND/TST	ROUND OFF TC WHOLE MIN IN MPAC+1
1812	REF	1			42,3476	4 3541 0	CS	59MIN	ALARM IF MPAC NON ZERO (G/16383)
1813	REF	1			42,3477	0 3561 0	TC	S17TST	ALARM IF MPAC+1 G/ 59MIN
1814	REF	171	LAST	436	42,3500	56 155 0	XCH	MPAC	+1
1815					42,3501	0 0006 1	EXTEND		
1816	REF	1			42,3502	7 3540 1	MP	MINCCN	LEAVES MINUTES CONTRIBUTION IN A,L

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1817	REF	2	LAST	436	42,3513	20 124 1	DAS	HITEMIN	ADD IN MINUTES CONTRIBUTION
1818					42,3514	0 0006 1	EXTEND		IF THIS DAS OVERFLOWS, G/ 745HR, 39MIN
1819					42,3515	1 3507 1	EZF	+2	
1820	REF	8	LAST	436	42,3516	0 4145 0	TC	ALMCYCLE	
1821	REF	3	LAST	428	42,3517	3 1024 1	CA	ZREG	FUT ZREC, ZRECLP INTO MPAC, +1.
1822	REF	2	LAST	101	42,3510	22 2007 1	LXCH	ZREGLP	
1823	REF	172	LAST	436	42,3511	52 155 1	EXCH	MPAC	
1824	REF	15	LAST	436	42,3512	0 7106 1	TC	DMP	
1825	REF	3	LAST	436	42,3513	13534 0	ADRES	WHOLECON	
1826	REF	2	LAST	436	42,3514	0 3543 0	TC	RND/TST	ROUND OFF TC WHOLE CENTI-SEC IN MPAC+1
1827	REF	1			42,3515	4 3542 0	CS	59.99SEC	ALARM IF MPAC NON ZERO (G/163.83 SEC)
1828	REF	2	LAST	436	42,3516	0 3561 0	TC	SIZETST	ALARM IF MPAC+1 G/59.99 SEC
1829	REF	2	LAST	437	42,3517	52 124 1	EXCH	HITEMIN	ADD IN SECONDS CONTRIBUTION
1830	REF	173	LAST	437	42,3520	20 155 1	DAS	MPAC	IF THIS DAS OVERFLOWS,
1831					42,3521	0 0006 1	EXTEND		G/ 745 HR, 39 MIN, 14.55 SEC.
1832					42,3522	1 3524 0	BZF	+2	
1833	REF	9	LAST	437	42,3523	0 4145 0	TC	ALMCYCLE	ALARM AND RECYCLE
1834	REF	92	LAST	436	42,3524	3 4755 1	CAF	ZERO	
1835	REF	174	LAST	437	42,3525	54 156 1	TS	MPAC +2	
1836	REF	6	LAST	426	42,3526	0 7262 0	TC	TPACREF	
1837	REF	175	LAST	437	42,3527	52 155 1	EXCH	MPAC	
1838	REF	28	LAST	435	42,3530	50 145 1	INDEX	NCLNADD	
1839					42,3531	52 001 1	EXCH	0	
1840	REF	26	LAST	434	42,3532	0 4635 0	TC	POSTJUMP	
1841	REF	10	LAST	432	42,3533	63001 0	CADR	LCADLV	
1842					42,3534	00006 1	WHOLECON	CCT	00006
1843					42,3535	03240 1		CCT	03240
1844					42,3536	00025 0	HPCON	OCT	00025
1845					42,3537	37100 1		CCT	37100
1846					42,3540	13560 0	MINCON	OCT	13560
1847					42,3541	00073 0	59MIN	OCT	00073
1848					42,3542	13557 1	59.99SEC	CCT	13557

1849	REF	176	LAST	437	42,3543	56 156 0	RND/TST	XCH	MPAC	+2	ROUNDS MPAC+2 INTO MPAC+1.
1850					42,3544	6 0000 1		DOUBLE			ALARMS IF MPAC NOT 0
1851	REF	177	LAST	437	42,3545	54 156 1	TS	MPAC	+2		
1852	REF	83	LAST	437	42,3546	3 4755 1	CAF	ZERO			
1853	REF	178	LAST	437	42,3547	6 0155 0	AC	MPAC	+1		
1854	REF	179	LAST	437	42,3550	54 155 1	TS	MPAC	+1		
1855	REF	84	LAST	437	42,3551	3 4755 1	CAF	ZERO			
1856	REF	180	LAST	437	42,3552	6 0154 1	AD	MPAC			CANT CRYFLOW
1857	REF	181	LAST	437	42,3553	56 154 1	XCH	MPAC			
1858	REF	182	LAST	437	42,3554	10 154 0	MPACTST	CCS	MPAC		ALARM IF MPAC NON ZERO
1859	REF	10	LAST	437	42,3555	0 4145 0	TC	ALMCYCLE			ALARM AND RECYCLE.
1860	REF	99	LAST	436	42,3556	0 0002 0	TC	0			
1861	REF	11	LAST	437	42,3557	0 4145 0	TC	ALMCYCLE			ALARM AND RECYCLE.
1862	REF	10	LAST	437	42,3560	0 0002 0	TC	0			

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1863	REF 183	LAST	437	42,3561	54 156 1	SIZEFST	TS	MFAC	+2	CALLED WITH - CCN IN A
1864	REF 184	LAST	438	42,3562	10 155 1		CCS	MFAC	+1	GET MAG OF MFAC+1
1865	REF 44	LAST	432	42,3563	6 4753 1		AD	ONE		
1866				42,3564	1 3566 0		TCF	+2		
1867	REF 45	LAST	438	42,3565	6 4753 1		AD	ONE		
1868	REF 185	LAST	438	42,3566	6 0156 0		AD	MFAC	+2	
1869				42,3567	0 0006 1		EXTEND			MAG OF MFAC+1 - CCN
1870				42,3570	6 3572 1		PZMF	+2		
1871	REF 12	LAST	437	42,3571	0 4145 0		TC	ALMCYCLE		MAG OF MFAC+1 G/ CON. ALARM AND RECYCLE.
1872	REF 101	LAST	437	42,3572	0 0002 0		TC	Q		MAG OF MFAC+1 L/= CCN

R1873 ALL3DEC TESTS THAT ALL 3 WORDS ARE LOADED IN DEC (FOR FMSIN).

R1874 ALARM IF NOT. (TEST THAT BITS 3,4,5 OF DECBRNCH ARE ALL = 1)

1875	REF 1			42,3573	4 3600 0	ALL3DEC	CS	OCT34BAR		GET BITS 3,4,5 IN A
1876	REF 17	LAST	431	42,3574	7 0777 1		MASK	DECBRNCH		GET BITS 3,4,5 OF DECBRNCH IN A
1877	REF 2	LAST	438	42,3575	6 3600 0		AD	OCT34BAR		BITS 3,4,5 OF DECBRNCH MUST ALL = 1
1878	REF 126	LAST	434	42,3576	10 000 0		CCS	A		
1879	REF 1			42,3577	0 3603 1		TC	FCPCV25		
1880				42,3600	77743 1	OCT34BAR	CCT	77743		
1881	REF 2	LAST	438	42,3601	0 3603 1		TC	FCPCV25		
1882	REF 102	LAST	438	42,3602	0 0002 0		TC	Q		

18825	REF 2	LAST	210	42,3603	4 6010 1	FCPCV25	CS	OCT31		FORCE VERB 25 TO BE EXECUTED BY RECYCLE
18826	REF 2	LAST	408	42,3604	55 040 0		TS	VERBSAVE		IN CASE OPERATOR EXECUTED A LOWER LOAD
18827	REF 13	LAST	438	42,3605	0 4145 0		TC	ALMCYCLE		VERB. ALARM AND RECYCLE.
1883				42,3606		ENDFMSS	EQUALS			

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R1884 MONITOR ALLOWS OTHER KEYBOARD ACTIVITY. IT IS ENDED BY VERB TERMINATE,
 R1885 VERB PROCEED WITHOUT DATA, VERB RESEQUENCE,
 R1886 ANOTHER MONITOR, OR ANY NVSUB CALL THAT PASSES THE DSPLOCK (PROVIDED
 R18861 THAT THE OPERATOR HAS SOMEHOW ALLOWED THE FACING OF A MONITOR WHICH
 R18862 HE HAS INITIATED THROUGH THE KEYBOARD).

R1887 MONITOR ACTION IS SUSPENDED, BUT NOT ENDED, BY ANY KEYBOARD ACTION,
 R1888 EXCEPT ERROR LIGHT RESET. IT BEGINS AGAIN WHEN KEY RELEASE IS PERFORMED.
 R1889 MONITOR SAVES THE NCUN AND APPROPRIATE DISPLAY VERB IN MONSAVE. IT SAVES
 R1890 NCUNADR IN MONSAVE1, IF NCUN = MACHINE CADR TO BE SPECIFIED. BIT 15 OF
 R1891 MONSAVE1 IS THE KILL MONITOR SIGNAL (KILLER BIT). BIT 14 OF MONSAVE1
 R18911 INDICATES THE CURRENT MONITOR WAS EXTERNALLY INITIATED (EXTERNAL
 R18912 MONITOR BIT). IT IS TURNED OFF BY RELOSP AND KILMONCN.

R1892 MONSAVE INDICATES IF MONITOR IS ON(+=ON, +=OFF)
 R1893 IF MONSAVE IS +, MONITOR ENTERS NO REQUEST, BUT TURNS KILLER BIT OFF.
 R1894 IF MONSAVE IS +0, MONITOR ENTERS REQUEST AND TURNS KILLER BIT OFF.

R1895 NVSUB (IF EXTERNAL MONITOR BIT IS OFF), VB=PROCEED WITHOUT DATA,
 R1896 VR=RESEQUENCE, AND VR=TERMINATE TURN KILL MONITOR BIT ON.

R1897 IF KILLER BIT IS ON, MONREQ ENTERS NO FURTHER REQUESTS, ZEROS MONSAVE
 R1898 AND MONSAVE1 (TURNING OFF KILLER BIT AND EXTERNAL MONITOR BIT).

R1899 MONITOR DOESNT TEST FOR MATBS SINCE NVSUB CAN HANDLE INTERNAL MATBS NOW
 1900 PFF 1 41,3236 SETLCC ENDP1111

19005	PFF	2	LAST	427	IC	433:	268	67C*	COUNT*	\$/PIN	
1901	PFF	1				41,3236	4	3245 0	MONITOR	CS	BIT15/14
1902	PFF	6	LAST	432		41,3237	7	1016 0		MASK	NCUNADR
1903	PFF	186	LAST	438		41,3240	54	155 1	MCNIT1	TS	MPAC +1
19031	PFF	7	LAST	426		41,3241	4	0136 1		CS	ENTEXT
19032	PFF	4	LAST	408		41,3242	6	4217 1		AD	ENDINST
19033	PFF	137	LAST	438		41,3243	10	000 0		CCS	A
19034	PFF	1				41,3244	0	3253 0		TC	MCNIT2
19035	PFF					41,3245	60000	1	BIT15/14	CCT	60000
19036	PFF	2	LAST	439		41,3246	0	2253 0		TC	MCNIT2
19037	PFF	38	LAST	416		41,3247	3	4736 1		CAF	BIT14
19038	PFF	187	LAST	439		41,3250	25	155 1		ADS	MPAC +1
190381	PFF	85	LAST	437		41,3251	2	4755 1		CAF	ZERC
190382	PFF	1				41,3252	55	021 1		TS	MONSAVE2
1904	PFF	3	LAST	233		41,3253	2	6077 1	MCNIT2	CAF	LCK7
1905	PFF	17	LAST	415		41,3254	7	1000 1		MASK	VERBREG
1906	PFF	4	LAST	431		41,3255	0	4331 1		TC	LEFIS
1907	PFF	5	LAST	401		41,3256	54	022 0		TS	CYL
1908	PFF	6	LAST	439		41,3257	4	0022 0		CS	CYL
1909	PFF	7	LAST	439		41,3260	56	022 1		XCH	CYL
1910	PFF	11	LAST	427		41,3261	6	1001 1		AD	NCUNREG
1911	PFF	188	LAST	439		41,3262	54	154 0		TS	MPAC
1912	PFF	86	LAST	439		41,3263	3	4755 1		CAF	ZERC

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1913	REF	3	LAST	399	41,3264	55'111 1	TS	DSPLCK	+0 INTO DSPLCK SC MONITOR CAN FLN.
1914	REF	4	LAST	408	41,3265	11'041 1	CCS	CADRSTOR	TURN OFF KR LITE IF CADRSTOR AND DSPLIST
1915					41,3266	0 3270 1	TC	+2	ARE BOTH EMPTY. (LITE COMES ON IF NEW
1916	REF	1			41,3267	0 4502 1	TC	RELDSE1	MONITOR IS KEYED IN OVER OLD MONITOR.)
1917					41,3270	0 0004 0	INHINT		
1918	REF	2	LAST	223	41,3271	11'017 1	CCS	MCONSAVE	
1919					41,3272	0 3277 0	TC	+5	IF MONSAVE WAS +, NO REQUEST
1920	REF	46	LAST	438	41,3273	3 4752 1	CAF	ONE	IF MONSAVE WAS 0, REQUEST MONREG
1921	REF	15	LAST	368	41,3274	0 5203 0	TC	WAITLIST	
1922	REF	39	LAST	432	0776		EBANK=	DSPOCCUNT	
1923	REF	1			41,3275	03303 1	2CADR	MCONREG	
1923	REF	1			41,3276	62101 0			
1924	REF	189	LAST	439	41,3277	52 155 1	EXCF	MFAC	PLACE MONITOR VERB AND NOUN INTO MONSAVE
1925	REF	3	LAST	440	41,3310	53'020 0	EXCF	MCONSAVE	ZERO THE KILL MONITOR BIT
1926					41,3311	0 0013 1	RELINT		SET UP EXTERNAL MONITOR BIT
1927	REF	4	LAST	407	41,3312	0 0136 0	TC	ENTRET	
1928	REF	1			41,3303	0 4401 1	MCONREG	TC	LCDSAMPT
1929	REF	2	LAST	223	41,3304	11'020 0	CCS	MCONSAVE1	CALLED BY WAITLIST
1930					41,3305	0 3311 1	TC	+4	TIME IS SNATCHED IN RUPT FOR NOUN 65
1931					41,3306	0 3311 1	TC	+2	IF KILLER BIT = 0, ENTER REQUESTS
1932	REF	1			41,3307	0 3322 1	TC	KILLMON	IF KILLER BIT = 0, ENTER REQUESTS
1933	REF	2	LAST	440	41,3310	0 3322 1	TC	KILLMON	IF KILLER BIT = 1, NO REQUESTS
1934	REF	1			41,3311	3 3326 0	CAF	MCONDEL	IF KILLER BIT = 1, NO REQUESTS
1935	REF	16	LAST	440	41,3312	0 5203 0	TC	WAITLIST	ENTER WAITLIST REQUEST FOR MONREG
1936	REF	40	LAST	440	0776		EBANK=	DSPOCCUNT	
1937	REF	2	LAST	440	41,3313	03303 1	2CADR	MCONREG	
1937					41,3314	62101 0			
1938	REF	2	LAST	155	41,3315	3 4355 0	CAF	CHPRIC	
1939	REF	5	LAST	329	41,3316	0 5072 1	TC	MCONVAC	ENTER EXEC REQUEST FOR MONDC
1940	REF	41	LAST	440	0776		EBANK=	DSPOCCUNT	
1941	REF	1			41,3317	03327 1	2CADR	MONDC	
1941	REF	1			41,3320	62101 0			
1942	REF	11	LAST	385	41,3321	0 5261 1	TC	TASKOVER	
1943	REF	87	LAST	439	41,3322	3 4755 1	KILLMON	CAF	ZFFC
1944	REF	4	LAST	440	41,3323	55'017 1	TS	MCONSAVE	ZERO MONSAVE AND TURN KILLER BIT OFF
1945	REF	3	LAST	440	41,3324	55'020 0	TS	MCONSAVE1	TURN OFF KILL MONITOR BIT.
1946	REF	12	LAST	440	41,3325	0 5261 1	TC	TASKOVER	TURN OFF EXTERNAL MONITOR BIT.
1947					41,3326	00144 0	MCONDEL	OCT	144 FOR 1 SEC MONITOR INTERVALS
1948	REF	4	LAST	440	41,3327	11'020 0	MONDC	CCS	MCONSAVE1
1949					41,3330	0 3334 0	TC	+4	CALLED BY EXEC
1950					41,3331	0 3334 0	TC	+2	IF KILLER BIT = 0, CONTINUE
1951	REF	48	LAST	415	41,3332	0 5155 0	TC	ENDOFJOB	IF KILLER BIT = 0, CONTINUE
1952	REF	49	LAST	440	41,3333	0 5155 0	TC	ENDOFJOB	IN CASE TERMINATE GAME SINCE LAST MONREG
1953	REF	4	LAST	440	41,3334	11'011 1	CCS	DSPLCK	IN CASE TERMINATE GAME SINCE LAST MONREG
1954	REF	1			41,3335	0 3357 0	TC	MCONLSY	NVSUB IS BUSY

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1955	REF	4	LAST	439	41,3336	3	6077	1	CAF	LCW7	
1956	REF	5	LAST	440	41,3337	7	1017	1	MASK	MCNSAVE	
1958	REF	1			41,3340	0	2321	0	TC	UPDATNN -1	PLACE NCLN INTO NCLNREG AND DISPLAY IT
1960	REF	1			41,3341	3	4144	1	CAF	MIC7	
1961	REF	6	LAST	441	41,3342	7	1017	1	MASK	MCNSAVE	CHANGE MONITOR VERB TO DISPLAY VERB
1962	REF	1			41,3343	6	3355	1	AF	MCNREF	-DEC10, STARTING IN BITE
1963	REF	1			41,3344	54	023	0	TS	ECCP	RIGHT 7
1964	REF	2	LAST	441	41,3345	3	023	0	CA	EDOP	
1965	REF	18	LAST	439	41,3346	55	100	1	TS	VERPREG	
1966	REF	1			41,3347	2	3356	1	CAF	MCNBACK	SET RETURN TO PASTEVE AFTER DATA DISPLAY
1967	REF	5	LAST	440	41,3350	54	136	1	TS	ENTRET	
1968	REF	2	LAST	439	41,3351	4	3245	0	CS	BIT15/14	
1969	REF	5	LAST	440	41,3352	7	1020	0	MASK	MCNSAVE1	PLT FCADR INTO MPAC +2. INTRCTES WILL
1970	REF	10	LAST	440	41,3353	54	156	1	TS	MPAC +2	DISPLAY IT AND SET NCLNFCADR, NCLNACC, EBANK.
1971	REF	1			41,3354	0	2046	1	ENDMONDC	TC	TESTAN

1972 4124 BLOCK 2

197201	REF	1			4111				SFTLCC	FFTACB	
197202					4124				BANK		

1972F	REF	1							COUNT*	\$4/PIN	
1973	REF	2	LAST	441	4124	3	4144	1	CAF	MID7	PASTEVB
1974	REF	2	LAST	439	4125	7	1021	1	MASK	MCNSAVE2	NVMONCPT PASTE OPTION
1975					4126	0	0006	1	EXTEND		
1976					4127	1	4131	1	BZF	+2	
1977	REF	1			4130	0	4132	0	TC	PASTFOPT	PASTE PLEASE VERB FOR NVMONCPT
1978	REF	7	LAST	441	4131	3	1017	0	CA	MCNSAVE	PASTE MONITOR VERB - PASTE OPTION IS 0
19782	REF	3	LAST	441	4132	54	023	1	TS	ECCP	RIGHT 7
19783	REF	4	LAST	441	4133	3	023	0	CA	EDOP	PLACE MONITOR VERB OR PLEASE VERB INTO
197832	REF	91	LAST	434	4134	0	4616	1	TC	BANKCALL	VERPREG AND DISPLAY IT.
197823	REF	7	LAST	42F	4135	62	341	0	CAPP	UPDAIVE -1	
197825	REF	88	LAST	440	4136	3	4755	1	CAF	ZERO	ZERO REGRET SC THAT PASTED VERBS CAN
197838	REF	10	LAST	412	4137	55	012	1	TS	REGRET	BE EXECUTED BY OPERATOR.
19784	REF	3	LAST	441	4140	3	1021	0	CA	MCNSAVE2	
19785	REF	1			4141	0	4255	1	TC	BLANKSUB	PROCESS NVMONCPT BLANK OPTION IF ANY
19786					4142	0	4143	0	TC	+1	
19787	REF	50	LAST	440	4143	0	5155	0	ENDPASTE	TC	ENDOFJOB

1979 4144 37600 0 MID7 CCT 37600

1980	REF	1			41,3355				SFTLCC	ENDMONDC +1	
19805	REF	4	LAST	439	441:	79	749*		COUNT*	\$4/PIN	
1981					41,3355	75	377	0	CCT	75377	-DEC10, STARTING IN BITE
1982	REF	1			41,3356	04124	1		MCNREF	ACRES	PASTFVR
1983	REF	2	LAST	399	41,3357	0	4374	0	MCNELSY	TC	RELDSPCN
1984	REF	51	LAST	441	41,3360	0	5155	0	TC	ENDOFJOB	TURN KEY RELEASE LIGHT

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R1985 DSPFMEM IS USED TO DISPLAY (IN OCTAL) ANY FIXED REGISTER.

R1986 IT IS USED WITH ACUN = MACHINE CACR TO BE SPECIFIED. THE FCADR OF THE

R1987 DESIRED LOCATION IS THEN PUNCHED IN. IT HANDLES F/F (FCADR 4000-7777)

R19871 FOR BANKS L/F 27, THIS IS ENOUGH.

R19872 FOR BANKS G/E 30, THE THIRD COMPONENT OF ACUN 26 (PRIO, ACRES, BBCCN)

R19873 MUST BE PRELACED WITH THE DESIRED SUPERBANK BITS (BITS 5,6,7).

R19874 V23N26 SHOULD BE USED.

R19875 SUMMARY

R19876 FOR BANKS L/F 27,

V27N01E(FCADR)E

R19877 FOR BANKS G/E 30,

V23N26E(SUPERBITS)E

V27N01E(FCADR)E

1988	REF	11	LAST	426	41,3361	3 4317 0	DSPFMEM	CAF	RIC1	IF F/F, DATACALL USES BANK C2 OR C3.
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1989	REF	42	LAST	440	41,3362	54 776 0		TS	DSPCCLNT	
------	-----	----	------	-----	---------	----------	--	----	----------	--

19891	REF	17	LAST	375	41,3363	3 1046 1		CA	DSPTFM1 +2	SUPERBANK BITS WERE PRELACED INTO
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19892	REF	58	LAST	430	41,3364	54 001 1		TS	L	3RD COMPONENT OF NOUN 26.
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1990	REF	7	LAST	439	41,3365	3 1016 1		CA	NCLNCAOR	ORIGINAL FCADR LOCATED STILL IN ACUNCAOR.
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1991	REF	1			41,3366	0 4651 1		TC	SUPDACAL	CALL WITH FCADR IN A, SUPERBITS IN L.
------	-----	---	--	--	---------	----------	--	----	----------	---------------------------------------

1992	REF	3	LAST	415	41,3367	0 2371 1		TC	DSPCCTWC	
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1993	REF	52	LAST	441	41,3370	0 5155 0	ENDSPF	TC	ENDOFJCB	
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P1994 WCRF DISPLAY ROUTINES

1995	REF	4	LAST	435	40,3234		SFTLCC	TESTCFUF	+4
19955	REF	5	LAST	433	40,3234	120 625*	CCUNT#	\$\$\$FIN	
1996	REF	103	LAST	438	40,3234	56 002 0	DSPSIGN	XCH	Q
1997	REF	1			40,3235	54 144 1	TS	DSPWCRET	
1998	REF	191	LAST	441	40,3236	10 154 0	CCS	MPAC	
1999					40,3237	0 3247 0	TC	+8D	
2000					40,3240	0 3247 0	TC	+7	
2001	REF	47	LAST	440	40,3241	6 4753 1	AD	ONE	
2002	REF	192	LAST	443	40,3242	54 154 0	TS	MPAC	
2003	REF	2	LAST	403	40,3243	0 2433 1	TC	-CN	
2004	REF	193	LAST	443	40,3244	4 0155 1	CS	MPAC	+1
2005	REF	194	LAST	443	40,3245	54 155 1	TS	MPAC	+1
2006	REF	2	LAST	443	40,3246	0 0144 0	TC	DSPWCRET	
2007	REF	3	LAST	422	40,3247	0 2413 0	TC	+CN	
2008	REF	2	LAST	443	40,3250	0 0144 0	TC	DSPWCRET	

2009					40,3251	0 0006 1	DSPKNC	EXTEND		ROUND BY 5 EXP-6
2010	REF	1			40,3252	3 3315 0	CCA	DECRUND	-1	
2011	REF	195	LAST	443	40,3253	20 155 1	CAS	MPAC		
2012					40,3254	0 0006 1		EXTEND		
2013					40,3255	1 3261 0	BZF	+4		
2014					40,3256	0 0006 1		EXTEND		
2015	REF	1			40,3257	3 4733 1	CCA	DPOSMAX		
2016	REF	196	LAST	443	40,3260	52 155 1	EXCH	MPAC		
2017	REF	174	LAST	443	40,3261	0 0002 0	TC	Q		

P2018 DSPDECWD CONVERTS CC (MPAC, MPAC+1) INTO A SIGN AND 5 CHAR DECIMAL
 R2019 STARTING IN LOC SPECIFIED IN DSPCCNT. IT ROUNDS BY 5 EXP-6.

2020	REF	105	LAST	443	40,3262	55 002 0	DSPDECWD	XCH	Q
2021	REF	1			40,3263	54 115 0	TS	WCRET	
2022	REF	1			40,3264	0 3234 1	TC	DSPSIGN	
2023	REF	1			40,3265	1 3251 1	TC	DSPRND	
2024	REF	7	LAST	334	40,3266	3 4751 0	CAF	FCUR	
2025	REF	1			40,3267	54 137 0	DSPDCWD1	TS	WDCNT
2026	REF	1			40,3270	3 4363 0	CAF	BINCCN	
2027	REF	5	LAST	436	40,3271	0 7212 0	TC	SHCPTMP	
2028	REF	197	LAST	443	40,3272	50 154 1	TRACE1	INDEX	MPAC
2029	REF	3	LAST	400	40,3273	3 4066 0	CAF	RELTP	
2030	REF	5	LAST	431	40,3274	7 4346 0	MASK	LEW5	
2031	REF	6	LAST	424	40,3275	54 124 1	TS	CODE	
2032	REF	89	LAST	441	40,3276	3 4755 1	CAF	ZFPC	
2033	REF	198	LAST	443	40,3277	56 156 0	XCH	MPAC	+2
2034	REF	199	LAST	443	40,3300	56 155 0	XCH	MPAC	+1
2035	REF	200	LAST	443	40,3301	54 154 0	TS	MPAC	
2036	REF	43	LAST	442	40,3302	56 776 1	XCH	DSPCCNT	
2037	REF	4	LAST	424	40,3303	54 143 0	TRACE1S	TS	CCUNT
2038	REF	138	LAST	439	40,3304	10 000 0	CCS	A	

DECREMENT DSPCCNT EXCEPT AT +0

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2039 REF 44 LAST 443 40,330F 54 776 0 TS DSPCCUNT
 2040 REF 4 LAST 424 40,3306 0 3356 1 TC DSPIN
 2041 REF 2 LAST 443 40,3307 10 137 0 CCS WDCNT
 2042 REF 1 LAST 429 40,3310 0 2267 1 TC DSPDCWD1
 2043 REF 7 LAST 429 40,3311 4 4360 1 CS VD1
 2044 REF 45 LAST 444 40,3312 54 776 0 TS DSPCCUNT
 2045 REF 2 LAST 443 40,3313 0 0115 1 TC WCRET

2046 40,3314 00000 1 OCT 00000
 2047 40,3315 02476 0 DECRUNT OCT 02476

R2048 DSPDECNR CONVERTS C(MPAC,MPAC+1) INTO A SIGN AND 5 CHAR DECIMAL
 R2049 STARTING IN LOC SPECIFIED IN DSPCCUNT. IT DOES NOT ROUND

2050 REF 106 LAST 443 40,3316 56 002 0 DSPDECNR XCH G
 2051 REF 3 LAST 444 40,3317 54 115 0 TS WCRET
 2052 REF 2 LAST 443 40,3320 0 3234 1 TC DSPSIGN
 2053 REF 2 LAST 444 40,3321 0 3266 0 TC DSPDCWD1 -1

R2054 DSPDC2NR CONVERTS C(MPAC,MPAC+1) INTO A SIGN AND 2 CHAR DECIMAL
 R2055 STARTING IN LOC SPECIFIED IN DSPCCUNT. IT DOES NOT ROUND

2056 REF 107 LAST 444 40,3322 56 002 0 DSPDC2NR XCH Q
 2057 REF 4 LAST 444 40,3323 54 115 0 TS WCRET
 2058 REF 2 LAST 444 40,3324 0 3234 1 TC DSPSIGN
 2059 REF 48 LAST 442 40,3325 3 4753 1 CAF QNS
 2060 REF 3 LAST 444 40,3326 0 3267 1 TC DSPDCWD1

R2061 DSP2DEC CONVERTS C(MPAC) AND C(MPAC+1) INTO A SIGN AND 10 CHAR DECIMAL
 R2062 STARTING IN THE LOC SPECIFIED IN DSPCCUNT.

2063 REF 108 LAST 444 40,3327 56 002 0 DSP2DEC XCH G
 2064 REF 5 LAST 444 40,3331 54 115 0 TS WCRET
 2065 REF 50 LAST 443 40,3331 3 4755 1 CAF ZERO
 2066 REF 7 LAST 443 40,3332 54 124 1 TS CFDE
 2067 REF 15 LAST 424 40,3333 3 6250 0 CAF THREE
 2068 REF 3 LAST 404 40,3334 0 3440 1 TC 110SPIN -R2 OFF
 2069 REF 8 LAST 443 40,3335 3 4751 0 CAF FOUR
 2070 REF 4 LAST 444 40,3336 0 3440 1 TC 110SPIN +R2 OFF
 2071 REF 4 LAST 444 40,3337 0 3234 1 TC DSPSIGN
 2072 REF 4 LAST 423 40,3340 3 4320 1 CAF R201
 2073 REF 4 LAST 444 40,3341 0 3267 1 END2DEC TC DSPDCWD1

R2074 DSPDECVN DISPLAYS C(A) UPON ENTRY AS A 2 CHAR DECIMAL BEGINNING IN THE
 R2075 DSP LOC SPECIFIED IN DSPCCUNT.
 R2076 C(A) SHOULD BE IN FORM A X 2EXP-14. THIS IS SCALED TO FORM N/10 BEFORE
 R2077 DISPLAY CONVERSION.

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2078				40,3342	0 0006 1	DSPDECVN	EXTEND		
2079	REF	1		40,3343	7 3352 1	MP	VNDSPCCN	MLLT BY .01	
2080	REF	211	LAST	442	40,3344	22 154 1	LXCF	MPAC	TAKE RESULTS FROM L.(MLLT BY 2EXP14).
2081	REF	91	LAST	444	40,3345	3 4755 1	CAF	ZERC	
2082	REF	202	LAST	445	40,3346	54 155 1	TS	MPAC	+1
2083	REF	109	LAST	444	40,3347	56 002 0	XCF	Q	
2084	REF	6	LAST	444	40,3350	54 115 0	TS	WDRET	
2085	REF	3	LAST	425	40,3351	7 3325 0	TC	DSPDC2NR	+3 NO SIGN, NO ROUND, 2 CHAR
2086				40,3352	00244 0	VNDSPCCN	CCT	00244	.01 ROUNDED UP
2087	REF	3	LAST	422	40,3353	7 3342 1	GFVNUPDT	TC	DSPDECVN
2088	REF	27	LAST	437	40,3354	0 4635 0	TC	PCSTJUMP	THIS IS NOT FOR GENERAL USE. REALLY PART
2089	REF	2	LAST	412	40,3355	62251 1	CADR	UPDAT1	OF UPDATV8.
2090				40,3356		FNCECVN	EQUALS		
2091	REF	1		41,3371		SFTLCC	FADSPE	+1	
20915	REF	5	LAST	441	TC 443:	12	761*	COUNT* \$\$/PIN	
R2092	DSPDCTWD DISPLAYS C(A) UPON ENTRY AS A 5 CHAR CCT STARTING IN THE CSP								
R2093	CHAR SPECIFIED IN DSPCOUNT. IT STOPS AFTER 5 CHAR HAVE BEEN DISPLAYED.								
2094	REF	8	LAST	439	41,3371	54 022 0	DSPDCTWD	TS	CYL
2095	REF	111	LAST	445	41,3372	56 002 0	XCF	Q	
2096	REF	7	LAST	445	41,3373	54 115 0	TS	WDRET	MLST USE SAME RETURN AS CSP2BIT.
2097	REF	39	LAST	439	41,3374	3 4736 1	CAF	BIT14	TO BLANK SIGNS
2098	REF	46	LAST	444	41,3375	26 776 0	ADS	DSPCCCNT	
2099	REF	9	LAST	444	41,3376	3 4751 0	CAF	FOUR	
2100	REF	3	LAST	444	41,3377	54 137 0	WDAGAIN	TS	WCCNT
2101	REF	9	LAST	445	41,3400	4 0022 0	CS	CYL	
2102	REF	1	LAST	445	41,3401	4 0022 0	CS	CYL	
2103	REF	11	LAST	445	41,3402	4 0022 0	CS	CYL	
2104	REF	139	LAST	443	41,3403	4 0000 0	CS	A	
2105	REF	1			41,3404	7 4757 1	MASK	DSPMSK	
2106	REF	140	LAST	445	41,3405	50 000 1	INDEX	A	
2107	REF	4	LAST	443	41,3406	3 4066 0	CAF	RELTAB	
2108	REF	6	LAST	443	41,3407	7 4346 0	MASK	LEW5	
2109	REF	8	LAST	444	41,3410	54 124 1	TS	CCDE	
2110	REF	47	LAST	445	41,3411	56 776 1	XCF	DSPCCCNT	
2111	REF	5	LAST	443	41,3412	54 143 0	TS	CCLNT	
2112	REF	141	LAST	445	41,3413	10 000 0	CCS	A	DECREMENT CSPCCCNT EXCEPT AT 40
2113	REF	48	LAST	445	41,3414	54 776 0	TS	DSPCCCNT	
2114	REF	28	LAST	445	41,3415	0 4635 0	TC	PCSTJUMP	
2115	REF	1			41,3416	61446 0	CADR	DSPDCTIN	
2116	REF	4	LAST	445	41,3417	10 137 0	CCTBACK	CCS	WCCNT
2117	REF	1			41,3420	7 3377 1	TC	WDAGAIN	+
2118	REF	8	LAST	444	41,3421	4 4360 1	DSPLV	CS	V01
2119	REF	49	LAST	445	41,3422	54 776 0	TS	DSPCCCNT	TO BLOCK NUMERICAL CHARACTERS, CLEARS, AND SIGNS AFTER A COMPLETED DISPLAY.

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2120 REF 8 LAST 445 41,3423 1 0115 1 TC WDPFT
 2121 REF 4 LAST 432 4757 DSPMSK = SEVEN

R2122 DSP2BIT DISPLAYS C(A) UPON ENTRY AS A 2 CHAR OCT BEGINNING IN THE DSP
 R2123 LCC SPECIFIED IN DSPCOUNT BY FRE CYCLING RIGHT C(A) AND USING THE LOGIC
 R2124 OF THE 5 CHAR OCTAL DISPLAY

2125 REF 3 LAST 233 41,3424 54 020 1 DSP2BIT TS CYP
 2126 REF 111 LAST 445 41,3425 56 012 0 XCH Q
 2127 REF 9 LAST 446 41,3426 54 115 0 TS WDPFT
 2128 REF 49 LAST 444 41,3427 3 4753 1 CAF ONE
 2129 REF 5 LAST 445 41,3430 54 137 0 TS WDCNT
 2130 REF 4 LAST 446 41,3431 4 0020 1 CS CYR
 2131 REF 5 LAST 446 41,3432 4 0020 1 CS CYP
 2132 REF 6 LAST 446 41,3433 56 023 0 XCH CYP
 2133 REF 12 LAST 445 41,3434 54 022 0 TS CYL
 2134 REF 2 LAST 445 41,3435 0 340 1 TC WDCAGAIN +5

R2135 FOR DSPIN PLACE 0/25 OCT INTO COUNT, 5 BIT RELAY CODE INTO CODE. BOTH
 R2136 ARE DESTROYED. IF BIT14 OF COUNT IS 1, SIGN IS BLANKED WITH LEFT CHAR.
 R2137 FOR DSPIN1 PLACE 0,1 INTO BIT11 OF CODE, 2 INTO COUNT, REL ADDRESS OF
 R2138 DSPIN ENTRY INTO DSPFL.

2139 REF 1 40,3356 SFTLCC ENDFCVN

21395 REF 6 LAST 443 TO 445: 82 687* COUNT* \$\$\$PIN

2140 REF 112 LAST 446 40,3356 56 002 0 DSPIN XCH Q CANT USE L FOR RETURN, SINCE MANY OF THE
 2141 REF 1 40,3357 54 114 1 TS DSEXIT ROUTINES CALLING DSPIN USE L AS RETURN.
 2142 REF 7 LAST 445 40,3360 3 4346 1 CAF LCW5
 2143 REF 6 LAST 445 40,3361 7 0143 0 MASK CCUNT

2144 REF 6 LAST 430 40,3362 54 021 0 TS SR

2145 REF 7 LAST 446 40,3363 56 021 1 XCH SR

2146 REF 1 40,3364 54 141 1 TS DSPFL

2147 REF 20 LAST 420 40,3365 3 4753 1 CAF BIT1

2148 REF 7 LAST 446 40,3366 7 0143 0 MASK CCUNT

2149 REF 142 LAST 445 40,3367 10 000 0 CCS A

2150 40,3370 0 3372 1 TC +2

2151 REF 1 40,3371 0 3402 1 TC DSPIN1 -1

2152 REF 9 LAST 445 40,3372 56 124 0 XCH CODE

2153 REF 1 40,3373 0 434 1 TC SLEF5

2154 REF 10 LAST 446 40,3374 54 124 1 TS CCFE

2155 REF 40 LAST 445 40,3375 3 4736 1 CAF BIT14

2156 REF 8 LAST 446 40,3376 7 0143 0 MASK CCUNT

2157 REF 143 LAST 446 40,3377 10 000 0 CCS A

2158 REF 29 LAST 435 40,3400 3 4752 0 CAF TWO

2159 REF 50 LAST 446 40,3401 6 4753 1 AD ONE

2160 REF 9 LAST 446 40,3402 54 143 0 TS CCUNT

BIT14 = 1, BLANK SIGN
 BIT14 = 0, LEAVE SIGN ALONE
 +0 INTO COUNT FOR RIGHT

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A2161 +1 INTO COUNT FOR LEFT(SIGN LEFT ALONE)
 A2162 +3 INTO COUNT FOR LEFT(TO BLANK SIGN)
 2163

2164	REF	2	LAST	446	40,3403	0 0004 0	DSPIN1	INHINT		
2165	REF	24	LAST	406	40,3404	50 141 0	INDEX	DSREL		
2166					40,3405	11 0022 1	CCS	DSPTAB		
2167	REF	6	LAST	434	40,3406	0 3410 1	TC	+2	IF +	
2168	REF	51	LAST	446	40,3407	0 5675 0	TC	CCSHCLF		
2169	REF	1			40,3410	6 4753 1	AD	ONE	IF-	
2170	REF	18	LAST	446	40,3411	54 142 1	TS	DSMAG		
2171	REF	1			40,3412	50 143 1	INDEX	CCUNT		
2172	REF	1			40,3413	7 3434 0	MASK	DSMSK		
2173	REF	11	LAST	446	40,3414	0 0006 1	EXTEND			
2174					40,3415	60 124 0	SU	CCDE		
2175	REF	1			40,3416	0 0006 1	EXTEND			
2176	REF	11	LAST	447	40,3417	1 3432 0	BZF	DSLX	SAME	
2177	REF	2	LAST	447	40,3420	50 143 1	DERNT	INDEX	CCUNT	
2178	REF	2	LAST	447	40,3421	4 3434 0	CS	DSMSK	MASK WITH 77740,76037,75777, CR 74037	
2179	REF	2	LAST	447	40,3422	7 0142 1	MASK	DSMAG		
2180	REF	12	LAST	447	40,3423	6 0124 0	AD	CCDE		
2181	REF	144	LAST	446	40,3424	4 0000 0	CS	A		
2182	REF	3	LAST	447	40,3425	50 141 0	INDEX	DSREL		
2183	REF	25	LAST	447	40,3426	57 0022 0	XCH	DSPTAB		
2184	REF	2	LAST	447	40,3427	0 0006 1	EXTEND			
2185	REF	2	LAST	447	40,3430	6 2432 1	BZMF	DSLX	DSPTAB ENTRY WAS -	
2186	REF	7	LAST	406	40,3431	25 0015 1	INCR	NCUT	DSPTAB ENTRY WAS +	
2187	REF	2	LAST	446	40,3432	0 0003 1	DSLX	RELINT		
2188					40,3433	0 0114 0	TC	DSFXLT		
2189					40,3434	00037 0	DSMSK	CCT	37	
2190					40,3435	01740 0		CCT	1740	
2191					40,3436	02000 0		CCT	2000	
2192					40,3437	03740 1		CCT	3740	

R2192 FOR 11CSPIN, PUT REL ADDRESS OF DSPTAB ENTRY INTO A, 1 IN BIT11 CR 0 IN
 R2193 BIT11 OF CODE.

2194	REF	4	LAST	447	40,3440	54 141 1	11DSFIN	TS	DSREL	
2195	REF	30	LAST	446	40,3441	3 4752 0	CAF	TWO		
2196	REF	12	LAST	447	40,3442	54 143 0	TS	CCUNT		
2197	REF	113	LAST	446	40,3443	56 002 0	XCH	Q	MUST USE SAME RETURN AS DSPIN	
2198	REF	3	LAST	447	40,3444	54 114 1	TS	DSFXIT		
2199	REF	2	LAST	446	40,3445	0 3403 0	TC	DSPIN1		
2200	REF	5	LAST	444	40,3446	0 2356 1	DSPOCTIN	TC	DSPIN	SO DSPOCTIN DOESNT USE SWCALL
2201					40,3447	3 3451 1	CAF	+2		
2202	REF	5	LAST	423	40,3450	0 4640 1	TC	BANKJLMP		
2203	REF	1			40,3451	63417 0	ENDSPOCT	CADR	OCTBACK	

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R2204 DSPALARM FINDS TO NVSUBEND IN ENTRET FOR NVSLR INITIATED ROUTINES.

R2205 ABORT WITH 115J1.

R2206 DSPALARM FINDS TO ENDCJOB IN ENTRET FOR KEYCARD INITIATED ROUTINES.

R2207 GO TO ENTRET.

22075	REF	9	LAST	445	40,3452	4 4360	1	PREDSFAL	CS	VD1	
22076	REF	50	LAST	445	40,3453	54 776	0		TS	DSPCCLNT	
2208	REF	1			40,3454	4 3475	0	DSPALARM	CS	NVSBENDL	
2209	REF	8	LAST	439	40,3455	6 0136	0		AC	ENTEXIT	
2210					40,3456	0 0006	1		EXTEND		
2211	REF	16	LAST	400	40,3457	1 3472	1		BZF	CHARALRM +2	
22111	REF	1			40,3460	4 3474	1		CS	MCNADR	IF THIS IS A MONITOR, KILL IT
22112	REF	9	LAST	448	40,3461	6 0136	0		AD	ENTEXIT	
22113					40,3462	0 0106	1		EXTEND		
22114					40,3463	1 2465	1		BZF	+2	
22115	REF	17	LAST	448	40,3464	0 3470	1		TC	CHARALRM	
22116	REF	1			40,3465	0 4204	0		TC	KILMCACN	
22117	REF	3	LAST	263	40,3466	0 4364	1		TC	FALTCN	
22118	REF	2	LAST	441	40,3467	0 4124	1		TC	PASTEVB	PUT MONITOR VERB BACK IN VERBREG
2212	REF	4	LAST	448	40,3470	0 4364	1	CHARALRM	TC	FALTCN	NOT NVSUP INITIATED. TURN ON OPR ERROR
2213	REF	53	LAST	442	40,3471	0 5155	0		TC	ENDCEJCB	
2214	REF	2	LAST	244	40,3472	0 5642	1		TC	PCODDD	
2217					40,3473	21501	0		CCT	21501	
22171	REF	3	LAST	448	40,3474	04124	1	MCNADR	CENADR	PASTEVB	
2218	REF	1			40,3475	0 4202	0	NVSBENDL	TC	NVSBENDC	

R2219 ALMCYCLE TURNS ON CHECK FAIL LIGHT, REDISPLAYS THE ORIGINAL VERB THAT
 R2220 WAS EXECUTED, AND RECYCLES TO EXECUTE THE ORIGINAL VERB/NOON COMBINATION
 R2221 THAT WAS LAST EXECUTED. USED FOR BAD DATA DURING LOAD VERBS AND BY
 R2222 MCTRS. ALSO BY MMCHANG IF 2 NUMERICAL CHARACTERS WERE NOT PUNCHED IN
 R2223 FOR MM CODE.

2224	REF	3	LAST	441	4145			SETLOC	MID7	+1	
22245	REF	2	LAST	441	TC 441:	17	17*	COUNT*	\$/PIN		
2225	REF	5	LAST	448	4145	0 4364	1	ALMCYCLE	TC	FALTCN	TURN ON CHECK FAIL LIGHT.
2228	REF	3	LAST	438	4146	4 1040	0	CS	VERBSAVE		GET ORIGINAL VERB THAT WAS EXECUTED
2229	REF	11	LAST	441	4147	55012	1	TS	RFORET		SET FOR ENTPASC
2230	REF	92	LAST	441	4150	0 4616	1	TC	BANKCALL		PUTS ORIGINAL VERB INTO VERBREG AND
2231	REF	8	LAST	441	4151	62341	0	CADR	UPDATVR	-1	DISPLAYS IT IN VERB LIGHTS.
2232	REF	29	LAST	445	4152	0 4635	0	TC	POSTJUMP		
2233	REF	2	LAST	400	4153	62002	1	ENDALM	CADR	ENTER	

R2234 MMCHANG USES NOON DISPLAY UNTIL ENTER. THEN IT USES MODE DISP.
 R2235 IT GOES TO MODROUT WITH THE NEW MM CODE IN A, BUT NOT DISPLAYED IN
 R2236 MM LIGHTS.
 R2237 IT DEMANDS 2 NUMERICAL CHARACTERS BE PUNCHED IN FOR NEW MM CODE.
 R2238 IF NOT, IT RECYCLES.

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2239	REF	1			41,3436				SFTLCC DSP2BIT +100		
22395	REF	6	LAST	445	TO	446:	37	758*	CCLNT# \$\$\$/PIN		
2240	REF	1			41,3436		0	3461	0	MMCHANG	TC REQMM
A2241											ENTFASHI ASSUMES THE TC REQMM AT MMCHANG
A2242											IF THIS MOVES AT ALL, MUST CHANGE
2243	REF	23	LAST	377		41,3437	3	4747	1	CAF	BIT5
2244	REF	51	LAST	448		41,3440	6	0776	1	AD	DSPCCUNT
2245						41,3441	2	0016	1	EXTEND	
2246						41,3442	1	3444	1	BZF	+2
2247	REF	14	LAST	438		41,3443	0	4145	0	TC	ALMCYCLE
2248	REF	92	LAST	445		41,3444	3	4755	1	CAF	ZERO
2249	REF	12	LAST	430		41,3445	57	0011	1	XCF	NCUNREG
2250	REF	213	LAST	445		41,3446	54	154	0	TS	MPAC
2251	REF	5	LAST	412		41,3447	3	4361	1	CAF	ND1
2252	REF	52	LAST	449		41,3450	54	776	0	TS	DSPCCUNT
2253	REF	93	LAST	448		41,3451	0	4616	1	TC	BANKCALL
2254	REF	4	LAST	416		41,3452	606	011	0	CADR	2BLANK
2255	REF	10	LAST	448		41,3453	4	4360	1	CS	VCL
2256	REF	53	LAST	449		41,3454	54	776	0	TS	DSPCCUNT
2257	REF	204	LAST	449		41,3455	3	0154	1	CA	MPAC
2258	REF	30	LAST	448		41,3456	0	4635	0	TC	PCSTJUMP
2259	REF	1				41,3457	10040	1		CADR	MODRCUTE
											GC THRU STANDARD LCC.
2260	REF	2	LAST	299		41,3460				MODRCUTE =	V37
2261	REF	114	LAST	447		41,3460	4	0002	1	REQMM	CS
2262	REF	12	LAST	448		41,3461	55	0112	1	TS	REQFT
2263	REF	6	LAST	449		41,3462	3	4261	1	CAF	ND1
2264	REF	54	LAST	449		41,3463	54	776	0	TS	DSPCCUNT
2265	REF	93	LAST	449		41,3464	3	4755	1	CAF	ZERO
2266	REF	13	LAST	449		41,3465	55	0011	0	TS	NCUNREG
2267	REF	94	LAST	449		41,3466	0	4616	1	TC	BANKCALL
2268	REF	5	LAST	449		41,3467	606	011	0	CADR	2BLANK
2269	REF	3	LAST	412		41,3470	0	4427	1	TC	FLASHCN
2270	REF	52	LAST	447		41,3471	3	4753	1	CAF	ONE
2271	REF	18	LAST	438		41,3472	54	777	1	TS	DECRRNCH
2272	REF	10	LAST	448		41,3473	0	0136	0	TC	ENTEXIT
											SET FOR DEC
R2273	VBRQEXEC ENTERS REQUEST TO EXEC FOR ANY ADDRESS WITH ANY PRIORITY.										
R2274	IT DOES ENDQFJOB AFTER ENTERING REQUEST. DISPLAY SYST IS RELEASED.										
R2275	IT ASSUMES ACUN 26 HAS BEEN PRELACED WITH										
R2276	COMPONENT 1 PRIORITY(BITS 12-14) BIT1=0 FOR NCVAC, BIT1=1 FOR FNDVAC.										
R2277	COMPONENT 2 JCB ADRES (12 BIT)										
R2278	COMPONENT 3 RECCN										
2279	REF	21	LAST	446		41,3474	3	4753	1	VBRQEXEC	CAF
2280	REF	18	LAST	442		41,3475	7	1144	1		MASK
2281	REF	145	LAST	447		41,3476	10	000	0		CCS
											DSPTRM1
											A

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2282	REF	1		41,3477	0 3516 0	TC	SFTVAC		IF BIT1 = 1, FINDVAC
2283	REF	1		41,3500	3 4351 1	CAF	TCNCVAC		IF BIT1 = 0, NCVAC
2284	REF	205	LAST 449	41,3501	54 154 0	REQEX1	TS	MPAC	TC NCVAC CF TC FINDVAC INTO MPAC
2285	REF	22	LAST 449	41,3502	4 4753 0		CS	RIT1	
2286	REF	19	LAST 449	41,3503	7 1044 1		MASK	DSPTM1	
2287	REF	216	LAST 450	41,3504	54 160 1		TS	MPAC +4	PPIC INTO MPAC+4 AS A TEMP
2288	REF	6	LAST 429	41,3505	0 4457 0	REQFSTC	TC	RELDSF	
2289	REF	5	LAST 439	41,3506	3 4217 1		CA	ENDINST	
2290	REF	207	LAST 450	41,3507	54 157 0		TS	MPAC +3	TC ENDCFJCB INTO MPAC+3
2291				41,3510	0 0106 1		EXTEND		
2292	REF	20	LAST 450	41,3511	3 1046 1		PCA	DSPTM1 +1	JCB ACRES INTO MPAC+1
2293	REF	208	LAST 450	41,3512	52 156 1		EXCF	MPAC +1	BBCON INTO MPAC+2
2294	REF	209	LAST 450	41,3513	3 0160 0		CA	MPAC +4	PPIC IN A
2295				41,3514	0 0004 0		INHINT		
2296	REF	210	LAST 450	41,3515	0 0154 1		TC	MPAC	
2297	REF	1		41,3516	3 4354 1	SFTVAC	CAF	TCFINDVC	
2298	REF	1		41,3517	0 3501 0		TC	REQEX1	

R2299 VPRQWAIT ENTERS REQUEST TO WAITLIST FOR ANY ADDRESS WITH ANY DELAY.

R2300 IT DOES ENDCFJCB AFTER ENTERING REQUEST. DISPLAY SYST IS RELEASED.

R2301 IT ASSUMES ACUM 26 HAS BEEN PRELOADED WITH

R2302 COMPONENT 1 DELAY (LOW BITS)

R2303 COMPONENT 2 TASK ACRES (12 BIT)

R2304 COMPONENT 3 BBCON

2305	REF	1		41,3520	3 4352 1	VBRQWAIT	CAF	TCWAIT	
2306	REF	211	LAST 450	41,3521	54 154 0		TS	MPAC	TC WAITLIST INTO MPAC
2307	REF	21	LAST 450	41,3522	3 1044 0		CA	DSPTM1	TIME DELAY
2308	REF	1		41,3523	0 3504 0	ENDRQWT	TC	REQUESTC -1	

R2309 REQUESTC WILL PUT TASK ACRES INTO MPAC+1, BBCON INTO MPAC+2,

R2310 TC ENDCFJCB INTO MPAC+3. IT WILL TAKE TIME DELAY CLT CF MPAC+4 AND

R2311 LEAVE IT IN A, INHINT AND TC MPAC.

2312	REF	2	LAST 448	40,3476			SFTLCC	NVSRENCL +1	
23125	REF	7	LAST 446 TO 448:	80	767*		COUNT*	\$/PIA	
2313	REF	53	LAST 449	40,3476	3 4753 1	VEPRCC	CAF	CNE	PROCEED WITHOUT DATA
2314	REF	2	LAST 429	40,3477	55 013 0		TS	LOADSTAT	
2315	REF	2	LAST 448	40,3500	0 4204 0		TC	KILLMONON	TURN ON KILL MONITOR BIT
2316	REF	7	LAST 450	40,3501	1 4457 0		TC	RELDSF	
2317	REF	3	LAST 407	40,3502	0 4433 1		TC	FLASHOFF	
2318	REF	2	LAST 429	40,3503	0 3612 1		TC	RECALLTST	SEE IF THERE IS ANY RECALL FROM ENDICL
2319	REF	54	LAST 450	40,3504	4 4753 0	VBTERM	CS	CNE	
2320	REF	2	LAST 414	40,3505	0 3477 0		TC	VBPRCC +1	TERM VEPE SETS LOADSTAT NEG

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R23201 PROCKEY PERFORMS THE SAME FUNCTION AS VBPRCC. IT MUST BE CALLED UNDER
 R23202 EXECUTIVE CONTROL, WITH CHOPPID.

232033 REF 19 LAST 441 40,3516 4 100 1 PROCKEY CS VERPREG CONT ALLOW PROCEED DURING LOAD.

232036 REF 1 40,3517 6 2523 0 AD VBSP2LD* DEC 22

23204 REF 40,3510 0 0016 1 EXTEND

232043 REF 146 LAST 446 40,3511 26 000 0 CTM A

232046 REF 40,3512 0 0016 1 EXTEND

23205 REF 18 LAST 448 40,3513 1 3470 0 BZF CHARALPM

232053 REF 94 LAST 449 40,3514 3 4755 1 PROCKEY1 CAF ZERO SET REGRET FOR ENTER PASS 0.

23206 REF 13 LAST 446 40,3515 55 0012 1 TS REGRET

23207 REF 11 LAST 446 40,3516 4 4360 1 CS VCI BLOCK NUMERICAL CHARACTERS, SIGNS, CLEAR

23208 REF 55 LAST 449 40,3517 54 776 0 TS DSPCCCLNT

23209 REF 3 LAST 450 40,3520 0 3476 1 TC VBPRCC

P2321 VBRESEQ WAKES ENDIDLE AT SAME LINE AS FINAL ENTER OF LOAD (L+3).

P2322 (MAIN USE IS INTENDED AS RESPONSE TO INTERNALLY INITIATED FLASHING

R2323 DISPLAYS IN ENDIDLE. SHOULD NOT BE USED WITH LOAD VERES, PLEASE PERFORM,

R2324 OR PLEASE MARK VERES BECAUSE THEY ALREADY USE L+3 IN ANOTHER CONTEXT.)

2325 REF 95 LAST 451 40,3521 4 4755 0 VERESEQ CS ZERO MAKE IT LOCK LIKE DATA IN.

2326 REF 4 LAST 451 40,3522 0 3477 0 TC VBPRCC +1

23265 40,3523 0026 0 VBSP2LD* DEC 22 VE22 = FLOAD

R2327 FLASH IS TURNED OFF BY PROCEED WITHOUT DATA, TERMINATE, RESEQUENCE,

R2328 END OF LOAD.

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P2329 KEY RELEASE ROUTINE

R2330 THIS ROUTINE ALWAYS TURNS OFF THE UPACT LIGHT AND ALWAYS CLEARS DSPLOCK.

R2331 THE HIGHEST PRIORITY FUNCTION OF THE KEY RELEASE BUTTON IS THE
 R2332 UNSUSPENDING OF A SUSPENDED MONITOR WHICH WAS EXTERNALLY INITIATED.

R2333 THIS FUNCTION IS ACCOMPLISHED BY CLEARING DSPLOCK AND TURNING OFF
 R2334 THE KEY RELEASE LIGHT IF BOTH DSPLIST AND CADRSTOR ARE EMPTY.

R2335 IF NO SUCH MONITOR EXISTS, THEN RELDSP IS EXECUTED TO CLEAR DSPLOCK
 R2336 AND THE EXTERNAL MONITOR BIT (FREEING THE DISPLAY SYSTEM FOR INTERNAL
 R2337 USE), TURN OFF THE KEY RELEASE LIGHT, AND WAKE UP ANY JOB IN DSPLIST.

R2338 IN ADDITION IF THERE IS A JOB IN ENCDLE, THEN CONTROL IS TRANSFERRED
 R2339 TO PINBRNCH (IN DISPLAY INTERFACE ROUTINE) TO RE-EXECUTE THE SERIES OF
 R23391 AVSUB CALLS ETC. THAT PRECEDED THE ENCDLE CALL STILL AWAITING RESPONSE.
 R2340 THIS FEATURE IS INTENDED FOR USE WHEN THE OPERATOR HAS BEEN REQUESTED TO
 R2341 RESPOND TO SOME INTERNAL ACTION THAT USED ENCDLE, BUT HE HAS WRITTEN
 R2342 OVER THE INFORMATION ON THE DISPLAY PANEL BY SOME DISPLAYS OF HIS OWN
 R2343 INITIATION WHICH DO NOT SERVE AS RESPONSES. HITTING KEY RLSE WILL
 R2344 RE-ESTABLISH THE DISPLAYS TO THE STATE THEY WERE IN BEFORE HE OBSERVED
 R2345 THEM, SO THAT HE CAN SEE THE WAITING REQUEST. THIS WORKS ONLY FOR
 R2346 INTERNAL PROGRAMS THAT USED ENCDLE THROUGH MARGARET'S DISPLAY
 R2347 SUBROUTINES.

2348	REF	22	LAST	425	40,3524	4 4751 1	VPRELDSF	CS	BIT3	
2349					40,3525	0 0006 1		EXTEND		
2350	REF	11	LAST	220	40,3526	03 011 1		WAND	DSALNOUT	TURN OFF UPACT LITE
2351	REF	2	LAST	399	40,3527	10 115 0		CCS	21/22REG	CLD DSPLOCK
2352	REF	41	LAST	446	40,3530	3 4736 1		CAF	BIT14	
2353	REF	6	LAST	441	40,3531	7 1020 0		MASK	MENSAVF1	EXTERNAL MONITOR BIT (EMP)
2354	REF	147	LAST	451	40,3532	10 000 0		CCS	A	
2355	REF	1			40,3533	0 2542 1		TC	UNSUSPEN	CLD DSPLOCK AND EMB BCTH 1, UNSUSPEND.
2356	REF	8	LAST	450	40,3534	0 4457 0	TSTLTS4	TC	RELDSP	NOT UNSUSPENDING EXTERNAL MONITOR,
2357	REF	5	LAST	440	40,3535	11 041 1		CCS	CADRSTOR	RELEASE DISPLAY SYSTEM AND
2358					40,3536	0 3540 0		TC	+2	DO RE-ESTABLISH IF CADRSTOR IS FULL.
2359	REF	54	LAST	448	40,3537	0 5155 0		TC	ENDCFJOB	
2360	REF	31	LAST	449	40,3540	0 4635 0		TC	POSTJUMP	
2361	REF	4	LAST	299	40,3541	21051 0		CADR	PINBRNCH	
2362	REF	96	LAST	451	40,3542	3 4755 1	UNSUSPEN	CAF	ZERO	EXTERNAL MONITOR IS SUSPENDED,
2363	REF	5	LAST	440	40,3543	55 011 1		TS	DSPLOCK	JUST UNSUSPEND IT BY CLEARING DSPLOCK.
2364	REF	6	LAST	452	40,3544	11 041 1		CCS	CADRSTOR	TURN KEY RELEASE LIGHT OFF IF BCTH
2365	REF	55	LAST	452	40,3545	0 5155 0		TC	ENDCFJOB	CADRSTOR AND DSPLIST ARE EMPTY.
2366	REF	2	LAST	440	40,3546	1 4502 1		TC	RELDSP1	
23661	REF	56	LAST	452	40,3547	0 5155 0		TC	ENDCFJOB	

2367 40,3550 ENDRFLDS EQUALS

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R2368 NVSUB IS USED FOR SUB ROUTINE CALLS FROM WITHIN COMPUTER. IT CAN BE
R2369 USED TO CALL THE COMBINATION OF ANY DISPLAY, LOAD, OR MONITOR VERB
R2370 TOGETHER WITH ANY NOUN AVAILABLE TO THE KEYBOARD.

R23701 PLACE CUVVVVVVVVNNNNNN INTO A.
R23702 V-S ARE THE 7 BIT VERB CODE. N-S ARE THE 7 BIT NOUN CODE.

R23703 IF NVSUB IS CALLED WITH THE FOLLOWING NEGATIVE NUMBERS (RATHER THAN THE
R23704 VERB-NOUN CODE) IN A, THEN THE DISPLAY IS BLANKED AS FOLLOWS-
R23705 -4 FULL BLANK, -3 LEAVE MODE, -2 LEAVE MODE AND VERB, -1 BLANK R-S ONLY.

R2371 NVSUB CAN BE USED WITH EACH CADR TO BE SPEC BY PLACING THE CADR INTO
R2372 MPAC+2 BEFORE THE STANDARD NVSUB CALL.

R2373 NVSUB RETURNS TO 2+ CALLING LCC AFTER PERFORMING TASK, IF DISPLAY
R2374 SYSTEM IS AVAILABLE. THE NEW NOUN AND VERB CODES ARE DISPLAYED.
R2375 IF V-S =0, THE NEW NOUN CODE IS DISPLAYED ONLY (RETURN WITH NO FURTHER
R2376 ACTION). IF N-S =0, THE NEW VERB CODE IS DISPLAYED ONLY (RETURN WITH NO
R2377 FURTHER ACTION).

R2378 IT RETURNS TO 1+ CALLING LCC WITHOUT PERFORMING TASK, IF DISPLAY
R2379 SYSTEM IS BLOCKED (NOTHING IS DISPLAYED IN THIS CASE).
R2380 IT DOES TO ABORT (WITH COT 01501) IF IT ENCOUNTERS A DISPLAY PROGRAM
R2381 ALARM CONDITION BEFORE RETURN TO CALLER.

R2382 THE DISPLAY SYSTEM IS BLOCKED BY THE DEPRESSION OF ANY
R2383 KEY, EXCEPT ERROR LIGHT RESET
R2384 IT IS RELEASED BY THE KEY RELEASE BUTTON, ALL EXTENDED VERBS,
R2385 PROCEED WITHOUT DATA, TERMINATE, RESEQUENCE, INITIALIZE EXECUTIVE,
R2386 RECALL PART OF RECALLIST IF ENCODE WAS USED,
R2387 VB = REQUEST EXECUTIVE, VB = REQUEST WAITLIST,
R2388 MONITOR SET UP.

R23881 THE DISPLAY SYSTEM IS ALSO BLOCKED BY THE EXTERNAL MONITOR BIT, WHICH
R23882 INDICATES AN EXTERNALLY INITIATED MONITOR IS RUNNING (SEE MONITOR)

R2389 A NVSUB CALL THAT PASSES DSELOCK AND THE EXTERNAL MONITOR BIT ENDS CLE
R23891 MONITOR.

R2390 DSELOCK IS THE INTERLOCK FOR USE OF KEYBOARD AND DISPLAY SYSTEM WHICH
R2391 LOCKS OUT INTERNAL USE WHENEVER THERE IS EXTERNAL KEYBOARD ACTION.

R23911 NVSUB SHOULD BE USED TWICE IN SUCCESSION FOR :PLEASE PERFORM: SITUATIONS
R23912 (SIMILARLY FOR PLEASE MARK). FIRST PLACE THE CODED NUMBER FOR WHAT
R23913 ACTION IS DESIRED OF OPERATOR INTO THE REGISTERS REFERRED TO BY THE
R23914 :CHECKLIST: NOUN. GO TO NVSUB WITH A DISPLAY VERB AND THE :CHECKLIST:
R23915 NOUN. GO TO NVSUB AGAIN WITH THE :PLEASE PERFORM: VERB AND ZEROS IN THE
R23916 LOW 7 BITS. THIS :PASTES UP: THE :PLEASE PERFORM: VERB INTO THE VERB
R23917 LIGHTS.

R23918 NVMNCEPT IS AN ENTRY SIMILAR TO NVSUB, BUT REQUIRING AN ADDITIONAL

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R239181 PARAMETER IN L. IT SHOULD BE USED ONLY WITH A MONITOR VERB-NOUN CODE IN
 R239182 A. AFTER EACH MONITOR DISPLAY A *PLEASE* VERB WILL BE PASTED IN THE VERB
 R239183 LIGHTS OR DATA WILL BE BLANKED (OR BOTH) ACCORDING TO THE OPTIONS
 R239184 SPECIFIED IN L. IF BITS 8-14 OF L ARE OTHER THAN ZERO, THEN THEY WILL
 R239185 BE INTERPRETED AS A VERB CODE AND PASTED IN THE VERB LIGHTS. (THIS VERB
 R239186 CODE SHOULD DESIGNATE ONE OF THE *PLEASE* VERBS.) IF BITS 1-3 OF L ARE
 R239187 OTHER THAN ZERO, THEN THEY WILL BE USED TO BLANK DATA BY BEING FED TO
 R239188 BLANKSUB. IF NVMONOPT IS LSED WITH A VERB OTHER THAN A MONITOR VERB,
 R239189 THE PARAMETER IN L HAS NO EFFECT.

R2392 NVSUB IN FIXED-FIXED PLACES 2+CALLING LCC INTO NVGTEM, TO NVSUBEND INTO
 R2393 ENTRET. (THIS WILL RESTORE OLD CALLING BANK BITS)

2394 REF 1 4154 SETLCC ENDALM +1

23945 REF 3 LAST 448 TO 449: 7 24* COUNT* \$\$/PIN
 2395 4154 22 007 0 NVSUB LXCH 7 ZERC NVMONOPT OPTIONS
 2396 REF 1 4155 54 123 0 NVMONOPT TS NVTEMP

2397 REF 42 LAST 452 4156 3 4736 1 CAF BIT14
 23971 REF 7 LAST 452 4157 7 1020 0 MASK MCNSAVE1 EXTERNAL MONITOR BIT
 23972 REF 6 LAST 452 4160 6 1211 0 AC DSPLOCK

23973 REF 148 LAST 452 4161 10 000 0 CCS A
 23974 REF 115 LAST 449 4162 0 0002 0 TC 0 DSP SYST BLOCKED. RET TO 1+ CALLING LCC
 2398 REF 55 LAST 450 4163 3 4753 1 CAF ONE DSP SYST AVAILABLE

2399 REF 116 LAST 454 4164 6 0002 0 NVSBCCM AD 0
 2400 REF 1 4165 55 036 1 TS NVGTEM 2+ CALLING LCC INTO NVGTEM
 24001 REF 4 LAST 441 4166 23 021 0 LXCH MCNSAVE2 STORE NVMONOPT OPTIONS

2401 REF 3 LAST 450 4167 0 4204 0 TC KILLMONON TLRN CA KILL MONITOR BIT
 2402 REF 1 4170 3 4201 0 NVSUPCCM CAF NVSBRBNK

2403 REF 11 LAST 371 4171 56 006 1 XCF BRANK
 24031 4172 0 0006 1 EXTEND SAVE OLD SUPERBITS

24032 REF 4 LAST 275 4173 04 007 1 RCP SUPERBNK

2404 REF 1 4174 55 037 0 TS NVBNKTEM

24041 REF 2 LAST 275 4175 3 4201 0 CAF PINSUPRT

24042 4176 0 0006 1 EXTEND

24043 REF 5 LAST 454 4177 01 007 1 WRITE SUPERBNK

2405 REF 1 4200 0 2000 0 TC NVSUPB CC TO NVSUE1 THRU STANDARD LCC

2406 REF 56 LAST 451 0776 EBANK= DSPCLNT

2407 REF 2 LAST 407 4201 62101 0 NVSBRBNK EBCCN NVSUB1

24071 REF 2 LAST 454 4201 PINSUPRT = NVSBRBNK CONTAINS THE PINBALL SUPERBITS.

2412 REF 2 LAST 454 4202 53 037 0 NVSUBEND DXCH NVGTEM NVBNKTEM MUST = NVGTEM+1

2413 REF 2 LAST 284 4203 0 5165 0 TC SUPDXCFZ DTCP WITH SUPERBIT SWITCHING

2414 REF 1 41,3524 SETLCC ENDRGWT +1

241405 REF 7 LAST 449 TO 450: 54 352* COUNT* \$\$/PIN

R241412 BLANKDSP BLANKS DISPLAY ACCORDING TO OPTION NUMBER IN NVTEMP AS FOLLOWS

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R241415 -4 FULL BLANK, -3 LEAVE MCEE, -2 LEAVE MCEE AND VERR, -1 BLANK R-S ONLY

241419	REF	5	LAST	446	41,3524	6 4757 0	BLANKESP AD	SEVEN	7,8,9,CR 10 (A FAC 0,1,2,CR 3)	
241422					41,3525	0 0004 0	INHINT			
241425	REF	13	LAST	447	41,3526	54 124 1	TS	CCDE	BLANK SPECIFIED DSPTABS	
241425	REF	20	LAST	454	41,3527	4 4740 1	CS	BIT12		
241422	REF	14	LAST	455	41,3531	50 124 0	INDEX	CCDE		
241435	REF	26	LAST	447	41,3531	57 022 0	XCF	DSPTAB		
241435	REF	149	LAST	454	41,3532	10 000 0	CCS	A		
241442	REF	8	LAST	447	41,3533	25 015 1	INCR	NCUT		
241445					41,3534	0 2535 1	TC	+1		
241449	REF	15	LAST	455	41,3535	10 124 1	CCS	CCDE		
241452	REF	1			41,3536	0 3526 0	TC	BLANKESP +2		
241455					41,3537	0 0002 1	RELINT			
241455	REF	2	LAST	454	41,3541	50 122 1	INDEX	NVTEMP		
241462					41,3541	0 3546 1	TC	+5		
241465					41,3542	0 3543 1	TC	+1	NVTEMP HAS -4 (INVER TCUCH MCCREG)	
241465	REF	20	LAST	451	41,3543	55 000 1	TS	VERBREG	-3	
241472	REF	14	LAST	445	41,3544	55 001 0	TS	NCUAREFG	-2	
241475	REF	12	LAST	420	41,3545	55 014 1	TS	CLPASS	-1	
241475	REF	12	LAST	451	41,3546	4 436 1	CS	VE1		
241482	REF	57	LAST	454	41,3547	54 776 0	TS	DSFCCUNT		
241485	REF	4	LAST	450	41,3550	0 4433 1	TC	FLASHCHF	PROTECT AGAINST INVISIBLE FLASH	
241485	REF	1			41,3551	0 3574 1	TC	ENTSFT -2	ZEROS REGRET	
2415	REF	2	LAST	455	41,3552	3 3576 0	NVSLB1	CAF	ENTSFT	IN BANK
2416	REF	6	LAST	441	41,3553	54 136 1	TS	ENTRET	SET RETURN TO NVSLBEND	
24161	REF	3	LAST	455	41,3554	10 123 0	CCS	NVTEMP	WHAT NEW	
24162					41,3555	0 2561 0	TC	+4	NORMAL NVSUB CALL (EXECUTE VN CR PASTE)	
24163	REF	19	LAST	416	41,3556	0 2353 0	TC	GODSPALM		
24164	REF	2	LAST	455	41,3557	0 3524 1	TC	BLANKESP	BLANK DISPLAY AS SPECIFIED	
24165	REF	20	LAST	455	41,3560	0 2353 0	TC	GODSPALM		
2417	REF	5	LAST	441	41,3561	3 6077 1	CAF	LCW7		
2418	REF	4	LAST	455	41,3562	7 0122 0	MASK	NVTEMP		
2419	REF	212	LAST	450	41,3563	54 157 0	TS	MPAC	+3	TEMP FOR NCUN (CANT USE MPAC. DSPCECVN
2420	REF	5	LAST	455	41,3564	3 0123 1	CA	NVTEMP	LSES MPAC, +1, +2	
2422	REF	5	LAST	441	41,3565	54 023 1	TS	EDCP	RIGHT 7	
2423	REF	6	LAST	455	41,3566	3 0023 0	CA	EDCP		
2424	REF	213	LAST	455	41,3567	54 160 1	TS	MPAC	+4	TEMP FOR VERR (CANT USE MPAC+1. DSPCECVN
A2425									USES MPAC, +1, +2).	
2426	REF	214	LAST	455	41,3570	10 157 0	CCS	MFAC	+3	TEST NCUN
2427	REF	1			41,3571	0 3577 1	TC	NVSUB2	IF NCUN ACT +0, GC ON	
2428	REF	215	LAST	455	41,3572	3 0160 0	CA	MPAC	+4	
2429	REF	9	LAST	446	41,3573	0 2341 0	TC	UPDATVB	-1	IF NCUN = +0, DISPLAY VERR. THEN RETURN
24291	REF	97	LAST	452	41,3574	3 4755 1	CAF	ZERO		ZERO REGRET SO THAT PASTED VERBS CAN
24292	REF	14	LAST	451	41,3575	55 012 1	TS	REGRET		BE EXECUTED BY OPERATOR.
2430	REF	2	LAST	446	41,3576	0 4202 0	ENTSET	TC	NVSLBEND	
2431	REF	216	LAST	455	41,3577	10 160 1	NVSUB2	CCS	MPAC +4	TEST VERR
2432					41,3578	0 3604 1	TC	+4		IF VERR NOT +0, GC ON
2433	REF	217	LAST	455	41,3579	3 0157 1	CA	MPAC	+3	

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2434	REF	2	LAST	441	41,3602	0 2321 0	TC	UPCATAN -1	IF VERB = +0, DISPLAY NOUN. THEN RETURN
2435	REF	3	LAST	455	41,3603	1 4202 0	TC	NVSUBEND	
2436	REF	218	LAST	455	41,3604	3 0156 0	CA	MPAC +2	TEMP FOR MACH CADR TO BE SPEC. (DSPDECVN
2437	REF	219	LAST	456	41,3605	54 161 0	TS	MFAC +5	USES MPAC, +1, +2)
2438	REF	220	LAST	456	41,3606	2 0160 0	CA	MFAC +4	
2439	REF	10	LAST	455	41,3607	0 2341 0	TC	UPCATVB -1	IF BOTH NOUN AND VERB ACT +0, DISPLAY
2440	REF	221	LAST	456	41,3610	3 0157 1	CA	MFAC +3	BOTH AND GO TO ENTPASO.
2441	REF	3	LAST	456	41,3611	0 2321 0	TC	UPCATAN -1	
2442	REF	98	LAST	455	41,3612	3 4755 1	CAF	ZEPC	
2443	REF	3	LAST	450	41,3613	55 013 0	TS	LOADSTAT	SET FOR WAITING FOR DATA CONDITION
2444	REF	13	LAST	455	41,3614	55 014 1	TS	CLPASS	
2445	REF	15	LAST	455	41,3615	55 012 1	TS	REGRET	SET REGRET FOR PASS 0.
2446	REF	222	LAST	456	41,3616	2 0161 1	CA	MPAC +5	RESTORES MACH CADR TO BE SPEC TO MFAC+2
2447	REF	223	LAST	456	41,3617	54 156 1	TS	MFAC +2	FOR USE IN INIMCTBS (IN ENTPASC).
2448	REF	3	LAST	407	41,3620	0 2035 0	ENDNVSBI TC	ENTPASO	

R2449 IF INTERNAL MACH CADR TO BE SPECIFIED, MPAC+2 WILL BE PLACED INTO
 R2450 NOUNCADR IN ENTPASC (INIMCTBS).

2451 REF 4 LAST 456 4204 SETLOC NVSUBEND +2
 24515 REF 4 LAST 454 TO 454: 24 48* COUNT* 11/PIN

A2452 FORCE BIT 15 OF MONSAVE1 TO 1.
 2453 REF 26 LAST 429 4204 3 4735 1 KILMONON CAF BIT15 THIS IS THE KILL MONITOR BIT.
 2454 REF 8 LAST 454 4205 55 020 0 TS MONSAVE1 TURN OFF BIT 14, THE EXTERNAL
 A2455 MONITOR BIT.

2458 REF 117 LAST 454 4206 0 0002 0 TC Q
 R2459 LOADSTAT +0 INACTIVE(WAITING FOR DATA). SET BY NVSUB
 R2460 +1 PROCEED NO DATA. SET BY SPECIAL VERB
 P2461 -1 TERMINATE SET BY SPECIAL VERB
 R2462 -0 DATA IN SET BY END OF LOAD ROUTINE
 R2463 OR RESEQUENCE SET BY VERB 32

R2464 L TO ENDIDLE (FIXED FIXED)
 R2465 ROUTINES THAT REQUEST LOADS THROUGH NVSUB SHOULD USE ENDIDLE WHILE
 R2466 WAITING FOR THE DATA TO BE LOADED. ENDIDLE PUTS CURRENT JOB TO SLEEP.
 R2467 ENDIDLE CANNOT BE CALLED FROM ERASABLE OR F/F MEMORY,
 R2468 SINCE JOBSLEEP AND JOBWAKE CAN HANDLE ONLY FIXED BANKS.
 R2469 RECALIST TESTS LOADSTAT AND WAKES JOB UP TO,
 R2470 L+1 FOR TERMINATE
 R2471 L+2 FOR PROCEED WITHOUT DATA
 R2472 L+3 FOR DATA IN, OR RESEQUENCE
 R2473 IT DOES NOTHING IF LOADSTAT INDICATES WAITING FOR DATA.

R2474 ENDIDLE ABORTS (WITH CODE 01206) IF A SECOND JOB ATTEMPTS TO GO TO SLEEP

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R2475 IN PINBALL. IN PARTICULAR, IF AN ATTEMPT IS MADE TO GO TO ENDIDLE WHEN
 R2476 1) CADDRSTOR NOT= +0. THIS IS THE CASE WHERE THE CAPACITY OF ENDIDLE IS
 R2477 EXCEEDED. (+NZ INDICATE A JOB IS ALREADY ASLEEP DUE TO ENDIDLE.)
 R2478 2) DSPLIST NOT= +0. THIS INDICATES A JOB IS ALREADY ASLEEP DUE TO
 R2479 NVSUBLSY.

2480	REF	118	LAST	456	4217	22	002	0	ENDIDLE	LXCH	0	RETURN ADDRESS INTO L.
2481	REF	1			4217	0	4220	0	TC	ISCADR+0		ABORT IF CADDRSTOR NOT= +0
2482	REF	1			4211	0	4224	1	TC	ISLIST+0		ABORT IF DSPLIST NOT= +0
2483	REF	59	LAST	442	4212	3	001	0	CA	L		CCNT SET DSPLCK TO 1 SO CAN USE
2484	REF	4	LAST	371	4213	7	5012	0	MASK	LCW10		ENDIDLE WITH NVSUB INITIATED MONITOR.
2485	REF	1			4214	6	004	0	AD	FRANK		SAME STRATEGY FOR CADR AS MAKECADR.
2486	REF	7	LAST	452	4215	55	041	1	TS	CADDRSTOR		
2487	REF	2	LAST	375	4216	0	5133	0	TC	JCPSLEEP		

2488	REF	57	LAST	452	4217	0	5155	0	ENDINST	TC	ENDCEJCB
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2489	REF	8	LAST	457	4220	11	041	1	ISCADR+0	CCS	CADDRSTOR	ABORTS (CODE 01206) IF CADDRSTOR NOT= +0.
2490	REF	1			4221	0	4227	1	TC	DSPABORT		RETURNS IF CADDRSTOR = +0.
2491	REF	119	LAST	457	4222	0	002	0	TC	0		
2492	REF	2	LAST	457	4223	0	4227	1	TC	DSPABORT		

2493	REF	2	LAST	223	4224	11	042	1	ISLIST+0	CCS	DSPLIST	ABORTS (CODE 01206) IF DSPLIST NOT= +0.
2494	REF	3	LAST	457	4225	0	4227	1	TC	DSPABORT		RETURNS IF DSPLIST = +0.
2495	REF	120	LAST	457	4226	0	002	0	TC	0		
2496	REF	1			4227	0	5624	1	DSPABORT	TC	BAILOUT	
2497					4230	31206	1		CCT	31206		

R2498 JANTERM ALLOWS PROGRAMS TO PERFORM THE TERMINATE FUNCTION.
 R2499 IT DOES ENDCEJCB.

2500	REF	3	LAST	454	4231	3	4201	0	JANTERM	CAF	PINSUBBT	
2501					4232	0	006	1	EXTEND			
25011	REF	6	LAST	454	4233	01	007	1	WRITE	SUPERBANK		
25012	REF	2	LAST	211	4234	3	4242	1	CAF	34DEC		
25013	REF	16	LAST	456	4235	55	012	1	TS	REQRET		LEAVE ENTER SET FOR ENTERPASS).
25012	REF	13	LAST	455	4236	4	4360	1	CS	VE1		
2503	REF	58	LAST	455	4237	54	776	0	TS	DSFCCNT		
2504	REF	32	LAST	452	4240	0	4635	0	TC	POSTJUMP		
2505	REF	2	LAST	410	4241	61	074	1	CADR	VBTERM		

2506					4242	00042	1	34DEC	DEC	34
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R2507 JAMPROC ALLOWS PROGRAMS TO PERFORM THE PROCEED/PROCEED WITHOUT DATA
 R2508 FUNCTION. IT DOES ENDCEJCB.

2509	REF	4	LAST	457	4243	3	4201	0	JAMPROC	CAF	PINSUBBT
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2510					4244	0 0006 1	EXTEND	
25101	REF	7	LAST	457	4245	01 017 1	WRITE	SUPERBNK
25102	REF	1			4246	3 4254 0	CAF	33DEC
25103	REF	17	LAST	457	4247	55 012 1	TS	RECRFT
2511	REF	14	LAST	457	4250	4 4361 1	CS	VC1
2512	REF	59	LAST	457	4251	54 776 0	TS	DSPCCUNT
2513	REF	33	LAST	457	4252	0 4635 0	TC	POSTJUMP
2514	REF	5	LAST	451	4253	61476 0	CADR	VEPRCC

2515					4254	00041 1	33DEC	DEC	33
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R2532 PLANKSLB PLANKS ANY COMBINATION OF R1, R2, R3.

R2533 CALL WITH BLANKING CODE IN A.

R2534 BIT1=1 BLANKS R1, BIT2=1 BLANKS R2, BIT3=1 BLANKS R3.

R2535 ANY COMBINATION OF THESE BITS IS ACCEPTED.

R2536 DSPCOUNT IS RESTORED TO STATE IT WAS IN BEFORE PLANKSLB WAS EXECUTED.

2538	REF	6	LAST	455	4255	7 4757 1	BLANKSUB	MASK	SEVEN	
2538I	REF	6	LAST	455	4256	54 123 0	TS	NVTEMP		STORE BLANKING CODE IN NVTEMP.
2539	REF	42	LAST	454	4257	3 4736 1	CAF	BIT14		
2540	REF	9	LAST	456	4260	7 1020 0	MASK	MONSAVF1		EXTERNAL MONITOR BIT
25401	REF	7	LAST	454	4261	6 1011 0	AD	DSPLOCK		
25402	REF	150	LAST	455	4262	10 001 0	CCS	A		
25403	REF	121	LAST	457	4263	0 0002 0	TC	Q		DSP SYST BLOCKED. RET TO 1+ CALLING LCC
25404	REF	122	LAST	456	4264	24 002 0	INCR	Q		DSP SYST AVAILABLE
A2541										SET RETURN FOR 2+ CALLING LCC

25411	REF	7	LAST	456	4265	10 123 0	CCS	NVTEMP		
25412					4266	1 4270 1	TCF	+2		
25413	REF	123	LAST	458	4267	0 0002 0	TC	Q		NOTHING TO BLANK. RET TO 2+ CALLING LCC
2542	REF	124	LAST	456	4270	22 002 0	LXCF	Q		SET RETURN FOR 2 + CALLING LCC
2544	REF	1			4271	3 4202 1	CAF	BLKBNK		

2545	REF	12	LAST	454	4272	56 006 1	XCF	BBANK		
25451					4273	0 0006 1	EXTEND			
25452	REF	8	LAST	456	4274	04 007 1	ROP	SUPERBNK		SAVE OLD SUPERBITS.
2546	REF	45	LAST	415	4275	52 131 0	CXCF	PUF		
25461	REF	5	LAST	457	4276	3 4201 0	CAF	PINSLPBT		
25462					4277	0 0006 1	EXTEND			
25463	REF	9	LAST	456	4300	01 017 1	WRITE	SUPERBNK		
2547	REF	1			4301	0 3550 1	TC	BLKSLBI		

2548	REF	60	LAST	456	4776		EBANK=	DSPCOUNT		
25481	REF	2	LAST	456	4302	60101 1	BLKRENK	BECCN	PLANKSLBI	
2549					4303		FNDBLFF	EQUALS		

2550	REF	1			40,3550		SETLCC	ENDPELCS		
25505	REF	8	LAST	450 TO	454:	42	809*	CCUNT*	\$/PIN	
2551	REF	61	LAST	458	40,3551	3 7776 1	BLKSUBI	CA	DSPCCUNT	SAVE OLD DSPCCUNT FOR LATER RESTORATION
25511	REF	46	LAST	456	40,3551	54 132 0	TS	PLF	+2	

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25512	REF	23	LAST	450	40,3552	3 4753 1	CAF	BIT1	TEST BIT1. SEE IF R1 TO BE BLANKED.
2552	REF	1			40,3553	0 3572 1	TC	TESTBIT	
2553	REF	12	LAST	442	40,3554	3 4217 0	CAF	R1D1	
2554	REF	4	LAST	422	40,3555	0 2535 0	TC	5BLANK -1	
2555	REF	25	LAST	434	40,3556	3 4752 0	CAF	BIT2	TEST BIT 2. SEE IF R2 TO BE BLANKED.
2556	REF	2	LAST	459	40,3557	0 3572 1	TC	TESTBIT	
2557	REF	5	LAST	444	40,3560	3 4320 1	CAF	R2C1	
2558	REF	5	LAST	459	40,3561	0 2535 0	TC	5BLANK -1	
2559	REF	23	LAST	452	40,3562	3 4751 0	CAF	BIT3	TEST BIT3. SEE IF R3 TO BE BLANKED.
2560	REF	3	LAST	459	40,3563	0 3572 1	TC	TESTBIT	
2561	REF	5	LAST	423	40,3564	3 4321 0	CAF	R3D1	
2562	REF	6	LAST	459	40,3565	0 2535 0	TC	5BLANK -1	
2563	REF	47	LAST	455	40,3566	3 0132 1	CA	RUF +2	RESTORE DSPCOUNT TO STATE IT HAD
2564	REF	62	LAST	458	40,3567	54 776 0	TS	DSPCOUNT	BEFORE BLANKSUP.
2565	REF	48	LAST	459	40,3570	52 131 0	EXCH	RUF	CALL L+2 DIRECTLY.
2566	REF	3	LAST	454	40,3571	0 5166 0	TC	SLDPCXCHZ +1	OTCB WITH SUPERBIT SWITCHING
2567	REF	8	LAST	458	40,3572	7 0123 0	TESTPIT	MASK	NVTEMP
2568	REF	151	LAST	458	40,3573	10 000 0	LCS	A	NVTEMP CONTAINS BLANKING CODE.
2569	REF	125	LAST	458	40,3574	0 0102 0	TC	Q	IF CURRENT BIT = 1, RETURN TO L+1.
2570	REF	126	LAST	459	40,3575	50 002 0	INDEX	Q	IF CURRENT BIT = 0, RETURN TO L+3.
2571					40,3576	0 0002 0	TC	2	
2572					40,3577		FNDCBSUR1	EQUALS	

R257205 DSPMM DOES NOT DISPLAY MCODEG DIRECTLY. IT PUTS IN EXEC REQUEST WITH R257206 PRIQ 37000 FOR DSPMMJB AND RETURNS TO CALLER.

R257207 IF MCODEG CONTAINS -0, DSPMMJB BLANKS THE MCODE LIGHTS.

R257209 DSPMM MUST BE IN BANK 27 OR LOWER, SO IT CAN BE CALLED VIA BANKCALL.

25721					07,2667		BANK	7	
257215	REF	1			04,2610		SETLCC	PINBALL4	
257217					04,2620		BANK		
257218	REF	1					COUNT*	\$1/PIN	
25722	REF	127	LAST	459	04,2620	56 002 0	DSPMM	XCH	Q
25723	REF	224	LAST	456	04,2621	54 154 0	TS	MPAC	
25724					04,2622	0 0004 0	ININT		
25725	REF	3	LAST	440	04,2623	3 4355 0	CAF	CHEPRIC	
25726	REF	6	LAST	440	04,2624	0 5172 1	TC	NOVAC	
25727	REF	62	LAST	459	0776		FRANK=	DSPCOUNT	
25728	REF	1			04,2625	0 2577 1	2CADR	DSPMMJB	
25728	REF	1			04,2626	6 0101 1			
257285					04,2627	0 0003 1	REFLINT		
25729	REF	225	LAST	459	04,2630	0 0154 1	FNDCSPMM	TC	MPAC

R2573 DSPMM PLACE MAJOR MCODE CODE INTO MCODEG

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25735 REF 1 40,3577 SFTLOC ENDBSLB1

25736 REF 9 LAST 458 TC 459: 23 832* CCUNT* \$1/PIN

2574 REF 1 40,3577 3 4262 1 DSPMMJR CAF MD1 GETS HERE THRU DSPMM

2575 REF 64 LAST 459 40,3610 56 776 1 XCF DSPCOUNT

2576 REF 1 40,3611 54 140 0 TS DSPMMTEM SAVE DSPCOUNT

2579 REF 7 LAST 264 40,3612 11 010 0 CCS MODREG

2580 REF 56 LAST 454 40,3613 6 4753 1 AD CNF

25801 REF 4 LAST 445 40,3614 0 3242 1 TC DSPDECVN IF MODREG IS + CR +0, DISPLAY MODREG

25802 40,3615 1 3607 0 TC +2 IF MODREG IS -KZ, DO NOTHING

25803 REF 6 LAST 449 40,3616 0 2601 1 TC 2 BLANK IF MODREG IS -0, BLANK MM

2581 REF 2 LAST 461 40,3617 56 141 1 XCH DSPMMTEM RESTORE DSPCOUNT

2582 REF 65 LAST 460 40,3618 54 776 0 TS DSPCOUNT

2583 REF 58 LAST 457 40,3611 1 5155 0 TC ENDDFJCE

R2584 RECALIST IS ENTERED DIRECTLY AFTER DATA IS LOADED (OR RESEQUENCE VERB IS

R2585 EXECUTED), TERMINATE VERB IS EXECUTED, OR PROCEED WITHOUT DATA VERB IS

R2586 EXECUTED. IT WAKES UP JOB THAT DID TC ENDDLE.

R2587 IF CADRSTOR NOT= +0, IT PUTS +0 INTO DSPLOCK, AND TURNS OFF KEY RLSE

R2588 LIGHT IF DSPLIST IS EMPTY (LEAVES KEY RLSE LIGHT ALONE IF NOT EMPTY).

2589 REF 9 LAST 457 40,3612 11 041 1 RECALIST CCS CADRSTOR

2590 REF 1 40,3613 0 3615 0 TC RECAL1

2591 REF 59 LAST 460 40,3614 0 5155 0 TC ENDDFJCE

2592 REF 99 LAST 456 40,3615 3 4755 1 RECAL1 CAF ZERO NORMAL EXIT IF KEYBOARD INITIATED

2593 REF 10 LAST 460 40,3616 57 041 0 XCF CADRSTOR

2594 40,3617 0 0 04 0 INHINT

2595 REF 3 LAST 375 40,3620 0 5137 1 TC JOBWAKE

2596 REF 4 LAST 456 40,3621 11 013 0 CCS LEADSTAT

2597 REF 1 40,3622 0 3644 1 TC DCPROC

2598 REF 60 LAST 460 40,3623 0 5155 0 TC ENDDFJCE + PROCEED WITHOUT DATA

2599 REF 1 40,3624 0 3642 1 TC DCTERM - TERMINATE

2600 REF 31 LAST 447 40,3625 3 4752 0 CAF TWO -0 DATA IN CR RESEQUENCE

2601 REF 2 LAST 373 40,3626 50 064 0 RECAL2 INDEX LCCCTR

2602 REF 3 LAST 373 40,3627 6 0164 1 AD LCC

2603 REF 3 LAST 460 40,3630 50 064 0 INDEX LCCCTR LCC IS + FOR BASIC JOBS

2604 REF 4 LAST 460 40,3631 54 164 0 TS LCC

26041 REF 15 LAST 455 40,3632 3 1001 1 CA ACUNREG

26042 REF 60 LAST 457 40,3633 54 001 1 TS L

26043 REF 21 LAST 455 40,3634 3 1001 0 CA VERBREG SAVE VERB IN MPAC, ACUN IN MPAC+1 AT

26044 REF 4 LAST 460 40,3635 50 064 0 INDEX LCCCTR TIME OF RESPONSE TO ENDDLE FOR

26045 REF 226 LAST 459 40,3636 52 155 1 XCF MPAC POSSIBLE LATER TESTING BY JOE THAT HAS

2605 40,3637 3 0002 1 RELINT BEEN WAKED UP.

2606 REF 9 LAST 452 40,3640 0 4457 0 RECAL3 TC RELDSP

2607 REF 61 LAST 460 40,3641 0 5155 0 TC ENDDFJCE

2608 REF 100 LAST 460 40,3642 3 4755 1 DCTERM CAF ZERO

2609 REF 1 40,3643 0 3626 0 TC RECAL2

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2611	REF	57	LAST	461	40,3644	3 4753 1	DCPRCC	CAP	ONE
2611	REF	2	LAST	461	40,3645	0 3626 0	TC	RECAL2	

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P2612 MISCELLANEOUS SERVICE ROUTINES IN FIXED/FIXED

2613 REF 1 4313 SETLOC ENCBLEFF

26135 REF 5 LAST 456 TO 458: 63 111* CCUNT* \$1/PIN

R2614 SETNCADR E CADR ADDRESS IN A. IT IS STORED IN NCUNCADR. EBANK BITS
 R2615 ARE SET. E ADRES IS DERIVED AND PUT INTO NCUNADD.

2616	REF	8	LAST	442	4302	55 016 0	SETNCADR	TS	NCUNCADR	STORE ECADR
2617	REF	13	LAST	389	4304	54 013 0		TS	EBANK	SET EBANK BITS
2618	REF	2	LAST	192	4305	7 4357 0		MASK	LCW8	
2619	REF	1			4306	6 5007 0		AD	OCT1400	
2620	REF	29	LAST	437	4317	54 145 0		TS	NCUNADD	PUT E ADRES INTO NCUNADD
2621	REF	128	LAST	455	4310	0 0002 0		TC	Q	

R2622 SETNADD GETS E CADR FROM NCUNCADR, SETS EBANK BITS, DERIVES
 R2623 E ADRES AND PUTS IT INTO NCUNADD.

2624	REF	9	LAST	462	4311	3 1016 1	SETNADD	CA	NCUNCADR	
2625	REF	7	LAST	431	4312	1 4304 0		TCF	SETNCADR +1	

R2626 SETEBANK E CADR ADDRESS IN A. EBANK BITS ARE SET. E ADRES IS
 R2627 DERIVED AND LEFT IN A.

2628	REF	14	LAST	462	4313	54 013 0	SETEBANK	TS	EBANK	SET EBANK BITS
2629	REF	3	LAST	462	4314	7 4357 0		MASK	LCW8	
2630	REF	2	LAST	462	4315	6 5117 0		AD	OCT1400	E ADRES LEFT IN A
2631	REF	129	LAST	462	4316	0 0002 0		TC	Q	

2632					4317	00016 0	R101	OCT	16	THESE 3 CONSTANTS FORM A PACKED TABLE. DO NOT SEPARATE.
2633					4320	00011 1	R201	OCT	11	
2634					4321	00004 0	R301	OCT	4	

2635	REF	7	LAST	446	4322	54 020 1	RIGHT5	TS	CYR	
2636	REF	8	LAST	462	4323	4 0121 1		CS	CYR	
2637	REF	9	LAST	462	4324	4 0020 1		CS	CYR	
2638	REF	10	LAST	462	4325	4 0020 1		CS	CYR	
2639	REF	11	LAST	462	4326	4 0020 1		CS	CYR	
2640	REF	12	LAST	462	4327	56 020 0		XCF	CYR	
2641	REF	130	LAST	462	4330	0 0002 0		TC	Q	

2642	REF	13	LAST	446	4331	54 022 0	LEFT5	TS	CYL	
2643	REF	14	LAST	462	4332	4 0022 0		CS	CYL	
2644	REF	15	LAST	462	4333	4 0022 0		CS	CYL	
2645	REF	16	LAST	462	4334	4 0022 0		CS	CYL	
2646	REF	17	LAST	462	4335	4 0022 0		CS	CYL	

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2647	REF	18	LAST	462	4336	56 022	1		XCH	CYL
2648	REF	141	LAST	462	4337	0 0002	0		TC	Q

2649					4340	6 0000	1	SLEFT5	DCURLE	
2650					4341	6 0000	1		DCURLE	
2651					4342	6 0000	1		DOUBLE	
2652					4343	6 0000	1		DCURLE	
2653					4344	6 0000	1		DCURLE	
2654	REF	132	LAST	463	4345	0 0002	0		TC	Q

2655					4346	00037	0	LCW5	CCT	37	THESE 3 CONSTANTS FORM A PACKED TABLE.
2656					4347	01740	0	MIC5	CCT	1740	CCNT SEPARATE.
2657					4350	76000	0	HIS	CCT	76000	MUST STAY HERE

2658	REF	7	LAST	459	4351	0 5072	1	TCNOVAC	TC	NOVAC
2659	REF	17	LAST	440	4352	0 5203	0	TCWAIT	TC	WAITLIST
2660	REF	12	LAST	440	4353	0 5261	1	TCISKCLR	TC	TASKOVER
2661	REF	16	LAST	385	4354	0 5195	0	TCFINVC	TC	FINDVAC

2662					4355	30000	1	CHPPRIC	CCT	30000	EXEC PRIORITY OF CHARIN
------	--	--	--	--	------	-------	---	---------	-----	-------	-------------------------

2663					4356	03777	0	LCW11	CCT	3777
2664	REF	6	LAST	431	4356			P12-1	EQUALS	LCW11
2665					4357	03777	1	LCW8	CCT	377

2667					4360	00023	0	VD1	CCT	23	THESE 3 CONSTANTS FORM A PACKED TABLE.
2668					4361	00021	1	ND1	CCT	21	CCNT SEPARATE.
2669					4362	00025	0	ND1	CCT	25	

2670					4363	00012	1	BINCON	CFC	10
------	--	--	--	--	------	-------	---	--------	-----	----

2671	REF	19	LAST	406	4364	3 4745	0	FALTCN	CA	BIT7	TURN ON OPERATOR ERROR LIGHT
2672					4365	0 0006	1		EXTEND		
2673	REF	12	LAST	452	4366	05 011	1		WOR	DSALMOUT	BIT 7 OF CHANNEL 11
2674	REF	133	LAST	463	4367	0 0002	0		TC	Q	

2675	REF	20	LAST	463	4370	4 4745	1	FALTCE	CS	BIT7	TURN OFF OPERATOR ERROR LIGHT
2676					4371	0 0006	1		EXTEND		
2677	REF	13	LAST	463	4372	03 011	1		WAMP	DSALMOUT	BIT 7 OF CHANNEL 11
2678	REF	134	LAST	463	4373	0 0002	0		TC	Q	

2679	REF	24	LAST	449	4374	3 4747	1	RELSEPCN	CAF	BIT5	TURN ON KEY RELEASE LIGHT
2680					4375	0 0006	1		EXTEND		
2681	REF	14	LAST	463	4376	05 011	1		WOR	DSALMOUT	BIT 5 OF CHANNEL 11
2682	REF	135	LAST	463	4377	0 0002	0		TC	Q	

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2683				4400	0 0006 1	LCCSAMP	EXTEND		
2684	REF	13	LAST	367	4411	3 0025 0		DCA	TIME2
2685	REF	5	LAST	316	4412	52 014 0		DXCH	SAMPTIME
2686	REF	136	LAST	463	4413	0 0002 0		TC	Q

2687				4414	0 0016 1	TPSL1	EXTEND			SHIFTS MPAC, +1, +2 LEFT 1
2688	REF	227	LAST	460	4415	3 0155 0		DCA	MPAC	+1
2689	REF	228	LAST	464	4416	20 156 1		DAS	MPAC	+1
2690	REF	229	LAST	464	4417	6 0154 1		AD	MPAC	
2691	REF	230	LAST	464	4418	26 154 0		ACS	MPAC	
2692				4411	54 007 1		TS	7		TS A DCS NOT CHANGE A CN CF/LF.
2693	REF	137	LAST	464	4412	0 0012 0		TC	Q	NO NET CF/LF
2694	REF	7	LAST	436	4413	54 162 0		TS	MPAC+6	MPAC +6 SET TC +/-1 FOR CF/LF
2695	REF	138	LAST	464	4414	0 0002 0		TC	Q	

R2696 IF MPAC, +1 ARE EACH +NZ OR +0 AND C(A)=-0, SHORTMP WRONGLY GIVES +0.

R2697 IF MPAC, +1 ARE EACH -NZ OR -0 AND C(A)=+0, SHORTMP WRONGLY GIVES +0.

R2698 PPSHRTMP FIXES FIRST CASE ONLY, BY MERELY TESTING C(A) AND IF IT = -0,

R2699 SETTING RESULT TC -0.

R2700 (DO NOT USE PPSHRTMP UNLESS MPAC, +1 ARE EACH +NZ OR +0, AS THEY ARE

R2701 WHEN THEY CONTAIN THE SE CONSTANTS.)

2702	REF	2	LAST	97	4415	54 135 1	PPSHRTMP	TS	MPTEMP	
2703	REF	152	LAST	459	4416	10 000 0		CCS	A	
2704	REF	3	LAST	464	4417	3 0135 0		CA	MPTEMP	C(A) +, DO REGULAR SHORTMP
2705	REF	6	LAST	443	4420	1 7213 0		TCF	SHORTMP +1	C(A) +0, DO REGULAR SHORTMP
2706				4421	1 4417 0			TCF	-2	C(A) -, DO REGULAR SHORTMP
2707	REF	101	LAST	460	4422	4 4755 0		CS	ZERC	C(A) -0, FORCE RESULT TC -0 AND RETURN.
2708	REF	231	LAST	464	4423	54 154 0		TS	MPAC	
2709	REF	232	LAST	464	4424	54 155 1		TS	MPAC	+1
2710	REF	233	LAST	464	4425	54 156 1		TS	MPAC	+2
2711	REF	139	LAST	464	4426	0 0002 0		TC	Q	

2712	REF	36	LAST	327	4427	3 4746 0	FLASHON	CAF	BIT6	TURN ON V/N FLASH
2713				4430	0 0006 1			EXTEND		BIT 6 OF CHANNEL 11
2714	REF	15	LAST	463	4431	05 011 1		WDR	DSALMOUT	
2715	REF	140	LAST	464	4432	0 0002 0		TC	Q	

2716	REF	37	LAST	464	4433	4 4746 1	FLASHOFF	CS	BIT6	TURN OFF V/N FLASH
2717				4434	0 0006 1			EXTEND		
2718	REF	16	LAST	464	4435	03 011 1		WAND	DSALMOUT	BIT 6 OF CHANNEL 11
2719	REF	141	LAST	464	4436	0 0002 0		TC	Q	

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P2720 INTERNAL USE OF KEYBOARD AND DISPLAY PROGRAM

R2721 USER MUST SCHEDULE CALLS TO NVSUB SO THAT THERE IS NO CONFLICT OF USE OR
R2722 CONFLUSION TO OPERATOR. THE OLD GRARLOCK (INTERNAL/INTERNAL INTERLOCK)
R2723 HAS BEEN REMOVED AND THE INTERNAL USER NO LONGER HAS THE PROTECTION THIS
R2724 OFFERED.

P2725 THERE ARE TWO WAYS A JOB CAN BE PUT TO SLEEP BY THE KEYBOARD + DISPLAY

PROGRAM. 1) BY ENIGLE

R2727 2) BY NVSLRUSY

R2728 THE BASIC CONVENTION IS THAT ONLY ONE JOB WILL BE PERMITTED ASLEEP VIA

R2729 THE KEYBOARD + DISPLAY PROGRAM AT A TIME. IF A JOB ATTEMPTS TO GO TO

R2730 SLEEP BY MEANS OF (1) OR (2) AND THERE IS ALREADY A JOB ASLEEP THAT WAS

R2731 PUT TO SLEEP BY (1) OR (2), THEN AN ABORT IS CAUSED.

R2732 THE CALLING SEQUENCE FOR NVSUB IS

R2733 CAF V/M

R2734 L TC NVSUB

R2735 L+1 RETURN HERE IF OPERATOR HAS INTERVENED

R2736 L+2 RETURN HERE AFTER EXECUTION

R2737 A ROUTINE CALLED NVSUBUSY IS PROVIDED (USE IS OPTIONAL) TO PUT

R2738 YOUR JOB TO SLEEP UNTIL THE OPERATOR RELEASES THE KEYBOARD + DISPLAY

R2739 SYSTEM. NVSUBUSY ALSO TURNS ON THE KEY RELEASE LIGHT.

R2740 NVSLRUSY CANNOT BE CALLED FROM ERASABLE OR P/P MEMORY,

R2741 SINCE JOBSLEEP AND JOBWAKE CAN HANDLE ONLY FIXED BANKS.

R2742 THE CALLING SEQUENCE IS

R2743 CAF WAKEPCADR

R2744 TC NVSUBUSY

R2745 .

R2746 NVSUBUSY IS INTENDED FOR USE WHEN AN INTERNAL PROGRAM FINDS THE OPERATOR

R2747 IS USING THE KEYBOARD + DISPLAY PROGRAM (BY HIS OWN INITIATION). IT IS

R2748 NOT INTENDED FOR USE WHEN ONE INTERNAL PROGRAM FINDS ANOTHER INTERNAL

R2749 PROGRAM USING THE KEYBOARD + DISPLAY PROGRAM.

R2750 NVSLRUSY ABORTS (WITH CODE #1206) IF A SECOND JOB ATTEMPTS TO GO TO

R2751 SLEEP IN PINBALL. IN PARTICULAR, IF AN ATTEMPT IS MADE TO GO TO NVSLRUSY

R2752 WHEN

R2753 1) DSPLIST NOT= +C. THIS IS THE CASE WHERE THE CAPACITY OF THE DSPLIST

R2754 IS EXCEEDED.

R2755 2) CAFEETER NOT= +C. THIS INDICATES THAT A JOB IS ALREADY USING

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P2754 ENDICLF. (+NZ INDICATE A JOB IS ALREADY ASLEEP DUE TO ENDICLF.)

2757	RFF	1		4437	4 4444 0	PRENVESY CS	2K+3		SPECIAL ENTRANCE FOR ROUTINES IN FIXED
2758	RFF	142	LAST	464	4440 6 0002 0	AD	G		BANKS ONLY DESIRING THE FCACR CF(LCC
2759	RFF	2	LAST	457	4441 6 0004 0	AD	FBANK		FROM WHICH THE TC PRENVESY WAS CCNE) -2
2760	RFF	34	LAST	458	4442 0 4635 0	NVSUBLSY TC	PCSTJUMP		TO BE ENTERED.
2761	RFF	1		4443	17631 1	CACR	NVSUBSY1		
2762				4444	02003 0	2K+3	CCT	2003	

R2762 NVSUBSY1 MUST BE IN BANK 27 OR LOWER, SO IT WILL PUT CALLER TO SLEEP
 R27626 WITH HIS PROPER SUPERBITS.

2763	RFF	1		04,2631			SETLCC FNDSPMM +1		
27635	RFF	2	LAST	459 TO	460:	9	S*	CCUNT* \$4/PIN	
2764	RFF	61	LAST	460	04,2631	54 001 1	NVSUBSY1 TS	L	
2765	RFF	2	LAST	457	04,2632	0 4220 0	TC	ISACR+0	ABORT IF CACRSTOR NOT= +0.
2770	RFF	2	LAST	457	04,2632	0 4224 1	TC	ISL1ST+0	ABORT IF DSPL1ST ACT= +0.
2771	RFF	3	LAST	441	04,2634	0 4374 0	TC	RELDSPCN	
2772	RFF	62	LAST	466	04,2635	3 0001 0	CA	L	
2773	RFF	3	LAST	457	04,2636	55 0042 1	TS	DSPL1ST	
2774	RFF	3	LAST	457	04,2637	0 5133 0	ENDNVRSY TC	JCRSLEEP	

R2775 NVSWAIT IS A SPECIAL ENTRANCE FOR ROUTINES IN FIXED BANKS ONLY. IF
 R2776 SYSTEM IS NOT BUSY, IT EXECUTES V/N AND RETURNS TO L+1 (L= LCC FROM
 R2777 WHICH THE TC NVSWAIT WAS CCNE). IF SYSTEM IS BUSY, IT PUTS CALLING JOB
 R2778 TO SLEEP WITH L-1 GOING INTO LIST FOR EVENTUAL WAKING UP WHEN SYSTEM
 R2779 IS NOT BUSY.

2780	RFF	1		4445			SETLCC NVSUBLSY +3		
27805	RFF	6	LAST	462 TO	466:	98	209*	COUNT* \$\$/PIN	
2781					4445	22 007 0	NVSWAIT	LXCH 7	ZERO NVMONCPT OPTIONS
2782	RFF	9	LAST	459	4446	54 123 0	TS	NVTFMP	
2783	RFF	44	LAST	458	4447	3 4736 1	CAF	BIT14	
27831	RFF	10	LAST	458	4450	7 1020 0	MASK	MCNSAVE1	EXTERNAL MONITOR BIT
27832	RFF	8	LAST	458	4451	6 1011 0	AD	DSPLCCK	
27833	RFF	153	LAST	464	4452	10 000 0	CCS	A	
27834	RFF	1			4453	1 4455 0	TCF	NVSBWT1	BUSY
2784	RFF	1			4454	1 4164 1	TCF	NVSBCCM	FREE. NVSWP WILL SAVE L+1 FOR RETURN
A2785									AFTER EXECUTION.
2786	RFF	143	LAST	466	4455	24 002 0	NVSBWT1	INCP C	L+2. PRENVRSY WILL PUT L-1 INTO LIST AND
2787	RFF	1			4456	1 4437 1	TCF	PRENVRSY	GO TO SLEEP.

R2788 RELDSP IS USED BY VREKOC, VTERM, VPRGEXEC, VERGWAIT, VERELESF, EXTENDED

R2789 VERE DISPATCHER, VERESFC, RECALST.

R2790 RELDSP1 IS USED BY MONITOR SET UP, VERELESF.

2791	RFF	144	LAST	466	4457	56 002 0	RELDSP	XCH C	SFT DSPLCCK TO +0, TURN RELDSP LIGHT
2792	RFF	1			4461	54 144 1	TS	RELRET	OFF, SEARCH DSPL1ST
27921	RFF	45	LAST	466	4461	4 4736 0	CS	BIT14	

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27922					4462	0 0004 0		INHINT		
27923	REF	11	LAST	466	4463	7 1020 0		MASK	MCNSAVE1	
27924	REF	12	LAST	467	4464	55 020 0		TS	MCNSAVE1	TURN OFF EXTERNAL MCNITCR BIT
2793	REF	4	LAST	466	4465	11 042 1		CCS	DSPLIST	
2794					4466	0 4470 0		TC	+2	
2795	REF	1			4467	0 4472 0		TC	RELDSP2	LIST EMPTY
2796	REF	102	LAST	464	4470	3 4755 1		CAF	ZFFC	
2797	REF	5	LAST	467	4471	57 042 0		XCH	DSPLIST	
2799	REF	4	LAST	460	4472	0 5137 1		TC	JCBWAKE	
2800					4473	0 0003 1	RELDSP2	REFLINT		
2801	REF	25	LAST	463	4474	4 4747 0		CS	BITS	TURN OFF KEY RELEASE LIGHT
2802					4475	0 0006 1		EXTEND		(BIT 5 OF CHANNEL 11)
2803	REF	17	LAST	464	4476	03 011 1		WAND	DSALMCUT	
2804	REF	103	LAST	467	4477	3 4755 1		CAF	ZFC	
2805	REF	5	LAST	466	4500	55 011 1		TS	DSPLCCK	
2807	REF	2	LAST	466	4501	0 0144 0		TC	RELRET	
2808	REF	145	LAST	466	4502	55 002 0	RELDSP1	XCH	Q	SET DSPLCCK TO +0. NO DSPLIST SEARCH.
2809	REF	3	LAST	467	4503	54 144 1		TS	RELRET	TURN KEY RLSE LIGHT OFF IF DSPLIST IS
A2810										EMPTY. LEAVE KEY RLSE LIGHT ALONE IF
A2811										DSPLIST IS NOT EMPTY.
2812	REF	6	LAST	467	4504	11 042 1		CCS	DSPLIST	
2813					4505	0 4507 1		TC	+2	+ NOT EMPTY. LEAVE KEY RLSE LIGHT ALONE
2814	REF	2	LAST	467	4506	0 4473 0		TC	RELDSP2	+0 EMPTY. TURN OFF KEY RLSE LIGHT
2815	REF	104	LAST	467	4507	3 4755 1		CAF	ZERC	- NOT EMPTY. LEAVE KEY RLSE LIGHT ALONE
2816	REF	10	LAST	467	4510	55 011 1		TS	DSPLCCK	
2817	REF	4	LAST	467	4511	0 0144 0		TC	RELRET	

2818

4512

ENDPINBF FOLALS

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P28181 PINTEST IS NEEDED FOR AUTO CHECK OF PINBALL.

28182 RFF 2 LAST 262 43,2132

PINTEST EQUALS LST2FAN

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P2819 VBTSTLTS TURNS ON ALL DISPLAY PANEL LIGHTS. AFTER 5 SEC, IT TURNS
 R2821 OFF THE CAUTION AND STATUS LIGHTS.

2821	REF	1		41,2621		SFTLCC ENDNVSB1 +1	
28215	REF	8	LAST	454 TO 456:	61 913*	CCUNT* \$\$/PIN	
2822				41,3621	0 0004 0	VBTSTLTS INHINT	
28222	REF	55	LAST	449	41,3622 0 4616 1	TC BANKCALL	OPP ERR IF ACT IN PDC
28224	REF	6	LAST	291	41,3623 66117 0	2CADR CHKPCEH	
2823	REF	24	LAST	459	41,3624 4 4753 0	CS BIT1	SFT BIT 1 OF 14CODES33 SC IMCMCN WONT
2824	REF	19	LAST	223	41,3625 7 1300 1	MASK 14CODES33	TURN OUT ANY LAMPS.
2825	REF	25	LAST	469	41,3626 6 4753 1	AD 9171	
2826	REF	21	LAST	469	41,3627 551330 1	TS 14CODES33	
2827	REF	1		41,3630	3 3667 0	CAF TSTCCN1	TURN ON UPLINK ACTIVITY, TEMP, KEY RLSE,
2828				41,3631	0 0006 1	EXTEND	V/N FLASH, OPERATER EPPCR.
2829	REF	18	LAST	467	41,3632 05 011 1	WCR PSALMCUT	
2830	REF	1		41,3633	3 3670 0	CAF TSTCCN2	TURN ON NO ATT, GIMBAL LOCK, TRACKER,
2831	REF	27	LAST	455	41,3634 551135 1	TS DSPTAR +110	PPCG ALM.
28311	REF	1		41,3635	0 6022 1	TC C13STALL	
2832	REF	21	LAST	419	41,3636 3 4742 1	CAF BIT10	TUPN CN TEST ALARM CUTEIT
2833				41,3637	0 0006 1	EXTEND	
2834	REF	5	LAST	221	41,3640 05 013 0	WCR CHAN13	
2835	REF	5	LAST	401	41,3641 3 4363 0	CAF TEN	
2836	REF	1		41,3642	54 117 1	TSTLTS1 TS FRONT	
2837	REF	1		41,3643	4 3665 0	CS FULLDSP	
2838	REF	2	LAST	469	41,3644 51 117 0	INDEX FRONT	
2839	REF	28	LAST	469	41,3645 551022 1	TS PSPTAB	
2840	REF	3	LAST	469	41,3646 10 117 1	CCS FRONT	
2841	REF	1		41,3647	0 3642 1	TC TSTLTS1	
2842	REF	1		41,3650	4 3666 0	CS FULLDSP1	
2843	REF	29	LAST	469	41,3651 551123 1	TS DSPTAR +1	TURN ON 3 PLUS SIGNS
2844	REF	31	LAST	469	41,3652 551026 0	TS PSPTAB +4	
2845	REF	31	LAST	469	41,3653 551030 1	TS DSPTAB +6	
2846	REF	1		41,3654	3 4760 1	CAF ELEVEN	
2847	REF	9	LAST	455	41,3655 551015 0	TS NCUT	
2848				41,3656	0 0003 1	REFLINT	
2849	REF	1		41,3657	3 3672 1	CAF SHOLTS	
2850				41,3660	0 0004 0	INHINT	
2851	REF	18	LAST	463	41,3661 0 5203 0	TC WAITLIST	
2852	REF	32	LAST	469	1122	ERANK= DSPTAB	
2853	REF	1		41,3662	02673 0	2CADR TSTLTS2	
2853	REF	1		41,3663	62102 0		
2854	REF	62	LAST	460	41,3664 0 5155 0	TC ENDCFJOB	DSFLOCK IS LEFT BUSY (FROM KEYBOARD ACTION) UNTIL TSTLTS3 TO INSURE THAT LIGHTS TEST WILL BE SFEN.
A2855							
A2856							
2857				41,3665	05675 0	FULLDSP CCT	15675 DISPLAY ALL 8:S
2858				41,3666	07675 1	FULLDSP1 CCT	07675 DISPLAY ALL 8:S AND +

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2859 41,3667 00175 1 TSTCCN1 CCT 00175

A2860

A2861

UPLINK ACTIVITY, TEMP, KEY RISE,
V/N FLASH, OPERATOR ERROR.

2862 41,3670 40674 0 TSTCCN2 CCT 40674

A2863

2864

DSFTAB+110 BITS 3,4,5,6,8,9. LR LITES,
NO ATT, GIMBAL LOCK, TRACKER, PROG ALM.
CHAN 11 BITS 1, 2, 4, 7.

A2865 41,3671 00115 1 TSTCCN3 CCT 00115

2866

UPLINK ACTIVITY, TEMP, OPERATOR ERROR.
5 SEC

2867 REF 4 LAST 459 41,3673 3 4355 0 TSTLTS2 CAF CRRPIC

2868 REF 8 LAST 463 41,3674 0 5072 1 TC NCVAC

CALLED BY WAITLIST

2869 REF 32 LAST 465 1022 FBANK= DSFTAB

2870 REF 1 41,3675 03700 0 20ADR TSTLTS3

2871 REF 1 41,3676 62102 0 TC TASKOVER

2872 REF 1 41,3700 4 3671 0 TSTLTS3 CS TSTCCN3

2873 41,3701 0 0004 0 INHINT

2874 41,3702 0 0006 1 EXTEND

CALLED BY EXECUTIVE

2875 REF 19 LAST 469 41,3703 03 011 1 WAND DSALMOUT

2875 REF 2 LAST 469 41,3704 0 6022 1 TC C13STALL

2876 REF 22 LAST 469 41,3705 4 4742 0 CS BIT10

TURN OFF UPLINK ACTIVITY, TEMP,
OPERATOR ERROR.

2877 41,3706 0 0006 1 EXTEND

2878 REF 6 LAST 469 41,3707 03 013 0 WAND CHAN13

2878 REF 21 LAST 333 41,3710 3 4750 1 CAF BIT4

TURN OFF TEST ALARM OUTBIT

28782 41,3711 0 0006 1 EXTEND

28783 REF 23 LAST 289 41,3712 02 012 0 RAND CHAN12

2879 REF 27 LAST 456 41,3713 6 4735 1 AC BIT15

2880 REF 24 LAST 470 41,3714 55 1235 1 TS DSPTAB +110

2881 REF 1 41,3715 4 3740 0 CS 13-11,1

2882 REF 21 LAST 460 41,3716 7 1300 1 MASK IMODES23

2883 REF 3 LAST 224 41,3717 6 5026 0 AD PFIC16

2884 REF 22 LAST 470 41,3720 55 1300 1 TS IMODES33

MAKE NO ATT FOLLOW BIT 4 OF CHANNEL 12

(NO ATT LIGHT ON IF IN COARSE ALIGN)

2885 REF 1 41,3721 4 3742 1 CS CCT55000

2886 REF 42 LAST 228 41,3722 7 1277 0 MASK IMODES30

2887 REF 4 LAST 260 41,3723 6 5025 0 AC PRI015

2888 REF 43 LAST 470 41,3724 55 1277 0 TS IMODES30

15000.

2889 REF 1 41,3725 4 3740 1 CS RFAILS2

2890 REF 28 LAST 419 41,3726 7 0110 0 MASK RADMCDES

2891 REF 3 LAST 185 41,3727 6 4745 0 AD RCRUFFIT

2892 REF 29 LAST 470 41,3730 54 110 0 TS RADMCDES

2893 41,3731 0 0003 1 RELINT

2894 REF 56 LAST 469 41,3732 0 4616 1 TC BANKCALL

2895 REF 1 41,3733 10620 1 CADR DSPMM

RECEIVEPLAY C(MCDEG)

L PINBALL GAME BUTTONS AND LIGHTS

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2896	PFF	4	LAST	454	41,3734	0 4204 0	TC	KILMCMCN	TURN ON KILL MONITOR BIT.
2897	PFF	5	LAST	455	41,3735	0 4433 1	TC	FLASHOFF	TURN OFF V/A FLASH.
2898	PFF	25	LAST	466	41,3736	0 4635 0	TC	PCSTJUMP	DCFS RELEASE AND GOES TO PINBRNCH IF
2899	PFF	1			41,3737	61534 1	CADR	TSTLTS4	ENDFILE IS AWAITING OPERATOR RESPONSE.
2901					41,3740	16001 1	12-11,1	OCT	16001
2902					41,3741	00330 1	PFILS2	OCT	330
2903					41,3742	55000 1	OCT55000	OCT	55000
2904					41,3743		ENDPINS2	EQUALS	

L PINGBALL GAME BUTTONS AND LIGHTS

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R2905 ERROR LIGHT RESET (PSET) TURNS OFF,
 R2906 UPLINK ACTIVITY, AUTO, HOLD, FREE, OPERATOR ERROR,
 R2907 PROG ALM, TRACKER FAIL.
 R2908 LEAVES GIMBAL LOCK AND NO ATT ALONE.
 R2909 IT ALSO ZEROS THE :TEST ALARM: OUT BIT, WHICH TURNS OFF STBY, RESTART.
 R2910 IT ALSO SETS :CAUTION RESET: TO 1.
 R2911 IT ALSO FORCES BIT 12 OF ALL DSPTAB ENTRIES TO 1.

2912	REF	2	LAST	460	40,3646		SETLCC DQPROC +2	
29125	REF	10	LAST	460	TO 462:	39 971*	COUNT# \$1/PIN	
2913	REF	3	LAST	452	40,3646	56 115 1	XC# 21/22PFG	RESTORE ORIGINAL C(DSPLOCK). THUS ERROR
2914	REF	11	LAST	467	40,3647	55 011 1	TS DSPLOCK	LIGHT RESET LEAVES DSPLOCK UNCHANGED.
2915					40,3650	0 0004 0	INHINT	
2916	REF	23	LAST	470	40,3651	3 4742 1	CAF BIT10	TURN ON :CAUTION RESET: OUTBIT
2917					40,3652	0 0006 1	EXTEND	
2918	REF	20	LAST	470	40,3653	05 011 1	WCR DSALMCUT	BIT10 CHAN 11
2919	REF	1			40,3654	3 3735 0	CAF GL+NDATT	LEAVE GIMBAL LOCK AND NO ATT INTACT,
2920	REF	25	LAST	470	40,3655	7 1035 1	MASK DSPTAB +110	TURNING OFF AUTO, HOLD, FREE,
2921	REF	28	LAST	470	40,3656	6 4735 1	AD BIT15	FREE ALARM, AND TRACKER.
2922	REF	36	LAST	472	40,3657	55 035 1	TS DSPTAB +110	
2923	REF	4	LAST	470	40,3660	4 5026 1	CS PRIC16	RESET FAIL BITS WHICH GENERATE PROG
2924	REF	23	LAST	470	40,3661	7 1300 1	MASK IMODES33	ALARM SO THAT IF THE FAILURE STILL
2925	REF	5	LAST	472	40,3662	6 5026 0	AD PRIC16	EXISTS, THE ALARM WILL COME BACK.
2926	REF	24	LAST	472	40,3662	55 000 1	TS IMODES33	
2927	REF	24	LAST	472	40,3664	4 4742 0	CS BIT10	
2928	REF	44	LAST	470	40,3665	7 1277 0	MASK IMODES30	
2929	REF	25	LAST	472	40,3666	6 4742 1	AD BIT10	
2930	REF	45	LAST	472	40,3667	55 0277 0	TS IMODES30	
2931	REF	1			40,3670	4 2734 0	CS RFAILS	
2932	REF	30	LAST	470	40,3671	7 0110 0	MASK RADMCDES	
2933	REF	4	LAST	470	40,3672	6 4745 0	AD RCEUFFIT	
2934	REF	21	LAST	472	40,3672	54 110 0	TS RADMCDES	
29341	REF	3	LAST	470	40,3674	7 6022 1	TC G13STALL	
2935	REF	26	LAST	472	40,3675	4 4742 0	CS BIT10	TURN OFF :TEST ALARM: OUTBIT.
2936					40,3676	0 0006 1	EXTEND	
2937	REF	7	LAST	470	40,3677	03 013 0	WAND CHAN12	
2938	REF	1			40,3700	4 3733 1	CS ERCCN	TURN OFF UPLINK ACTIVITY,
2939					40,3701	0 0006 1	EXTEND	OPERATOR ERROR.
2940	REF	21	LAST	472	40,3702	03 011 1	WAND DSALMCUT	
2941	REF	2	LAST	443	40,3703	2 4363 0	CAF BINCCN	(DEC 10)
2942	REF	4	LAST	460	40,3704	54 117 1	TS ERCNT	EPCNT = COUNT
2943					40,3705	0 0014 0	INHINT	
2944	REF	5	LAST	472	40,3706	50 117 0	INDEX ERCNT	
2945	REF	37	LAST	472	40,3707	11 022 1	CCS DSPTAB	
2946	REF	58	LAST	461	40,3710	6 4753 1	AD CNE	
2947	REF	1			40,3711	7 3716 1	TC ERPLLS	
2948	REF	56	LAST	472	40,3712	6 4753 1	AD CNE	
2949	REF	154	LAST	466	40,3713	4 0000 0	ERMINUS CS A	

L PINBALL GAME BUTTONS AND LIGHTS

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2950	RFF	1		40,3714	7 3736 1	MASK	NCTBIT12	
2951	RFF	1		40,3715	0 3721 0	TC	ERCCM	
2952	RFF	155	LAST 472	40,3716	4 0000 0	ERPLUS	CS	A
2953	RFF	2	LAST 473	40,3717	7 3736 1	MASK	NCTBIT12	
2954	RFF	156	LAST 473	40,3720	4 0000 0	CS	A	MIGHT WANT TO RESET CLPASS, DECERNCH,
2955	RFF	6	LAST 472	40,3721	50 117 0	ERCCM	INDEX	ERCNT
2956	RFF	39	LAST 472	40,3722	55 0022 1	TS	DSFTAB	ETC.
2957	RFF			40,3723	0 0003 1	PFLINT		
2958	RFF	7	LAST 473	40,3724	10 117 1	CCS	ERCNT	
2959	RFF	1		40,3725	0 3704 1	TC	TSTAB	+1
2960	RFF	105	LAST 467	40,3726	3 4755 1	CAF	ZERO	
2961	RFF	5	LAST 306	40,3727	54 375 1	TS	FAILREG	
29611	RFF	6	LAST 473	40,3730	54 376 1	TS	FAILREG	+1
2962	RFF	2	LAST 108	40,3731	55 357 0	TS	SPAIL	
2963	RFF	63	LAST 469	40,3732	0 5155 0	TC	ENDCFJCE	
2964				40,3733	00104 1	ERCON	CCT	104
A2965								
2966				40,3734	00330 1	RFALLS	CCT	330
29665				40,3735	00050 1	GL+NOATT	OCT	00050
2967				40,3736	73777 1	NCTBIT12	CCT	73777

CHAN 11 BITS 3,7.
 UPLINK ACTIVITY, AND OPERATOR ERROR.
 RADAR CCU AND DATA FAIL FLAGS.
 NO ATT AND GIMBAL LOCK LAMPS

2968 40,3737 ENDPINS1 EQUALS

2969 RFF 5 LAST 321 30,2000 SBANK= LCWSUPP

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R0100 MOD NO: C DATE: 1 MAY. 1968

R0101 MOD BY: DIGITAL DEVEL GROUP LOG SECTION R60,R62

R0102 FUNCTIONAL DESCRIPTION:

R0103 CALLED AS A GENERAL SUBROUTINE TO MANEUVER THE LM TO A SPECIFIED
R0104 ATTITUDE.R0105 1. IF THE 3-AXIS FLAG IS NOT SET THE FINAL CDL ANGLES ARE
R0106 CALCULATED (VFCPOINT).

R0107 2. THE FCAT ROLL ANGLES (MOUN 18) ARE CALCULATED (BALLANGS).

R0108 3. REQUEST FLASHING DISPLAY V56 N18 PLEASE PERFORM AUTO MANEUVER.

R0109 4. IF PRIORITY DISPLAY FLAG IS SET DO A PHASECHANGE. THEN AWAIT
R0110 ASTRONAUT RESPONSE.

R0111 5. DISPLAY RESPONSE RETURNS:

R0112 A. ENTER - RESET 3-AXIS FLAG AND RETURN TO CLIENT.

R0113 B. TERMINATE - IF IN P00 GO TO STEP 5A. OTHERWISE CHECK IF R61 IS
R0114 THE CALLING PROGRAM. IF IN R61 AN EXIT IS MADE TO G0TCV56. IF
R0115 NOT IN R61 AN EXIT IS DONE VIA G0TCPOOL.

R0116 C. PROCEED - CONTINUE WITH PROGRAM AT STEP 6.

R0117 6. IF THE 3-AXISFLAG IS NOT SET, THE FINAL CDL ANGLES ARE CALCULATED
R0118 (VFCPOINT).

R0119 7. THE FCAT ROLL ANGLES (MOUN 18) ARE CALCULATED (BALLANGS).

R0120 8. IF THE G+N SWITCH IS NOT SET GO BACK TO STEP 3.

R0121 9. IF THE AUTO SWITCH IS NOT SET GO BACK TO STEP 3.

R0122 10. NONFLASHING DISPLAY V56N18 (FCAT ANGLES).

R0123 11. DO A PHASECHANGE.

R0124 12. DO A MANEUVER CALCULATION AND TOOL DRIVE ROUTINE TO ACHIEVE FINAL
R0125 GIMBAL ANGLES (GCMANUR).

R0126 13. AT END OF MANEUVER GO TO STEP 3.

R0127 IF SATISFACTORY MANEUVER STEP 5A EXISTS R60.

R0128 FOR FURTHER ADJUSTMENT OF THE VEHICLE ATTITUDE ABOUT THE
R0129 DESIRED VECTOR, THE ROUTINE MAY BE PERFORMED AGAIN STARTING AT

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R0130 STEP 50.

R0131 CALLING SEQUENCE: TO BANKCALL
R0132 CADR R60LEMR0133 FRASABLE INITIALIZATION REQUIRED: SCAXIS, PCINTVSM (ECP VECPCINT)
R0134 3AXISFLG.R0135 SUBROUTINES CALLED: VECPCINT, BALLANGS, GCPPEF2R, LINUS, CDSPER,
R0136 GCMANLR, COWNFLAC, FRASCHNG, LFFLAGR0137 NORMAL EXIT MODES: CAF TEMPR60 (CALLER'S RETURN ADDRESS)
R0138 TO BANKJUMP

R0139 ALARMS: NONE

R0140 CLTFLG: NONE

R0141 CFPPI: CPHI, CTHTTA, CPSI, 3AXISFLG, TBASE2

0142				34,2000				BANK	34	
0143	REF	1		26,2110				SETLCC	MANUVER	
0144				26,2123				BANK		

0145	REF	1		1163				EBANK=	TEMPR60	
------	-----	---	--	------	--	--	--	--------	---------	--

0146	REF	1						CCUNT#	\$/R06	
0147	REF	2	LAST	271	26,2123	0 4645	1	R60LEM	TC	MAKECADR
0148	REF	2	LAST	475	26,2124	551163	0		TS	TEMPR60

01481	REF	14	LAST	290	26,2125	0 5504	0		TC	UFFLAG	INSURE THAT TOTAL ATTITUDE ERRORS ARE DISPLAYED ON FINAL ERROR NEEDLES.
01482	REF	3	LAST	266	26,2126	0 0013	0		ADRES	NEEDLFLG	
01483	REF	24	LAST	380	26,2127	0 5516	0		TC	COWNFLAC	
01484	REF	3	LAST	266	26,2128	00000	1		ADRES	NEED2FLG	

0149	REF	1			26,2131	3 4746	0	RECCMANA	CAF	3AXISPRIT	
0150	REF	13	LAST	291	26,2132	7 3101	0		MASK	FLAGWRD5	IS 3-AXIS FLAG SET

0151	REF	157	LAST	473	26,2133	10 000	0		CCS	A	
0152	REF	1			26,2134	1 2142	0		TCF	TCBALL	YES
0153	REF	27	LAST	385	26,2135	0 6042	1		TC	INTPRIT	

0154					26,2136	77624	1		CALL		
0155	REF	2	LAST	341	26,2137	56043	0			VECPCINT	TO COMPUTE FINAL ANGLES
0156	REF	5	LAST	370	26,2140	02322	1		STORE	CPHI	STORE FINAL ANGLES - CPHI, CTHTTA, CPSI
0157					26,2141	77776	1		EXIT		

0158	REF	57	LAST	470	26,2142	0 4616	1	TCBALL	TC	BANKCALL	
01585	REF	2	LAST	341	26,2143	54272	1		CADR	BALLANGS	TO CONVERT ANGLES TO FINAL
0159	REF	1			26,2144	3 2260	1	TCBALLA	CAF	VD6N1R	

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0160	REF	98	LAST	475	26,2145	0 4616 1	TC	BANKCALL	
0161	REF	1			26,2146	20711 1	CACR	GCPERF2R	DISPLAY PLEASE PERFORM AUTO MANEUVER
0162	REF	1			26,2147	0 2246 0	TC	R61TEST	
0163	REF	1			26,2150	0 2154 0	TC	REDOMANC	PROCEED
0164	REF	1			26,2151	0 2211 0	TC	ENDMANU1	ENTER I.E. FINISHED WITH R60
0165	REF	1			26,2152	0 2205 1	TC	CHKLINUS	TC CHECK FOR PRIORITY DISPLAYS
0166	REF	54	LAST	473	26,2153	0 5155 0	TC	ENDOFJOB	
0167	REF	2	LAST	475	26,2154	3 4746 0	REDOMANC	CAF	3AXISBIT
0168	REF	14	LAST	475	26,2155	7 0101 0	MASK	FLAGWRD5	IS 3-AXIS FLAG SET
0169	REF	158	LAST	475	26,2156	10 000 0	CCS	A	
0170	REF	1			26,2157	1 2165 0	TCF	TCBALLC	YES
0171	REF	28	LAST	475	26,2160	0 6042 1	TC	INTPRET	
0172					26,2161	77624 1	CALL		
0173	REF	3	LAST	475	26,2162	56040 0		VECPPOINT	TC COMPLETE FINAL ANGLES
0174	REF	6	LAST	475	26,2163	00322 1	STORE	CRHI	STORE ANGLES
0175					26,2164	77776 1	EXIT		
0176	REF	99	LAST	476	26,2165	0 4616 1	TOBALLC	TC	BANKCALL
01765	REF	3	LAST	475	26,2166	54272 1	CACR	BALLANGS	TO CONVERT ANGLES TO FCAI
0177	REF	1			26,2167	0 2261 0	TC	G+N,ALTC	CHECK AUTO MODE
0178	REF	159	LAST	476	26,2170	10 000 0	CCS	A	
0179	REF	1			26,2171	1 2144 0	TCF	TCBALLA	NCT AUTO, GC REREQUEST AUTO MANEUVER.
0180	REF	2	LAST	475	26,2172	3 2260 1	AUTOMANV	CAF	VC6N18
0181	REF	150	LAST	476	26,2173	0 4616 1	TC	BANKCALL	STATIC DISPLAY DURING AUTO MANEUVER
0182	REF	1			26,2174	20452 0	CACR	GCDSPF	-
0183	REF	2	LAST	476	26,2175	0 2205 1	TC	CHKLINUS	TO CHECK FOR PRIORITY DISPLAYS
0184	REF	101	LAST	476	26,2176	0 4616 1	STARTMANV	TC	BANKCALL
0185	REF	1			26,2177	17742 0	CACR	GMANVR	PERFORM MANEUVER VIA KALCMANU
0186	REF	2	LAST	476	26,2200	1 2144 0	ENDMANUV	TCF	TCBALLA
0187	REF	35	LAST	475	26,2201	0 5516 0	ENDMANU1	TC	DOWNFLAG
0188	REF	3	LAST	341	26,2202	00124 0	ADRES	3AXISFLG	RESET 3-AXIS FLAG
0189	REF	3	LAST	475	26,2203	31 1163 1	CAF	TENPR60	-
0190	REF	6	LAST	447	26,2204	0 4640 1	TC	BANKJUMP	-
0191	REF	3	LAST	263	26,2205	4 0100 1	CHKLINUS	CS	FLAGWRD4
0192	REF	1			26,2206	7 4740 1	MASK	PESPFRIT	IS PRIORITY DISPLAY FLAG SET?
0193	REF	160	LAST	476	26,2207	10 000 0	CCS	A	-
0194	REF	146	LAST	467	26,2210	0 0002 0	TC	0	NC - EXIT
0195	REF	147	LAST	476	26,2211	3 0002 0	CA	0	
0196	REF	234	LAST	464	26,2212	54 156 1	TS	MFAC +2	SAVE RETURN
0197	REF	16	LAST	444	26,2213	4 6250 1	CS	TRPFE	OBTAIN LOCATION FOR RESTART
0198	REF	4	LAST	371	26,2214	6 0123 0	AD	BUF2	FIELDS G OF LAST DISPLAY
0199	REF	1			26,2215	55 0054 0	TS	TBASE2	
0200	REF	2	LAST	289	26,2216	0 5353 1	TC	PFASCFNG	
0201					26,2217	00132 1	OCT	IC132	

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0202	REF	21	LAST	463	26,2220	3 4745 0	CAF	BIT7		
0203	REF	1			26,2221	0 5464 1	TC	LINUS	GC SET BITS FOR PRIORITY DISPLAY	-
0204	REF	235	LAST	476	26,2222	0 0156 0	TC	MPAC +2		
0205	REF	2	LAST	369	26,2223	3 7717 1	REFLINS	CAF	PRIC26	RESTORE ORIGINAL PRIORITY
0206	REF	6	LAST	300	26,2224	0 5146 1	TC	PRIOCHNG		
0207	REF	3	LAST	298	26,2225	3 4747 1	CAF	TRACKBIT	DON'T CONTINUE R60 UNLESS TRACKFLAG ON.	
0208	REF	15	LAST	295	26,2226	7 0075 1	MASK	FLAGWRD1		
0209	REF	161	LAST	476	26,2227	10 000 0	CCS	A		
0210	REF	1			26,2230	1 2242 1	TCF	RER60		
0211	REF	3	LAST	229	26,2231	3 4745 0	CAF	RNDVZBIT	IS IT P20?	
0212	REF	19	LAST	288	26,2232	7 0074 0	MASK	FLAGWRD0		
0213	REF	162	LAST	477	26,2233	10 000 0	CCS	A		
0214					26,2234	0 2240 0	TC	+4	YES	
0215	REF	4	LAST	476	26,2235	0 5353 1	TC	PHASCHNG	NO, MUST BE P25, SET 2.11 SPCT	
0216					26,2236	4 0112 1	CCT	40112		
0217	REF	65	LAST	476	26,2237	0 5155 0	TC	ENDOFJCB		
0218	REF	5	LAST	477	26,2240	0 5353 1	TC	PHASCHNG	SET 2.7 SPCT FOR P20	
0219					26,2241	4 0072 0	OCT	40072		
0220	REF	66	LAST	477	26,2242	0 5155 0	TC	ENDOFJCB		
0221	REF	15	LAST	475	26,2243	0 5514 0	REFR60	TC	UPFLAG	SET PRIC DISPLAY FLAG AFTER RESTART
0222	REF	1			26,2244	0 0077 1	ACRFS	PDSPFLAG		
0223	REF	2	LAST	476	26,2245	0 1054 1	TC	TBASE2		
0224	REF	8	LAST	460	26,2246	3 1010 1	R61TEST	CA	MCDPRG	IF WE ARE IN R60 IT MUST BE V49 OR V89
0225					26,2247	0 0006 1	EXTEND			
0226	REF	2	LAST	476	26,2250	1 2201 1	BZF	ENDMANUI	THUS WE GO TO ENDEXT VIA USER	
0227	REF	4	LAST	476	26,2251	3 0100 0	CA	FLAGWRD4	ARE WE IN R61 (P20 OR P25)	
0228	REF	2	LAST	476	26,2252	7 4740 1	MASK	PCSPFBIT		
0229					26,2253	0 0006 1	EXTEND			
0230	REF	3	LAST	246	26,2254	1 6071 1	BZF	GOTOPDOH	NO	
0231	REF	1			26,2255	0 6025 0	TC	GCTCV56	YES	
0232					26,2256	2 0100 1	BIT14+7	CCT	20100	-
0233					26,2257	0 0203 0	OCT203	OCT	203	
0234					26,2260	0 1422 1	VC6N18	VN	0618	
R0236					SUBROUTINE TC CHECK FOR G+N CONTROL, AUTO STABILIZATION					
R0237					RETURNS WITH C(A) = + IF NOT SET FOR G+N, AUTO					
R0238					RETURNS WITH C(A) = +1 IF SWITCHES ARE SET					
0239					26,2261	0 0006 1	G+N, AUTO	EXTEND		

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0240	REF	3	LAST	185	26,2262	00 030 1
0241	REF	27	LAST	472	26,2263	7 4742 0
0242	REF	163	LAST	477	26,2264	10 090 0
0243	REF	148	LAST	476	26,2265	0 0002 0
0244					26,2266	0 0006 1
0245	REF	2	LAST	282	26,2267	00 131 0
0246	REF	46	LAST	466	26,2271	7 4736 0
0247	REF	149	LAST	476	26,2271	0 0002 0

READ	CHAN30
MASK	BIT10
CCS	A
TC	Q
EXTEND	
READ	CHAN31
MASK	BIT14
TC	G

ISITAUTC

NOT IN G+A C(A) = +
CHECK FOR AUTO MODE

(+) = NOT IN AUTO, (+C) = AOK

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R0248 PROGRAM DESCRIPTION BALLANGS
R0249 MOD NO. LCC SECTION R60,R62

R0250 WRITTEN BY RAMA M. AIYAWAF
R0251 FUNCTIONAL DESCRIPTION

R0252 COMPLETES LM FDATA BALL DISPLAY ANGLES
R0253 CALLING SEQUENCE

R0254 TC BALLANGS
R0255 NORMAL EXIT MODE

R0256 TC BALLEXIT (SAVED Q)

R0257 ALARM OR EXIT MODE NIL

R0258 SUBROUTINES CALLED
R0259 CP*TF*G
R0260 ARCTAN

R0261 INPUT

R0262 CPFI,CTHETA,CPSI ARE THE ANGLES CORRESPONDING TO AOC,AIC,AMC. THEY ARE
R0263 SP,2S COMPLIMENT SCALED TO HALF REVOLUTION.
R0264 OUTPUT

R0265 FDATAI,FDATAIY,FDATAIZ ARE THE REQUIRED BALL ANGLES SCALED TO HALF REVOLUTION
R0266 SP,2S COMPLIMENT.

R0267 THESE ANGLES WILL BE DISPLAYED AS DEGREES AND HUNDREDTHS, IN THE ORDER ROLL, PITCH, YAW, USING NCUNS 18 & 19.

R0268 FRASABLE INITIALIZATION REQUIRED

R0270 CPFI,CTHETA,CPSI EACH A SP REGISTER
R0271 DEFBIS

R0272 A,L,C,MPAC,SINCL,COSCL,PUSHLIST,BALLEXIT

R0273 NOMENCLATURE: CPFI, CTHETA, & CPSI REPRESENT THE OUTER, INNER, & MIDDLE GIMBAL ANGLES, RESPECTIVELY; OR
R0274 EQUIVALENTLY, CDUX, CDUY, & CDJZ.

R0276 NOTE: ARCTAN CHECKS FOR OVERFLOW AND SHOULD BE ABLE TO HANDLE ANY SINGULARITIES.

0278 REF 2 LAST 346 26,2270 SFTLCC BAWLANGS
0279 26,2272 BANK

0280 REF 1 COUNT# \$\$/BALL
0281 REF 3 LAST 475 26,2272 1 4645 1 BALLANGS TC MAKECADR
0282 REF 1 26,2272 55 337 0 TS PALLEXIT
0283 REF 7 LAST 476 26,2274 3 3321 1 CA CPFI

L R6L,PA2

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0284	RFF	7	LAST	253	26,2275	54 771 1	TS	CDUSPCT +4	
0285	RFF	2	LAST	370	26,2276	3 0222 1	CA	CTHETA	
0286	RFF	8	LAST	480	26,2277	54 765 1	TS	CDUSPCT	
0287	RFF	3	LAST	370	26,2300	3 0323 0	CA	CFSI	
0288	RFF	9	LAST	480	26,2301	54 767 0	TS	CDUSPCT +2	
0289	RFF	29	LAST	476	26,2302	0 6042 1	TC	INTPRFT	
0290					26,2303	4500 1	SETPD	CALL	
0291					26,2304	0000 1 0		OD	
0292	RFF	1			26,2305	47545 0		CC*TR*G	
0293					26,2306	41345 0	DLCAD	DMP	
0294	RFF	1			26,2307	00742 0		SINCDUX	SIN (CGA)
0295	RFF	1			26,231	00746 1		CCSCDUZ	CCS (MGA)
0296					26,2311	57552 1	SLI	DCOMP	SCALE
0297					26,2312	65336 1	ARCSIN	PECL	YAW = ARCSIN(-SXCZ) INTO 0 PD
0298	RFF	1			26,2313	00747 1		SINCDUZ	
0299	RFF	4	LAST	323	26,2314	14723 0	STOCL	SINTH	(SINTH = 160 IN PD)
0300	RFF	2	LAST	480	26,2315	00746 1		CCSCDUZ	
0301					26,2316	72405 0	DMP	SLI	RESCALE
0302	RFF	1			26,2317	00750 0		CCSCDUZ	
0303	RFF	4	LAST	323	26,2320	34021 0	STCALL	CCSTH	(CCSTH = 160 IN PD)
0304	RFF	1			26,2321	26510 1		ARCTAN	
0305					26,2322	41325 0	PECL	DMP	ROLL = ARCTAN(SZ/CZCX) INTO 2 PD
0306	RFF	2	LAST	480	26,2323	00740 1		SINCDLZ	
0307	RFF	2	LAST	480	26,2324	00742 0		SINCDLX	
0308					26,2325	41512 1	SL2	PUSH	SXSZ INTO 4 PD
0309					26,2326	65205 0	DMP	PDOL	SXSZCY INTO 4 PD
0310	RFF	1			26,2327	00744 1		CCSCDUY	
0311					26,2330	65205 0	DMP	PECL	SXSZSY INTO 6 PD
0312	RFF	1			26,2331	00736 0		SINCDLY	
0313	RFF	2	LAST	480	26,2332	00750 0		CCSCDUX	
0314					26,2333	72405 0	DMP	SLI	CXCY
0315	RFF	2	LAST	480	26,2334	00744 0		CCSCDLY	
0316					26,2335	45425 0	DSL	STADR	FULL UP FROM 6 PD
0317	RFF	5	LAST	480	26,2336	63756 0	STOCL	CCSTH	CCSTH = CXCY - SXSZSY
0318	RFF	2	LAST	480	26,2337	00736 0		SINCDLY	
0319					26,2340	72405 0	DMP	SLI	
0320	RFF	2	LAST	480	26,2341	00750 0		CCSCDLX	CXSY
0321					26,2342	45415 0	DAC	STADR	PULL UP FROM 4 PD
0322	RFF	5	LAST	480	26,2343	43754 0	STCALL	SINTH	SINTH = CXSY + SXSZCY
0323	RFF	2	LAST	480	26,2344	26510 1		ARCTAN	RETURNS WITH C(MPAC) = FITCH
0324					26,2345	55525 0	PECL	VDEF	FITCH INTO 2 PD, ROLL INTO MPAC FROM 2PD
0325					26,2346	77624 0	RTB		VDEF MAKES V(MPAC) = ROLL, FITCH, YAW
0326	RFF	2	LAST	366	26,2347	21621 1		VISTC2S	
0327	RFF	2	LAST	306	26,2350	02345 1	STCR	FDAIX	MODE IS TP
0328					26,2351	77776 1	EXIT		
0329	RFF	2	LAST	479	26,2352	3 1337 1	ENCBALL	CA	BALLFXIT

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03295 RFF 7 LAST 476 26,2353 0 4640 1

TC BANKJUMP

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P0330 PROGRAM DESCRIPTION - VECPOINT

P0331 THIS INTERPRETIVE SUBROUTINE MAY BE USED TO POINT A SPACECRAFT AXIS IN A DESIRED DIRECTION. THE AXIS
 R0333 TO BE POINTED MUST APPEAR AS A HALF UNIT DOUBLE PRECISION VECTOR IN SUCCESSIVE LOCATIONS OF EPASAELE MEMORY
 R0335 BEGINNING WITH THE LOCATION CALLED SCAXIS. THE COMPONENTS OF THIS VECTOR ARE GIVEN IN SPACECRAFT COORDINATES.
 R0337 THE DIRECTION IN WHICH THIS AXIS IS TO BE POINTED MUST APPEAR AS A HALF UNIT DOUBLE PRECISION VECTOR IN
 R0339 SUCCESSIVE LOCATIONS OF EPASAELE MEMORY BEGINNING WITH THE ADDRESS CALLED POINTVSM. THE COMPONENTS OF THIS
 R0341 VECTOR ARE GIVEN IN STABLE MEMBER COORDINATES. WITH THIS INFORMATION VECPOINT COMPLETES A SET OF THREE GIMBAL
 R0343 ANGLES (2S COMPLEMENT) CORRESPONDING TO THE CROSS-PRODUCT ROTATION BETWEEN SCAXIS AND POINTVSM AND STORES THEM
 R0345 IN T(PAC) BEFORE RETURNING TO THE CALLER.
 R0346 THIS ROTATION, HOWEVER, MAY BRING THE S/C INTO GIMBAL LOCK. WHEN POINTING A VECTOR IN THE Y-Z PLANE,
 R0348 THE TRANSPONDER AXIS, OR THE ACT FOR THE LEM, THE PROGRAM WILL CORRECT THIS PROBLEM BY ROTATING THE CROSS-
 R0350 PRODUCT ATTITUDE ABOUT POINTVSM BY A FIXED AMOUNT SUFFICIENT TO ROTATE THE DESIRED S/C ATTITUDE OUT OF GIMBAL
 R0352 LOCK. IF THE AXIS TO BE POINTED IS MORE THAN 40.6 DEGREES BUT LESS THAN 60.5 DEG FROM THE +X (OR -X) AXIS,
 R0354 THE ADDITIONAL ROTATION TO AVOID GIMBAL LOCK IS 35 DEGREES. IF THE AXIS IS MORE THAN 60.5 DEGREES FROM +X (OR -X)
 R0356 THE ADDITIONAL ROTATION IS 25 DEGREES. THE GIMBAL ANGLES CORRESPONDING TO THIS ATTITUDE ARE THEN COMPLETED AND
 R0358 STORED AS 2S COMPLEMENT ANGLES IN T(PAC) BEFORE RETURNING TO THE CALLER.
 R0360 WHEN POINTING THE X-AXIS, OR THE THRUST VECTOR, OR ANY VECTOR WITHIN 40.6 DEG OF THE X-AXIS, VECPOINT
 R0362 CANNOT CORRECT FOR A CROSS-PRODUCT ROTATION INTO GIMBAL LOCK. IN THIS CASE A PLATFORM REALIGNMENT WOULD BE
 R0364 REQUIRED TO POINT THE VECTOR IN THE DESIRED DIRECTION. AT PRESENT NO INDICATION IS GIVEN FOR THIS SITUATION
 R0366 EXCEPT THAT THE FINAL MIDDLE GIMBAL ANGLE IN MPAC +2 IS GREATER THAN 59 DEGREES.

P0368 CALLING SEQUENCE -

R0369 1) LOAD SCAXIS, POINTVSM
 P0371 2) CALL
 R0371 VECPOINT

R0372 RETURNS WITH

R0373 1) DESIRED OUTER GIMBAL ANGLE IN MPAC
 R0374 2) DESIRED INNER GIMBAL ANGLE IN MPAC +1
 R0375 3) DESIRED MIDDLE GIMBAL ANGLE IN MPAC +2

P0376 FRASABLES USED -

R0377 1) SCAXIS 6
 R0378 2) POINTVSM 6
 R0379 3) MIS 18
 R0380 4) DEL 18
 R0381 5) CCE 6
 R0382 6) VECQTEMP 1
 R0383 7) ALL OF VAC AREA 43

R0384 TOTAL 99

0385 PFF 1 27,201 SETLCC VECPT
 0386 27,2032 BANK

L R60,R62

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CCOUNT#	##/VECPPT
0387	REF 1
0388	REF 11 LAST 367 F6,1676
038805	27,2132 42020 1 VFCPNT1 STQ BOV
03881	REF 1 27,2133 03325 0 VECQTEMP
038815	REF 1 27,2134 56035 1 VECPT2
03882	27,2135 52164 0 VECPT2 AXC,2 ECTC
038825	REF 11 LAST 366 27,2136 03246 1 MIS
038865	REF 1 27,2137 56146 0 STORANG
0389	27,2140 49020 1 VECPCINT STQ BCV
0390	REF 2 LAST 483 27,2141 03325 0 VECQTEMP
0391	REF 1 27,2142 56043 0 VECLEAR
0392	27,2143 47164 1 VECLEAR AXC,2 RTP
0393	REF 12 LAST 483 27,2144 03246 1 MIS
0394	REF 2 LAST 352 27,2145 44403 0 READCDUK
0395	27,2146 34032 1 STORANG STCALL 25D
0396	REF 3 LAST 352 27,2147 44410 1 CDUTODCM
0397	27,2150 61375 1 VLCAE
0398	REF 2 LAST 340 27,2151 03773 1 PCINTVSM
0399	REF 13 LAST 483 27,2152 03247 1 MIS
0400	27,2153 77656 1 UNIT
0401	27,2154 03035 1 STORE 28D
A0402	
0403	27,2155 53435 0 VXV
0404	REF 12 LAST 341 27,2156 03765 0 SCAXIS
0405	27,2157 57410 1 BCV
0406	REF 1 27,2160 56170 1 PICKAXIS
0407	REF 40 LAST 365 27,2161 17271 0 STCDL
0408	27,2162 01045 0 CCF
0409	27,2163 50725 0 DSL
0410	REF 1 27,2164 14415 1 BMN
0411	REF 2 LAST 483 27,2165 56170 1 DPP-14
0412	27,2166 50375 0 PICKAXIS
0413	REF 13 LAST 483 27,2167 03765 0 DCT
0414	27,2170 00035 1 SCAXIS
0415	27,2171 65552 0 28D
0416	27,2172 77624 1 SLI
0417	REF 2 LAST 365 27,2173 44527 1 ARCCOS
0418	27,2174 75160 1 CCMPMATX CALL
0419	REF 14 LAST 483 27,2175 03246 1 DELCCMP
0420	REF 11 LAST 366 27,2176 02230 1 AXC,1
0421	27,2177 77624 1 AXC,2
0422	REF 3 LAST 366 27,2180 44312 1 MIS
0423	27,2181 51545 1 KEL
0424	27,2182 01007 0 CALL
0425	27,2183 50025 0 MXXB3
0426	REF 1 27,2184 14472 1 ABS
0427	REF 1 27,2185 56160 0 6

THIS ENTRY USES DESIRED CCDS
NOT PRESENT-ENTER WITH CCDS'S IN MPAC

SAVE RETURN ADDRESS

AND CLEAR CVFIND

READ THE PRESENT CDU ANGLES AND
STORE THEM IN PD25, 26, 27

S/C AXES TO STABLE MEMBER AXES (MIS)

RESOLVE THE POINTING DIRECTION VF INTO
INITIAL S/C AXES (VF = PCINTVSM)

PD 28 29 30 31 32 33

TAKE THE CROSS PRODUCT VF X VI
WHERE VI = SCAXIS

CHECK MAGNITUDE
OF CROSS PRODUCT
VFCTC, IF LESS
THAN R-14 ASSUME
UNIT OPERATION
INVALID.

NOW COMPUTE THE TRANSFORMATION FROM
FINAL S/C AXES TO INITIAL S/C AXES MFI

COMPUTE THE TRANSFORMATION FROM FINAL
S/C AXES TO STABLE MEMBER AXES
MFS = MIS MFI
(IN PD LIST)

MFS6 = SIN(CPSI) \$2

= SIN(59 DEGS) \$2
/CPSI/ LESS THAN 59 DEGS

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A0428 I.E. DESIRED ATTITUDE ACT IN GIMBAL LOCK

0429				27,2104	51545 1	CLCAC	ABS	CHECK TO SEE IF WE ARE POINTING
0430	REF	14	LAST	483	27,2107		SCAXIS	THE THRUST AXIS
0431				27,2110	51025 1	DSU	REF	
0432	REF	1			27,2111		SINVEC1	SIN 49.4 DEGS 42
0433	REF	2	LAST	483	27,2112		FINDGIMB	IF SO, WE ARE TRYING TO POINT IT INTO
0434				27,2113	77775 1			GIMBAL LOCK, ABORT COULD GO HERE
0435				27,2114	77626 0	VLCD		
0436	REF	15	LAST	483	27,2115		STADR	
0437				27,2116	77626 0	STCVL	MIS +12C	
0438	REF	16	LAST	484	27,2117		STADR	STORE MFS (IN PC LIST) IN MIS
0439				27,2120	77625 0	STCVL	MIS +6	
0440	REF	17	LAST	484	27,2121		STADR	
0441	REF	18	LAST	484	27,2122		STCVL	MIS
0442				27,2123	57444 1		MIS +6	INNER GIMBAL AXIS IN FINAL S/C AXES
0443	REF	1			27,2124	BPL	VCOMP	LOCATE THE IG AXIS DIRECTION CLOSEST TO
							IGSAMX	FINAL X S/C AXIS
0444				27,2125	50035 1	IGSAMX	VXV	FIND THE SHORTEST WAY OF ROTATING THE
0445	REF	15	LAST	484	27,2126		SCAXIS	S/C OUT OF GIMBAL LOCK BY A ROTATION
0446	REF	1			27,2127		U=SCAXIS	ABOUT +/- SCAXIS, I.E. IF (IG (SGN MFS3)
A0447								X SCAXIS . XFI LESS THAN 0, U = SCAXIS
A0448								OTHERWISE U = -SCAXIS

0449				27,2130	57575 1	VLOAD	VCOMP	
0450	REF	16	LAST	484	27,2131		SCAXIS	
0451	REF	41	LAST	483	27,2132	STGALL	CCF	ROTATE ABOUT -SCAXIS
0452	REF	1			27,2133		CHEKAXIS	
0453				27,2134	77775 1	L=SCAXIS	VLCD	
0454	REF	17	LAST	484	27,2135		SCAXIS	
0455	REF	42	LAST	484	27,2136		STCPE	ROTATE ABOUT + SCAXIS
0456				27,2137	51545 1	CHEKAXIS	DLCAD	
0457	REF	18	LAST	484	27,2140		SCAXIS	SEE IF WE ARE POINTING THE ACT
0458				27,2141	51125 1	DSL	BFL	
0459	REF	1			27,2142		SINVEC2	SIN 29.5 DEGS 42
0460	REF	1			27,2143		PICKANG1	IF SO, ROTATE 50 DEGS ABOUT +/- SCAXIS
0461				27,2144	52145 0	CLCAC	GETD	IF NOT, MUST BE POINTING THE TRANSPONDER
0462	REF	1			27,2145		VECANG2	OR SOME VECTOR IN THE Y, OF 2 PLANE
0463	REF	1			27,2146		COMPMSN	IN THIS CASE ROTATE 35 DEGS TO GET CLT
A0464								OF GIMBAL LOCK (VECANG2 4360)
0465				27,2147	77745 1	PICKANG1	CLOAD	
0466	REF	1			27,2150		VECANG1	= 50 DEGS 4360
0467				27,2151	77624 1	COMPMSN	CALL	
0468	REF	3	LAST	483	27,2152		DELCOMP	COMPUTE THE ROTATION ABOUT SCAXIS TO
0469				27,2153	75160 1	AXC,1	AXC,2	BRING MFS OUT OF GIMBAL LOCK
0470	REF	19	LAST	484	27,2154		MIS	
0471	REF	12	LAST	483	27,2155		KEL	
0472				27,2156	77624 1	CALL		COMPUTE THE NEW TRANSFORMATION FROM
0473	REF	4	LAST	483	27,2157		MXM3	DESIRED S/C AXES TO STABLE MEMBER AXES
A0474								WHICH WILL ALIGN VI WITH VE AND VCIC

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A0475																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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0520	26,2411	03070	VEGANG2	2DEC	.0972222222	= 35 DEGRFFS	1260
0520	26,2412	34344	0				
0521	26,2413	00000	1	IBITCF	CCT	0	KEEP THIS BEFORE DPB(-14) *****
0522	26,2414	00000	0	DPB-14	CCT	00001	
0523	26,2415	00000	1	CCT	00000		

L R61, R62

LSER'S PAGE NO. 14 E6 S3

P0524 ROUTINE FOR INITIATING AUTOMATIC MANEUVER VIA KEYBOARD (V49)

0525					34,2000		BANK	34
0526	REF	1			23,2000		SETLCC	R62
0527					23,2103		BANK	
0528	REF	12	LAST	493	56,1676		EBANK=	BCDU
0529	REF	1					CCOUNT#	\$/P62

0530	REF	1			23,2103		R62DISP	EQUALS	R62FLASH
------	-----	---	--	--	---------	--	---------	--------	----------

0531	REF	1			23,2103	3 5010 0	P62FLASH	CAF	V06N22	FLASH V06N22 AND
0532	REF	102	LAST	476	23,2104	0 4616 1		TC	BANKCALL	ICCU ANGLES
0533	REF	6	LAST	382	23,2105	20477 1		CADR	GCFLASH	
0534	REF	20	LAST	378	23,2106	1 5472 1		TCF	ENDEXT	TERMINATE
0535	REF	1			23,2107	1 2111 0		TCF	GCMOVE	PROCFED
0536	REF	2	LAST	487	23,2110	1 2103 0		TCF	R62FLASH	ENTER

A0537
A0538ASTRONAUT MAY LOAD NEW ICCLs AT THIS
PCINT

0539	REF	16	LAST	477	23,2111	0 5504 0	GCMOVE	TC	UPFLAG	SET FOR 3-AXIS MANEUVER
0540	REF	4	LAST	476	23,2112	00124 0		ADRES	3AXISFLG	

0541	REF	102	LAST	497	23,2113	0 4616 1		TC	BANKCALL	
0542	REF	2	LAST	341	23,2114	54123 0		CADR	R60LEM	
0543	REF	31	LAST	487	23,2115	1 5472 1		TCF	ENDEXT	END R62

L S-BAND ANTENNA FOR LM

USER'S PAGE NO. 1 EC S3

R2000 SUBROUTINE NAME: RCS - S-BAND ANTENNA FOR LM

R2001 MODD BY T. JAMES

R2002 MODD BY P. SHAKIP

R2003 FUNCTIONAL DESCRIPTION

R2004 THE S-BAND ANTENNA ROUTINE, RCS, COMPUTES AND DISPLAYS THE PITCH AND
 R2005 YAW ANTENNA GIMBAL ANGLES REQUIRED TO POINT THE LM STEERABLE ANTENNA
 R2006 TOWARD THE CENTER OF THE EARTH. THIS ROUTINE IS SELECTED BY THE ASTRO-
 R2007 NALT VIA DSKY ENTRY DURING COASTING FLIGHT OR WHEN THE LM IS ON THE MOON
 R2008 SURFACE. THE EARTH OR MOON REFERENCE COORDINATE SYSTEM IS USED DEPENDING
 R2009 ON WHETHER THE LM IS ABOUT TO ENTER OR HAS ALREADY ENTERED THE MOON
 R2010 SPHERE OF INFLUENCE, RESPECTIVELY. CAN BE CALLED ANY TIME EXCEPT WHEN
 R2011 ANOTHER EXTENDED VERB IS IN USE. DISPLAY IS MEANINGLESS WITH IML OFF.

R2011 TO CALL SUBROUTINE, ASTRONALT KEYS IN V 64 E

R2012 SUBROUTINES CALLED-

R2014 INTERPT

R2015 LOADTIME

R2016 LEMCONIC

R2017 LUNPES

R2018 CULTRIG

R2019 *SMAR*

R2020 BANKCALL

R2021 B5OFF

R2022 FANCFJCE

R2023 BLANKET

R2024 RETURNS WITH

R2025 PITCH ANGLE IN PITCHANG REV. B)

R2026 YAW ANGLE IN YAWANG REV. B)

R2027 FRASAELES USED

R2028 PITCHANG

R2029 YAWANG

R2030 PIN

R2031 VAC AREA

2032 41,2742

2033 REF 4 LAST 288 42,2000

2034 42,3606

BANK 41

SETLOC SBAND

BANK

2035 REF 1 F7,1471

2036 REF 2 LAST 46 TC 47: 2 2*

2039 REF 30 LAST 480 42,3606 C 6042 1 SPANCANT TC

EBANK= WHCCAPES

COUNT# 14/RCS

INTERPT

L S-EAR ANTENNA FOR LM

LSER'S PAGE NO. 2 E7 S4

2040					42,3617	47701 0	SETPC	RTP	
2041					42,3618	00001 0		OE	
2042	REF	5	LAST	381	42,3611	21574 1		LCADTIME	PICK UP CURRENT TIME
2043	REF	6	LAST	340	42,3612	34141 0	STCALL	TDEC1	ADVANCE INTEGRATION TO TIME IN TDEC1
2044	REF	2	LAST	340	42,3613	27101 1		LEMCCNIC	USING CCNIC INTEGRATION
2045					42,3614	46135 1	SLCAC	BH1Z	
2046	REF	1			42,3615	00050 1		X2	X2 =0 EARTH SPHERE, X2 =2 MCCN SPHERE
2047	REF	1			42,3616	65634 0		CCNV4	
2048					42,3617	77775 1	VLCAC		
2049	REF	3	LAST	340	42,3620	00001 0		RATT	
2050	REF	1			42,3621	16205 1	STODL	RLM	
2051	REF	3	LAST	209	42,3622	00015 0		TAT	
2052					42,3623	77624 1	CCNV3	CALL	
2053	REF	1			42,3624	33647 1		LUNPES	UNIT POSITION VECTOR FROM EARTH TO MCCN
2054					42,3625	74375 0	VLCAC	VXSC	
2055	REF	2	LAST	125	42,3626	02723 0		VMCCN	
2056	REF	1			42,3627	24001 0		REMDIST	MEAN DISTANCE FROM EARTH TO MCCN
2057					42,3630	53372 1	VSL1	VAC	
2058	REF	2	LAST	489	42,3631	32205 1		RLM	
2059					42,3632	77650 1	EOTO		
2060	REF	1			42,3633	65636 1		CCNV5	
2061					42,3634	77775 1	CONV4	VLCAD	
2062	REF	4	LAST	489	42,3635	00001 0		RATT	LE = -UNIT(RATT) EARTH SPHERE
2063					42,3636	53401 1	CCNV5	SETPC	UE = -UNIT((REM)(UEM) + RL) MCCN SPHERE
2064					42,3637	00001 0		OD	SET PL PCINTER TO 0
2065					42,3640	45176 1	VCCMF	CALL	
2066	REF	1			42,3641	47541 1		CDLTRIG	COMPUTE SINES AND COSINES OF CDU ANGLES
2067					42,3642	76521 0	MXV	VSL1	TRANSFORM REF. COORDINATE SYSTEM TO
2068	REF	7	LAST	240	42,3642	01734 0		REFSMAT	STABLE MEMBER R-1 X B-1 X B+1 = B-1
2069					42,3644	71206 0	PUSH	DLCAD	EC
2070	REF	2	LAST	300	42,3645	66524 1		H16ZEROS	
2071	REF	2	LAST	119	42,3646	02201 0	STCRF	PITCHING	
2072	REF	1			42,3647	26203 1	STOVL	YAWANG	ZERO CLT ANGLES
2073					42,3650	77624 1	CALL		
2074	REF	1			42,3651	47673 0		*SMNB*	
2075	REF	3	LAST	489	42,3652	16205 1	STOCL	RLM	PRE-MULTIPLY RLM BY (NBSA) MATRIX(BQ)
2076	REF	4	LAST	489	42,3653	02207 0		RLM +2	
2077					42,3654	45206 1	PLSH	DSL	
2078	REF	5	LAST	489	42,3655	02205 1		RLM	
2079					42,3656	77605 1	DMP		
2080	REF	1			42,3657	25767 0		1CVSGRT2	
2081	REF	6	LAST	489	42,3660	16207 0	STOCL	RLM +2	
2082					42,3661	41215 1	DAD	DMP	
2083	REF	7	LAST	489	42,3662	02215 1		RLM	
2084	REF	2	LAST	489	42,3663	25767 0		1CVSGRT2	
2085	REF	8	LAST	489	42,3664	26205 1	STOVL	RLM	R B-1
2086	REF	9	LAST	489	42,3665	02205 1		RLM	
2087					42,3666	62256 0	UNIT	PCVL	
2088	REF	10	LAST	489	42,3667	02205 1		PLM	
2089					42,3670	72431 1	VPRCJ	VSL2	PROJECTION OF R ONTO LM XZ PLANE

L S-BAND ANTENNA FOP LM

LSEFF'S PAGE NO. 3

E7 S4

2000	REF	1			42,3671	06522 0		HILNITY	
2001					42,3672	40145 1	BVSL	RCV	
2002	REF	11	LAST	485	42,3673	722 5 1		RLM	CLEAR OVERFLOW INDICATOR IF ON
2003	REF	1			42,3674	65675 0		CCVCNV	
2004					42,3675	40056 0	CCVCNV	RCV	EXIT ON OVERFLOW
2005	REF	1			42,3676	65743 1		SBANDEX	
2006					42,3677	47206 0	PLSF	VXV	LRP VECTOR R-1
2007	REF	1			42,3700	06516 0		HILNITZ	
2008					42,3701	57572 0	VSL1	VCOMP	$UZ \times LRP = -(LRP \times UZ)$
2009	REF	12	LAST	490	42,3702	02205 1	STCRE	RLM	X VEC E-1
2100					42,3703	63241 0	DOT	PDVL	SGN(X,UY) UNSCALED
2101	REF	2	LAST	490	42,3704	06520 0		HILNITY	
2102	REF	13	LAST	490	42,3705	02205 1		RLM	
2103					42,3706	75246 0	ARVAL	SIGN	
2104					42,3707	77736 0	ASIN		$ASIN((SGN(X,UY))ABV(X))$ REV PD
2105	REF	3	LAST	485	42,3710	26261 0	STCVL	PITCHANG	
2106	REF	1			42,3711	00007 0		URP	
2107					42,3712	51041 0	ECT	RFL	
2108	REF	2	LAST	490	42,3713	06516 0		HILNITZ	
2109	REF	1			42,3714	65721 0		NADJUST	YES, -90 TO +90
2110					42,3715	45345 1	DLCAD	DSU	
2111	REF	4	LAST	485	42,3716	06522 1		HIDPHALF	
2112	REF	4	LAST	490	42,3717	02201 0		PITCHANG	
2113	REF	5	LAST	490	42,3720	02261 0	STCRF	PITCHANG	
2114					42,3721	47375 0	NADJUST	VLDAC	
2115	REF	1			42,3722	00001 0		VXV	$Z = (UR \times URP)$
2116	REF	2	LAST	490	42,3723	00007 0		UR	
2117					42,3724	77772 0	VSL1	URP	
2118	REF	14	LAST	490	42,3725	16205 1	STCEL	RLM	Z VFC E-1
2119	REF	6	LAST	490	42,3726	02201 0		PITCHANG	
2120					42,3727	74356 1	SIN	VXSC	
2121	REF	3	LAST	490	42,3730	06516 0		HILNITZ	
2122					42,3731	71525 0	PDVL	CCS	
2123	REF	7	LAST	490	42,3732	02201 0		PITCHANG	
2124					42,3733	52261 1	VXSC	VLU	
2125	REF	1			42,3734	06522 1		HILNITX	$(UX \cos \alpha) - (UZ \sin \alpha)$
2126					42,3735	63241 0	ECT	PDVL	YAW.Z
2127	REF	15	LAST	490	42,3736	02205 1		RLM	
2128	REF	16	LAST	490	42,3737	02205 1		RLM	
2129					42,3740	75246 0	ARVAL	SIGN	
2130					42,3741	77736 0	ASIN		
2131	REF	2	LAST	485	42,3742	02203 1	STCRF	YAWANG	
2132					42,3743	77776 1	SEANDEX	EXIT	
2133	REF	9	LAST	301	42,3744	31043 1	CA	EXTVBACT	
2134	REF	26	LAST	467	42,3745	74747 0	MASK	BIT5	IS BIT5 STILL ON
2135					42,3746	00006 1	EXTEND		
2136	REF	32	LAST	487	42,3747	15472 1	PZF	ENDEXT	NO
21362	REF	4	LAST	300	42,3750	35017 1	CAF	PRIC5	
21364	REF	7	LAST	477	42,3751	05146 1	TC	PRICFMC	
2137	REF	1			42,3752	33765 0	CAF	VGEN51	DISPLAY ANGLES

L S-BAND ANTENNA FOR LM

LSFF'S PAGE NO. 4 E7 S4

2138	REF	104	LAST	487	42,3753	0 4616 1	TC	BANKCALL	
2139	REF	5	LAST	300	42,3754	20353 1	CADR	GMARKER	
2140	REF	7	LAST	300	42,3755	0 5563 1	TC	B5OFF	TERMINATE
2141	REF	8	LAST	491	42,3756	0 5563 1	TC	B5OFF	PROCEED
2142	REF	67	LAST	477	42,3757	0 5155 0	TC	ENDOFJOB	RECYCLE
2143	REF	24	LAST	459	42,3760	0 4751 0	CAF	RIT3	IMMEDIATE RETURN
2144	REF	8	LAST	300	42,3761	0 5464 1	TC	BLANKET	BLANK R3
2145	REF	4	LAST	300	42,3762	0 4740 0	CAF	PRIC4	
2146	REF	8	LAST	450	42,3763	0 5146 1	TC	PRIOCHNG	
2148	REF	2	LAST	281	42,3764	0 3616 1	TC	SBANDANT	YES, CONTINUE DISPLAYING ANGLES.
2150					42,3765	01463 1	VC6N51	VN	0651
2151					42,3766	26501 1	1CVSORT2	2DEC	.7071067815
2151					42,3767	07463 1			1/SCRIPT(2)
2152					0000		UF	EQUALS	00
2153					0006		URP	EQUALS	6E
2154	REF	6	LAST	473	20,2000			SBANK=	LCWSUPFR

*** END OF LEMONAID.099 ***

L PACAP LEADING ROUTINES

USER'S PAGE NO. 1 END S?

0001 25,2003 BANK 25
 0012 REF 1 25,2000 SETLCC RLEADIN
 0013 25,2003 BANK

0004 REF 7 LAST 216 F4,1600 EBANK= PSTACK

R0005 PACAP SAMPLING LOOP.

0006 REF 1 COUNT* \$4/RLEAD
 0007 REF 7 LAST 280 25,2003 11'777 0 RADSAMP CCS RSAMPCT TIMES NORMAL ONCE-PER-SECOND SAMPLING.
 0008 25,2004 1 2006 1 TCF +2
 0009 REF 15 LAST 470 25,2005 1 5261 0 TCF TASKOVER +0 INSERTED MANUALLY TERMINATES TEST.
 0010 REF 15 LAST 465 25,2006 0 5203 0 TC WAITLIST
 0011 REF 8 LAST 492 E4,1600 EBANK= PSTACK
 0012 REF 2 LAST 278 25,2007 02003 0 2CACP RADSAMP
 0012 25,2010 52064 1
 0013 REF 1 25,2011 3 7716 0 CAF PRI025
 0014 REF 9 LAST 470 25,2012 0 5172 1 TC NVAC
 0015 REF 9 LAST 492 F4,1600 EBANK= PSTACK
 0016 REF 1 25,2013 12023 1 2CACP DCPSAMP
 0016 REF 1 25,2014 52064 1
 0017 REF 47 LAST 478 25,2015 3 4736 1 CAF BIT14 FOR CYCLIC SAMPLING, PTSTDEX =
 0018 25,2016 0 2006 1 EXTEND RTSTLCC/2 + RTSTBASE
 0019 REF 2 LAST 275 25,2017 7 1176 1 MF RTSTLCC
 0020 REF 3 LAST 280 25,2020 6 1775 0 AD RTSTBASE 0 FOR RP, 2 FOR LR.
 0021 REF 5 LAST 275 25,2021 55'773 1 TS RTSTDEX
 0022 REF 16 LAST 492 25,2022 1 5261 0 TCF TASKOVER

R0023 DO THE ACTUAL RADAR SAMPLING.

0024 REF 1 25,2023 0 2060 0 DCRSAMP TC VARADAR SELECTS VARIABLE RADAR CHANNEL.
 0025 REF 105 LAST 491 25,2024 0 4616 1 TC BANKCALL
 0026 REF 4 LAST 265 25,2025 17706 0 CACP RACSTALL
 0027 REF 2 LAST 277 25,2026 25'575 1 INCR RFAILCNT ADVANCE FAIL COUNTER UNTIL ACCEPT RAD DATA
 0028 25,2027 0 3004 0 DCRSAMP2 INHINT
 00281 REF 15 LAST 476 25,2030 3 0101 1 CA FLAGWRES DON'T UPDATE PSTACK IF IN R77.
 00282 REF 3 LAST 281 25,2031 7 4741 0 MASK P77FLBIT
 00283 REF 164 LAST 478 25,2032 10 000 0 CCS A
 00284 REF 1 25,2033 1 2050 1 TCF R771M
 0029 REF 2 LAST 103 25,2034 53'171 1 DXCH SAMPLSUM
 0030 REF 4 LAST 492 25,2035 51'776 0 INDEX RTSTLCC
 0031 REF 10 LAST 492 25,2036 52'601 0 DXCH RSTACK
 00311 REF 32 LAST 472 25,2037 3 0110 1 CA RADMODES
 00312 25,2040 0 0006 1 EXTEND
 00313 REF 7 LAST 419 25,2041 06'133 1 RXCR CHANB3

L RADAR LEADIN ROUTINES

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00314	REF	3F	LAST	464	25,2042	7 4746 1	MASK	BIT6	
00315					25,2043	0 0006 1	EXTEND		
00316	REF	2	LAST	492	25,2044	1 2050 1	BZF	R77IN	
00317	REF	21	LAST	389	25,2045	0 5567 0	TC	ALARM	
00318					25,2046	0 0522 1	CCT	522	
00319	REF	2	LAST	492	25,2047	25 575 1	INCR	REALLOCAT	
0038	REF	5	LAST	492	25,205	4 1776 1	R77IN	CS	RTSTLCC
0039	REF	2	LAST	279	25,2051	6 1774 1	AD	RTSTMAX	CYCLE RTSTLCC
0040					25,2052	0 0006 1	EXTEND		
0041					25,2053	1 2056 1	BZF	+3	
0042	REF	6	LAST	493	25,2054	3 1776 0	CA	RTSTLCC	
0043	REF	32	LAST	460	25,2055	6 4752 0	AD	TWC	STORAGE IS DP
0044	REF	7	LAST	493	25,2056	55 776 1	TS	RTSTLCC	
0045	REF	68	LAST	491	25,2057	1 5155 1	TCF	ENDCFJOB	CONTINUOUS SAMPLING AND 2N TRIES - DONE.

PO056 VARIABLE RADAR DATA CALLER FOR ONE MEASUREMENT ONLY.

0057	REF	60	LAST	472	25,2060	3 4753 1	VARADAR	CAF	ONF	WILL BE SENT TO RADAR ROUTINE IN A BY
0058	REF	5	LAST	476	25,2061	54 133 1	TS	BUF2	SWCALL.	
0059	REF	6	LAST	492	25,2062	51 773 0	INDEX	RTSTDEX		
0060	REF	1			25,2063	3 2065 0	CAF	REPLCCS		
0061	REF	3	LAST	371	25,2064	1 4622 1	TCF	SWCALL	ACT TOUCHING G.	
0062	REF	1			25,2065	53114 0	PERLCCS	CADR	RRRANCE	=0
0063	REF	1			25,2066	53112 0	CADR	PRRECT		=1
0064	REF	1			25,2067	53110 1	CADR	LRVFLX		=2
0065	REF	1			25,2070	53106 0	CADR	LRVELY		=3
0066	REF	1			25,2071	53104 1	CADR	LRVELZ		=4
0067	REF	1			25,2072	53102 1	CADR	LRALT		=5

L P20-P25

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P0001 RENDEZVOUS NAVIGATION PROGRAM 20

R0002 PROGRAM DESCRIPTION

R0003 MOD NO - 2

R0004 BY P. VCLANTE

R0005 FUNCTIONAL DESCRIPTION

R0006

R0007 THE PURPOSE OF THIS PROGRAM IS TO CONTROL THE RENDEZVOUS RADAR FROM
 R0008 STARTUP THROUGH ACQUISITION AND LOCKON TO THE CSM AND TO UPDATE EITHER
 R0009 THE LM OR CSM STATE VECTOR (AS SPECIFIED BY THE ASTRONAUT BY DSKY ENTRY)

R0010 ON THE BASIS OF THE PP TRACKING DATA.

R0011 CALLING SEQUENCE -

R0012

R0013 ASTRONAUT REQUEST THROUGH DSKY V37F20F

R0014 SUBROUTINES CALLED

P0015 R02FCTH (IND STATUS CHECK) FLAGUP

R0016 G0FLASH (PINBALL-DISPLAY) FLAGDOWN

R0017 R23LFM (MANUAL ACQUISITION) BANKCALL

P0018 LS2C1 (ICS DETERMINATION) TASKCVER

R0019 LS2C2 (RANGE LIMIT TEST)

R0020 R41LFM (PREFERRED TRACKING ATTITUDE)

R0021 R21LFM (PR DESIGNATE) ENCODEJOB

R0022 R22LFM (DATA READ) GCPEFF1

R0023 R31LFM (RENDEZVOUS PARAMETER DISPLAY)

R0024 PRICLARM (PRIORITY DISPLAY)

R0025 NORMAL EXIT MODES-

R0026 F2J MAY BE TERMINATED IN TWO WAYS-ASTRONAUT SELECTION OF IDLING

P0027 PROGRAM (P00) BY KEYING V37E00F OR BY KEYING IN V56F

R0028 ALARM OR ABORT EXIT MODES-

R0029 RANGE GREATER THAN 400 NM DISPLAY

R0030 OUTPUT

R0031 TPACKCNT = NO OF RENDEZVOUS TRACKING MARKS TAKEN (CCENTER)

R0032 ERASABLE INITIALIZATION REQUIRED

R0033 FLAGS SET + RESET

R0034 SRCHOPT, RNDVZFLG, ACMDFFLG, VEHUPFLG, UPDATEFLG, TPACKFLG,

R0035 DEBPTS

R0036 CENTRALS-A,Q,L

C037 REF 7 LAST 491 31,2000 SBANK= LOWSUPER FOR LOW 20ADR'S.

C038 33,2045 BANK 33

C039 REF 1 24,2000 SFTLCC P2'S

C040 24,2000 BANK

C041 REF 7 LAST 265 57,1456 EBANK= LOWSCCNT

C042 REF 1 COUNT# 11/P20

C0421 REF 2 LAST 235 24,2100 = PR0G20

C043 REF 1 24,2100 0 5227 1 PR0G20 TC 2PHSCHNG

C044 24,2001 00004 0 CCT 4

C045 24,2002 05022 1 CCT 05022

C046 24,2003 26000 0 CCT 26000

C047 REF 1 24,2004 0 2670 1 TC LUNSFCHK PRIORITY 26
CHECK IF ON LUNAR SURFACE

L- P20-P25

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0048	REF	1		24,2005	0 2007 1	TC	CRCHCG	YES
0049	REF	1		24,2006	0 2036 0	TC	PRCG20A -2	NO - CONTINUE WITH P20
0050	REF	17	LAST	487	24,2007	0 5504 0	CRCHCG	UPFLAC
0051	REF	2	LAST	290	24,2010	0 0026 0	ACRS	VEHUPFLG
0052	REF	61	LAST	493	24,2011	3 4753 1	CAF	CAF
0053	REF	1		24,2012	55 144 0	IS	OPTICN2	SFT R2 FOR OPTION CSM WILL NOT
0054	REF	1		24,2013	3 4363 0	CAF	OPTICN2	CHANGE PRESENT ORBIT
0055	REF	106	LAST	492	24,2014	0 4616 1	TC	BANKCALL
0056	REF	1		24,2015	2 634 1	CADR	GCPEP4	DISPLAY ASSUMED CSM ORBIT OPTION
0057	REF	4	LAST	477	24,2016	0 6001 0	TC	GCPCPCH
0058	REF	1		24,2017	0 2021 0	TC	CRCHG1	TERMINATE
0059				24,2020	0 2013 1	TC	-5	PROCEED VALUE OF ASSUMED OPTION OK
0060	REF	62	LAST	495	24,2021	4 4753 0	CRCHG1	R2 LOADED THRU DSKY
0061	REF	2	LAST	495	24,2022	6 1144 1	AD	OPTICN2
0062				24,2023	0 0016 1	EXTEND		
0063	REF	2	LAST	495	24,2024	1 2040 0	RZF	PRCG20A
0064	REF	1		24,2025	3 2311 0	CAF	V06N33*	
0065	REF	107	LAST	495	24,2026	0 4616 1	TC	BANKCALL
0066	REF	7	LAST	487	24,2027	2 2477 1	CADR	GCFLASH
0067	REF	5	LAST	495	24,2030	0 6001 0	TC	GCPCPCH
0068	REF	1		24,2031	0 2123 0	TC	CRCHG2	FLASH VEPB-NCLN TC REQUEST ESTIMATED
0069				24,2032	0 2025 1	TC	-5	TIME OF LAUNCH
0070	REF	31	LAST	488	24,2033	0 6142 1	CRCHG2	TERMINATE
0071				24,2034	7 7650 1	TC	INTPRET	PROCEED VALUES OK
0072	REF	1		24,2035	6 4217 1	GCIC		TIME LOADED THRU DSKY
0073				32,2217		BANK	32	
0074	REF	1		32,2200		SETLOC	P20S4	
0075				32,2217		BANK		
0076	REF	1				CLCNT*	44/P20	
0077				32,2217	7 7624 1	ORCHG3	CALL	
0078	REF	5	LAST	298	32,2220	2 7412 0		INSTALL
0079				32,2221	7 7745 1	DLCAD		
0080	REF	8	LAST	307	32,2222	0 3442 0		TIG
00801	REF	2	LAST	149	32,2223	0 3661 0	STORE	LACHTM
0081	REF	7	LAST	489	32,2224	0 0041 1	STORE	TCECL
0082				32,2225	4 3214 0	CLEAR		ESTIMATED LAUNCH TIME
0083	REF	4	LAST	237	32,2226	0 1674 0	CLEAR	VINTFLAG
0084	REF	1		32,2227	0 1673 1	CLEAR	INTYPELG	LM INTEGRATION
0085				32,2230	4 3014 0	CLEAR	CLEAR	PRECISION - ENCKE
0086	REF	3	LAST	237	32,2231	0 1676 1	CLEAR	DIMFLAG
0087	REF	2	LAST	237	32,2232	0 1675 1	CLEAR	D6CR9FLG
0088				32,2233	7 7624 1	CALL		
0089	REF	3	LAST	237	32,2234	2 7135 0	CALL	INTEGRV
0090				32,2235	7 7624 1	CALL		PLANETARY INERTIAL ORIENTATION
0091	REF	1		32,2236	1 1226 1		GRP2PC	
0092				32,2237	7 7775 1	VICAD		
0093	REF	2	LAST	210	32,2240	0 0017 1		RATT1
0094	REF	2	LAST	149	32,2241	1 7631 0	STCDL	RSUBL
0095	REF	4	LAST	489	32,2242	0 0015 0	TAT	SAVE LM POSITION

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0096	REF	8	LAST	495	32,2243	34041 0	STCALL	TCFC1	
0097	REF	6	LAST	495	32,2244	27412 0		INTSTALL	
0098					32,2245	43014 0	SET	CLEAR	
0099	REF	5	LAST	495	32,2246	01474 1		VINTFLAG	CSM INTEGRATION
0100	REF	2	LAST	495	32,2247	01673 1		INTYPELG	
0101					32,2250	43014 0	CLEAR	BCFF	
0102	REF	4	LAST	495	32,2251	01676 1		DIMDFLAG	
0103	REF	3	LAST	237	32,2252	02756 1		RENDWFLG	W MATRIX VALID
0104	REF	1			32,2253	64257 0		NCWMATX	AC
0105					32,2254	43014 0	SET	SFT	YES - SFT FCP W MATRIX
0106	REF	5	LAST	496	32,2255	01476 0		PIMDFLAG	
0107	REF	3	LAST	495	32,2256	01475 0		D6CR9FLG	
0108					32,2257	77624 1	NCWMATX	CALL	
0109	REF	4	LAST	495	32,2260	27135 0		INTEGRV	CSM INTEGRATION
0110					32,2261	77624 1	CALL		
0111	REF	2	LAST	495	32,2262	11226 1		GRP2PC	
0112					32,2263	77775 1	VLCAD		
0113	REF	6	LAST	210	32,2264	00025 0		VATT1	
0114	REF	1			32,2265	25761 0	STOVL	VSUBC	SAVE CSM VELOCITY
0115	REF	2	LAST	495	32,2266	00017 1		RATT1	
0116	REF	1			32,2267	01101 0	STORE	RSUBC	SAVE CSM POSITION
0117					32,2270	53435 0	VXV	UNIT	COMPUTE NORMAL TO CSM ORBITAL PLANE
0118	REF	2	LAST	496	32,2271	01761 0		VSUBC	NSLB1=UNIT(R(CM) CROSS V(CM)
0119					32,2272	24025 0	STOVL	200	SAVE NSLB1
0120	REF	2	LAST	495	32,2273	03631 0		RSUBC	COMPUTE ESTIMATED ORBITAL
0121					32,2274	53435 0	VXV	UNIT	PLANE CHANGE
0122					32,2275	00025 0		200	UCSM = UNIT(R(LM) CROSS NSLB1)
0123	REF	2	LAST	149	32,2276	27637 0	STOVL	LCSM	
0124	REF	2	LAST	496	32,2277	01101 0		RSUBC	COMPUTE ANGLE BETWEEN LCSM
0125					32,2280	50256 0	UNIT	DCT	AND RSUBC
0126	REF	3	LAST	496	32,2301	03637 0		UCSM	CCS A = LCSM DCT UNIT (R(CM))
0127					32,2302	77752 1	SL1		
0128	REF	2	LAST	126	32,2303	02732 0	STORE	CSTH	SAVE CCF TIME-THETA SUBROUTINE
0129					32,2304	44315 0	DSQ	BDSU	COMPUTE SINE A
0130	REF	1			32,2305	06514 1		CNRP-2	
0131					32,2306	77766 0	SQRT		
0132	REF	2	LAST	126	32,2307	26730 1	STOVL	SNTH	SAVE FOR TIME-THETA SUBROUTINE
0133	REF	3	LAST	496	32,2310	01101 0		RSUBC	POSITION OF CSM AT EST. LAUNCH
0134	REF	1			32,2311	26655 0	STOVL	RVFC	TIME FOR TIME-THETA E-27
0135	REF	3	LAST	496	32,2312	01761 0		VSUBC	VELOCITY OF CSM AT EST. LAUNCH
0135I					32,2313	77676 0	VCCMP		
0136	REF	2	LAST	126	32,2314	02744 1	STORE	VVEC	TIME FOR TIME THETA E-5
0137					32,2315	45014 0	CLEAR	CALL	
0138	REF	1			32,2316	02666 1		RVSU	
0139	REF	1			32,2317	24732 1		TIMETHET	
0139I					32,2320	77676 0	VCCMP		
0140	REF	2	LAST	149	32,2321	03645 0	STOPE	NEWVEL	TERMINAL VELOCITY OF CSM
0140I					32,2322	77745 1	CLOAD		
01402	REF	1			32,2323	00037 0		T	
01403	REF	2	LAST	149	32,2324	27663 1	STOVL	TRANSTM	TRANSFER TIME

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01414	REF	3	LAST	496	32,2325	03645 0		NEWVEL	
0141					22,2326	77646 0	ARVAL		
01411					32,2327	24025 0	STCVL	200	
0142					22,2330	00001 0		00	
0143	REF	2	LAST	149	32,2331	03653 1	STORE	NEWPOS	TERMINAL POSITION OF CSM
0144					32,2332	53435 0	VXV	UNIT	COMPUTE NORMAL TO CSM ORBITAL PLANE
0145	REF	4	LAST	496	32,2333	03631 0		RSLBL	NSLP2 = UNIT(NEWPCS CROSS R(LM))
0146					32,2334	53435 0	VXV	UNIT	ROTATE TERMINAL VEL INTO DESIRED
0147	REF	3	LAST	497	22,2335	03653 1		NEWPCS	ORBITAL PLANE
0148					32,2336	76561 1	VXSC	VSL1	VSLBC = ABVAL(NEWVEL) * UNIT(NSUE2
0149					32,2337	00025 0		200	
0150	REF	1			22,2340	37665 0	STCALL	NCSMVEL	NEW CSM VELOCITY
0151	REF	3	LAST	496	32,2341	11226 1		GRP2PC	
0152					32,2342	77624 1	CALL		
0153	REF	7	LAST	496	32,2342	27412 0		INSTALL	
0154					32,2344	44345 0	CLDPC	BDSU	
0155	REF	3	LAST	496	22,2345	03663 1		TRANSTM	LAUNCH TIME - TRANSFER TIME
01551	REF	3	LAST	495	32,2346	03661 0		LNCHTM	
0156	REF	4	LAST	321	32,2347	25517 0	STCVL	TET	
0157	REF	4	LAST	497	22,2350	03652 1		NEWPCS	
0158	REF	4	LAST	322	32,2351	01535 0	STORE	RCV	
0159	REF	2	LAST	111	32,2352	25503 0	STCVL	RRECT	
0160	REF	2	LAST	497	22,2353	03665 1		NCSMVEL	
0161	REF	2	LAST	111	32,2354	35511 1	STCALL	VRECT	
0162	REF	1			22,2355	27707 1		MINIPFCT	
01621					32,2356	45174 1	AXT,2	CALL	
01622					32,2357	00002 0		2	
0163	REF	2	LAST	37	32,2360	26662 1		ATCFCSM	
0164					32,2361	77624 1	CALL		
0165	REF	1			22,2362	27421 0		INTWAKE	
0166					32,2363	77776 1	EXIT		
0167	REF	108	LAST	495	32,2364	04616 1	TC	BANKCALL	
0168	REF	3	LAST	495	22,2365	50040 0	CACR	PRCG204	
0169					24,2036		BANK	24	
0170	REF	2	LAST	494	24,2036		SFTLCC	P20S	
0171					24,2036		BANK		
0172	REF	2	LAST	494 TC	495:	30 30*	CCUNT*	\$4/P20	
0173	REF	36	LAST	476	24,2036	05516 0	TC	CCWNFLAG	RESET VEHUPFLG- LM STATE VECTOR
0174	REF	4	LAST	495	24,2037	00026 0	ADRES	VEHUPFLG	TC BE UPDATED
0175	REF	109	LAST	497	24,2040	04616 1	TC	BANKCALL	
0176	REF	2	LAST	340	24,2041	11236 0	CACR	R12BOTH	
0177	REF	18	LAST	495	24,2042	05504 0	TC	UPFLAG	
0178	REF	2	LAST	288	24,2043	00027 1	APFES	UPCATFLG	SET UPDATE FLAG
0179	REF	19	LAST	497	24,2044	05514 0	TC	UPFLAG	
0180	REF	2	LAST	288	24,2045	00031 0	APFES	TRACKFLG	SET TRACK FLAG
0181	REF	20	LAST	497	24,2046	05504 0	TC	UPFLAG	
0182	REF	2	LAST	288	24,2047	00010 0	ADRES	RADVZFLG	SET PENDEZVCUS FLAG
0183	REF	37	LAST	497	24,2050	05516 0	TC	CCWNFLAG	
0184	REF	2	LAST	288	24,2051	00037 0	ADRES	SRCHCPTN	INSURE SEARCH OPTION OFF

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0185	REF	38	LAST	497	24,2052	0 5516 0	TC	DOWNFLAG	ALSO MANUAL ACQUISITION FLAG RESET
0186	REF	1			24,2053	00040 0	ADRES	ACMCCFLG	
0187	REF	39	LAST	498	24,2054	0 5516 0	TC	DOWNFLAG	TURN OFF R04FLAG TO ENSURE GETTING
0188	REF	5	LAST	280	24,2055	00063 1	ADRES	R04FLAG	ALARM 521 IF CANT READ RADAR
0189	REF	40	LAST	498	24,2056	0 5516 0	TC	DOWNFLAG	ENSURE P25 GIMBAL MONITOR IS ENABLED
0190	REF	3	LAST	271	24,2057	01126 1	ADRES	NCPRMON	(RESET NCPRMON FLAG)
0191	REF	41	LAST	498	24,2060	0 5516 0	TC	DOWNFLAG	RESET LCS BEING COMPUTED FLAG
0192	REF	1			24,2061	00041 1	ADRES	LSCHMFLG	
0193	REF	5	LAST	289	24,2062	0 6111 1	TC	CLPACMODE	
0195	REF	6	LAST	477	24,2063	0 5353 1	P20LEMI TC	PHASCHNG	
0196					24,2064	04022 0	CCT	04022	
0197	REF	106	LAST	473	24,2065	3 4755 1	CAF	ZEPD	ZERO MARK COUNTER
0198	REF	1			24,2066	55162 1	TS	MARKCTR	
0199	REF	32	LAST	495	24,2067	0 6142 1	TC	INTPRET	LCS DETERMINATION POLTIME
0200					24,2070	77634 0	RTB		
0201	REF	6	LAST	489	24,2071	21574 1		LCADTIME	
0202	REF	9	LAST	456	24,2072	34041 0	STCALL	TEEC1	
0203	REF	1			24,2073	51255 1		LPS20.1	
0204					24,2074	77624 1	CALL		
0205	REF	1			24,2075	53551 1		LPS20.2	TEST RANGE R/LTIME
0206					24,2076	77776 1	EXIT		
0207	REF	236	LAST	477	24,2077	50154 1	INDEX	MPAC	
0208					24,2100	0 2101 0	TC	+1	
0209	REF	1			24,2101	0 2111 1	TC	P20LEMA	NORMAL RETURN WITHIN 400 N.M
0210	REF	1			24,2102	3 2305 0	526ALARM CAF	ALPM526	ERROR EXIT - RANGE > 400 N.M.
0211	REF	110	LAST	497	24,2103	0 4616 1	TC	RANKCALL	
0212	REF	1			24,2104	21563 1	CAF	PRIOLARM	
0213	REF	2	LAST	477	24,2105	0 6025 0	TC	GCTCV56	TERMINATE EXITS P20 VIA V56 CODING
0214					24,2106	0 2102 0	TC	-4	PRIC (ILLEGAL
0215	REF	1			24,2107	0 2063 0	TC	P20LEMI	ENTER RECYCLE
0216	REF	69	LAST	493	24,2110	0 5155 0	TC	ENDCFJCP	
0217	REF	7	LAST	498	24,2111	0 5353 1	P20LEMA TC	PHASCHNG	
0218					24,2112	04022 0	CCT	04022	
0219	REF	2	LAST	494	24,2113	0 2670 1	TC	LLNSFCHK	CHECK LUNAR SURFACE FLAG (P22 FLAG)
0220	REF	1			24,2114	0 2117 1	TC	P20LEMB	
0221	REF	111	LAST	498	24,2115	0 4616 1	TC	RANKCALL	
0222	REF	1			24,2116	46116 0	CAF	R41LEM	PREFERRED TRACKING ATTITUDE ROUTINE
0223	REF	8	LAST	498	24,2117	0 5353 1	P20LEMP TC	PHASCHNG	
0224					24,2120	05022 1	CCT	05022	RESTART AT PRIORITY 10 TO ALLOW V27
0225					24,2121	10000 0	CCT	10000	REQUESTED PROGRAM TO RUN FIRST
0226	REF	3	LAST	477	24,2122	3 7717 1	CAF	PRIC26	RESTORE PRIORITY 26
0227	REF	9	LAST	491	24,2123	0 5146 1	TC	PRICCHNG	
02272	REF	16	LAST	477	24,2124	3 7775 0	CA	FLAGWPD1	IS THE TRACK FLAG SET
02274	REF	4	LAST	477	24,2125	7 4747 0	MASK	TRACKFIT	
02276					24,2126	0 0006 1	EXTEND		
02278	REF	1			24,2127	1 2232 1	BZF	P20LEMT	BRANCH - NO - WAIT FOR IT TO BE SET
0228	REF	26	LAST	459	24,2130	3 4752 0	P20LEMB7 CAF	RIT2	IS RF AUTO MODE DISCRETE PRESENT
0229					24,2131	0 0006 1	EXTEND		

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0230	REF	8	LAST	492	24,2132	02 033 0	RAND	CHAN33	
0231					24,2133	0 0076 1	EXTEND		
0232	REF	1			24,2134	1 2170 1	BZF	P20LEMB3	YES - DC AUTOMATIC ACQUISITION (R21)
0233	REF	4	LAST	297	24,2135	4 6007 1	P20LEMB5	CS	PCT24
0234	REF	9	LAST	477	24,2136	6 1010 1	AD	MODREG	PARAN ACT IN AUTO CHECK IF
0235					24,2137	0 0006 1	EXTEND		MAJOR MODE IS 20
0236	REF	1			24,2140	1 2153 0	BZF	P20LEMB6	BRANCH - YES-CK TO DC PLEASE PERFORM
02363	REF	3	LAST	405	24,2141	6 7751 0	AC	NEC2	ALSO CHECK FOR P22
02366					24,2142	0 0076 1	EXTEND		
02369	REF	2	LAST	499	24,2143	1 2153 0	BZF	P20LEMB6	BRANCH - YES CK TO DC PLEASE PERFORM
0241	REF	1			24,2144	3 2307 1	CAF	ALRM514	TRACK FLAG SET-FLASH PRIORITY ALARM 514-
0242	REF	112	LAST	498	24,2145	0 4616 1	TC	BANKCALL	PARAN GCES CUT OF AUTO MODE WHILE IN USE
0243	REF	2	LAST	498	24,2146	21563 1	CADR	PRICLARM	
0244	REF	3	LAST	498	24,2147	0 6025 0	TC	GOTCV56	TERMINATE EXITS VIA V56
0245	REF	2	LAST	498	24,2150	0 2117 1	TC	P20LEMB	PROCEED AND ENTER BCTF GC BACK
0246	REF	3	LAST	498	24,2151	0 2117 1	TC	P20LEMB	TO CHECK AUTO MODE AGAIN
0247	REF	70	LAST	498	24,2152	0 5155 0	TC	ENDCFJCB	
0248	REF	1			24,2153	3 2306 0	P20LEMB6	CAF	PCT201
0249	REF	112	LAST	498	24,2154	0 4616 1	TC	BANKCALL	REQUEST PR AUTO MODE SELECTION
0250	REF	1			24,2155	0 6024 0	CADR	GCPREF1	
0251	REF	4	LAST	499	24,2156	0 6025 0	TC	GOTCV56	TERMINATE EXITS P20 VIA V56 CODING
0252	REF	4	LAST	498	24,2157	0 2117 1	TC	P20LEMB	PROCEED CHECKS AUTO MODE DISCRETE AGAIN
0253	REF	3	LAST	498	24,2160	0 2670 1	TC	LUNSECHK	ENTER INDICATES MANUAL ACQUISITION (R23)
0254	REF	1			24,2161	0 2166 1	TC	P20LEMB2	YES - R22 NOT ALLOWED-TURN ON CPR ERROR
0255	REF	1			24,2162	0 3136 0	TC	R23LEM	NO - DC MANUAL ACQUISITION
0256	REF	21	LAST	497	24,2163	0 5574 0	P20LEMB1	TC	UPFLAG
0257	REF	2	LAST	498	24,2164	0 0040 0	ADRES	ACMODELG	RETURN FROM P23 - LOCKEN ACHIEVED
0258	REF	5	LAST	499	24,2165	0 2117 1	TC	P20LEMB	SET MANUAL FLAG AND GO BACK TO CHECK
									RF AUTO MODE
0259	REF	6	LAST	448	24,2166	0 4364 1	P20LEMB2	TC	FALTCN
0260	REF	6	LAST	499	24,2167	0 2117 1	TC	P20LEMB	TURNS ON OPERATOR ERROR LIGHT ON DESKY
									AND GCES BACK TO CHECK AUTO MODE
0261	REF	33	LAST	492	24,2170	4 0117 0	P20LEMB3	CS	RADMODES
0262	REF	1			24,2171	7 4737 1	MASK	RCDUPBIT	ARE PR CDLS BEING ZERFCD
0263					24,2172	0 0006 1	EXTEND		
0264	REF	1			24,2173	1 2205 0	BZF	P20LEMB4	BRANCH - YES - WAIT
0265	REF	5	LAST	294	24,2174	3 4355 0	CAF	BIT13-14	IS SEARCH OR MANUAL ACQUISITION FLAG SET
0266	REF	7	LAST	335	24,2175	7 0076 1	MASK	FLAGWRD2	
0267					24,2176	0 0006 1	EXTEND		
0268	REF	1			24,2177	1 2211 0	BZF	P20LEMB3	ZERF MEANS AUTOMATIC PR ACQUISITION
0269	REF	42	LAST	498	24,2178	0 5516 0	TC	DOWNFLAG	RESET TO AUTO MODE
0270	REF	3	LAST	497	24,2201	0 0037 0	ADRES	SACFCPTN	

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0271	REF	43	LAST	499	24,2202	0 5516 0	TC	DOWNFLAG	
0272	REF	3	LAST	499	24,2203	0 0040 0	ADRES	ACMCCFLE	
0273	REF	2	LAST	498	24,2204	0 2232 0	TC	P20LEMT	WAIT 2.5 SECONDS THEN GO TO RR DATA READ

0274	REF	1			24,2205	3 2304 1	P20LEMB4	CAF	250DEC	
0275	REF	114	LAST	499	24,2206	0 4615 1	TC	RANKCALL	WAIT 2.5 SECONDS WHILE RR CTUS ARE BEING	
0276	REF	7	LAST	301	24,2207	0 1736 1	CADR	DELAYJOB	ZEROED-THEN GO BACK AND CHECK AGAIN	
0277	REF	2	LAST	499	24,2210	0 2170 0	TC	P20LEMB3		

027705	REF	33	LAST	498	24,2211	0 6042 1	P20LEMC3	TC	INTPRET	
02771					24,2212	7 7634 0	PTB			
027715	REF	7	LAST	498	24,2213	2 1574 1			LCACTIME	
02772	REF	10	LAST	498	24,2214	3 4041 0		STCALL	TDEC1	
027725	REF	1			24,2215	5 0312 1			UPPSV	
02775					24,2216	7 7776 1	P20LEMC4	EXIT		
0278	REF	9	LAST	498	24,2217	0 5353 1	P20LEMC	TC	PHASCHNG	
0279					24,2220	0 4022 0	CCT	04022		
0280	REF	20	LAST	477	24,2221	3 0074 1	CAF	FLAGWRD0	IS THE RENDEZVOUS FLAG SET	
0281	REF	4	LAST	477	24,2222	7 4745 1	MASK	RNDVZBIT		
0282					24,2223	0 0006 1		EXTEND		
0283	REF	71	LAST	499	24,2224	1 5155 1	BZF	ENDOFJOB	NO - EXIT P20	
0284	REF	17	LAST	498	24,2225	3 0075 0	CAF	FLAGWRD1	IS TRACK FLAG SET (BIT 5 FLAGWRD 1)	
0285	REF	5	LAST	498	24,2226	7 4747 0	MASK	TRACKBIT		
0286					24,2227	0 0006 1		EXTEND		
0287	REF	1			24,2230	1 2264 1	BZF	P20LEMD	BRANCH-TRACK FLAG NOT ON-WAIT 15 SECONDS	
0288	REF	1			24,2231	0 2675 1	P20LEMF	TC	R21LEN	

0291	REF	2	LAST	500	24,2232	3 2304 1	P20LEMT	CAF	250DEC	
0293	REF	5	LAST	385	24,2233	0 5173 1	TC	TWIDDLE	USE INSTEAD OF WAITLIST SINCE SAME BANK	
0294	REF	2	LAST	240	24,2234	0 2244 1	ADRES	P20LEMC1	WAIT 2.5 SECONDS	
0295	REF	18	LAST	500	24,2235	3 0075 0	CAF	FLAGWRD1	IS TRACK FLAG SET	
0296	REF	6	LAST	500	24,2236	7 4747 0	MASK	TRACKBIT		
0297					24,2237	0 0006 1		EXTEND		
0298	REF	72	LAST	500	24,2240	1 5155 1	BZF	ENDOFJOB	NO-EXIT WITHOUT DOING 2.7 PHASE CHANGE	
0299	REF	10	LAST	500	24,2241	2 5353 1	P20LEMT1	TC	PHASCHNG	
0300					24,2242	4 0072 0	CCT	40072		
0301	REF	73	LAST	500	24,2243	0 5155 0	TC	ENDOFJOB		

0302	REF	21	LAST	500	24,2244	3 0074 1	P20LEMC1	CAF	FLAGWRD0	IS RENDEZVOUS FLAG SET
0303	REF	5	LAST	500	24,2245	7 4745 1	MASK	RNDVZBIT		
0304					24,2246	0 0006 1		EXTEND		
0305	REF	17	LAST	492	24,2247	1 5261 0	BZF	TASKOVER	NO - EXIT P20/R22	
0306	REF	19	LAST	500	24,2250	3 0075 0	CAF	FLAGWRD1	IS TRACK FLAG SET	
0307	REF	7	LAST	500	24,2251	7 4747 0	MASK	TRACKBIT		
0308					24,2252	0 0006 1		EXTEND		
0309	REF	1			24,2253	1 2261 1	BZF	P20LEMC2	NO-DO NOT SCHEDULE R22 JOB	

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0311	REF	4	LAST	498	24,2254	3 7717 1	CAF	PRIC26	YES-SCHEDULE R22 JCB (RR DATA READ)
0311	REF	17	LAST	463	24,2255	0 5115 0	TC	FINDVAC	
0312	REF	8	LAST	494	27,1456		EBANK=	LCSCCLNT	
0313	REF	1			24,2256	02631 1	2CADP	R22LEMC2	
0313	REF	1			24,2257	50067 0			
0314	REF	18	LAST	500	24,2260	0 5261 1	TC	TASKOVER	

0315	REF	1			24,2261	0 5221 0	P20LEMC2	TC	FIXDELAY	TRACK FLAG NOT SET ,WAIT 15 SECONDS
0316					24,2262	0 2734 0		DFC	1500	AND CHECK AGAIN

0317	REF	3	LAST	500	24,2263	0 2244 1		TC	P20LEMC1	
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0318	REF	1			24,2264	3 2667 1	P20LEMC2	CAF	1500DFC	
0319	REF	6	LAST	500	24,2265	0 5173 1		TC	TWIDDLE	WAITLIST FOR 15 SECONDS

0320	REF	1			24,2266	0 2270 0		ADRES	P20LEMC1	
0321	REF	74	LAST	500	24,2267	0 5155 0		TC	ENDOFJCB	

0322	REF	20	LAST	500	24,2270	30 075 0	P20LEMC1	CAF	FLAGWRD1	IS TRACK FLAG SET
0323	REF	9	LAST	500	24,2271	7 4747 0		MASK	TRACKBIT	
0324	REF	165	LAST	492	24,2272	10 010 0		CCS	A	
0325	REF	1			24,2273	1 2277 0		TCF	P20LEMC2	YES-SCHEDULE DESIGNATE JCB
0326	REF	2	LAST	501	24,2274	0 5221 0		TC	FIXDELAY	NO-WAIT 15 SECONDS
0327					24,2275	0 2734 0		DFC	1500	
0328	REF	2	LAST	501	24,2276	0 2271 0		TC	P20LEMC1	

0329	REF	5	LAST	501	24,2277	3 7717 1	P20LEMC2	CAF	PRIC26	SCHEDULE JCB TO DO R21
0330	REF	18	LAST	501	24,2300	0 5115 0		TC	FINDVAC	
0331	REF	9	LAST	501	27,1456			EBANK=	LCSCCLNT	
0332	REF	2	LAST	499	24,2311	0 2211 1		2CADR	P20LEMC3	START AT PERM. MEMORY INTEGRATION
0332					24,2312	50067 0				
0333	REF	19	LAST	501	24,2313	0 5261 1		TC	TASKOVER	

0334					24,2314	0 0372 1	250DEC	DEC	250	
0335					24,2315	0 0526 0	ALRM526	CCT	00526	
0336					24,2316	0 0201 1	OCT201	CCT	00201	
0337					24,2317	0 0514 1	ALRM514	CCT	514	
0338					24,2318	0 0074 1	MAXTRIES	DEC	60	
0339	REF	3	LAST	472	4363		OCT0012	EQUALS	91NCCN	
0341	REF	2	LAST	353	23,2513		CMR-2	EQUALS	CPI/4TH	
03415					24,2311	0 1441 1	VC6N33*	VN	0633	
0342					24,2312	45120 1	UPPSV	STQ	CALL	UPDATES PERMANENT STATE VECTORS
0343	REF	1			24,2313	0 1757 0			LS21X	TC PRESENT TIME
0344	REF	8	LAST	497	24,2314	27412 0			INSTALL	
0345					24,2315	77624 1		CALL		
0346	REF	2	LAST	237	24,2316	26645 1			SETIFLGS	
0347					24,2317	43014 0		BOF	SET	IF W-MATRIX INVALID,DO NOT INTEGRATE IT

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0348	REF	4	LAST	496	24,2321	02756 1		PENDWFLG	
0349	REF	1			24,2321	50332 0		UPPSV1	
0350	REF	6	LAST	496	24,2322	01476 0		DIMOFLEG	SET DIMCFLAG TO INTEGRATE W-MATRIX
0351					24,2323	43014 0	ECN	SET	
0352	REF	4	LAST	253	24,2324	04307 1		SURFFLAG	IF ON LUNAR SURFACE W IS 6X6
0353	REF	1			24,2325	50327 1		UPPSV5	
0354	REF	4	LAST	496	24,2326	01475 0		D6CR9FLG	OTHERWISE 5X9
0355					24,2327	77614 1	LPPSV5	END	
0356	REF	5	LAST	497	24,2330	00747 0		VEHUFFLG	
0357	REF	1			24,2331	50364 0		UPPSV3	
0358					24,2332	77614 1	LPPSV1	SFT	
0359	REF	6	LAST	496	24,2333	01474 1		VINTFLAG	
0361					24,2334	77624 1		CALL	
0362	REF	5	LAST	496	24,2335	27135 0		INTEGRV	
0363					24,2336	77624 1		CALL	GROUP 2 PHASE CHANGE
0364	REF	4	LAST	497	24,2337	11226 1		GRP2PC	TO PROTECT INTEGRATION
0365					24,2340	77624 1		CALL	
0366	REF	9	LAST	511	24,2341	27412 0		INTSTALL	
0367					24,2342	43145 0		DLCAD	
0368	REF	4	LAST	237	24,2343	01571 0		CLEAR	GET TETCSM TO STORE IN TDEC FOR LM INT.
0369	REF	7	LAST	502	24,2344	01674 0		TETCSM	
0370					24,2345	77624 1	UPPSV4	VINTFLAG	
0371	REF	3	LAST	501	24,2346	26645 1		CALL	INTEGRATE OTHER VEHICLE
0372	REF	11	LAST	500	24,2347	34041 0		WITHOUT W-MATRIX	
0373	REF	6	LAST	502	24,2350	27135 0		SETIFLG	
0374					24,2351	77214 0	STCALL	TDEC1	
0375	REF	5	LAST	512	24,2352	04347 0	BOFF	INTEGRV	
0376	REF	1			24,2353	50216 1		VLCAD	
0377	REF	1			24,2354	01661 1		SURFFLAG	
0378					24,2355	77742 0		P2CLENC4	
0379	REF	1			24,2356	26352 1	VSR2	RCVLEM	
0380	REF	1			24,2357	01667 1	STCVL	LMPOS	
0381					24,2360	77742 0		VCVLEM	
0382	REF	1			24,2361	02361 0	VSR2		
0383					24,2362	77650 1	STORE	LMVFL	
0384	REF	2	LAST	501	24,2363	01757 0	COTC	LS21X	
0385					24,2364	45314 0	UPPSV3	CLEAR	
0386	REF	8	LAST	502	24,2365	01674 0		CALL	
0387	REF	7	LAST	502	24,2366	27135 0		VINTFLAG	
0388					24,2367	77624 1		INTEGRV	
0391	REF	5	LAST	502	24,2370	11226 1		CALL	
0392					24,2371	77624 1		GRP2PC	
0393	REF	10	LAST	502	24,2372	27412 0		CALL	
0394					24,2373	71214 0		INTSTALL	
0395	REF	9	LAST	502	24,2374	01474 1		SET	
0396	REF	2	LAST	112	24,2375	01643 1		DLCAD	
0397					24,2376	77650 1		VINTFLAG	
0398	REF	1			24,2377	50345 0	GOTC	TETLEM	GET TETLEM TO STORE IN TDEC FOR CSM INT.
								UPPSV4	

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0399	REF	10	LAST	501	E7.1456
0400	REF	1			

FBANK=	LCSCOUNT
COUNT*	\$4/P22

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R0401 PROGRAM DESCRIPTION
R0402 PREFERRED TRACKING ATTITUDE PROGRAM P25
R0403 MOD NO - 3

R0404 BY P. VCLANTE
R0405 FUNCTIONAL DESCRIPTION
R0406

R0407 THE PURPOSE OF THIS PROGRAM IS TO COMPUTE THE PREFERRED TRACKING
R0408 ATTITUDE OF THE LM TO CONTINUOUSLY POINT THE LM TRACKING BEACON AT THE
R0409 CSM AND TO PERFORM THE MANEUVER TO THE PREFERRED TRACKING ATTITUDE AND

R0410 CONTINUOUSLY MAINTAIN THIS ATTITUDE WITHIN PRESCRIBED LIMITS
R0411 CALLING SEQUENCE -

R0412 ASTRONAUT REQUEST THROUGH DSKY V37E25E

R0413 SUBROUTINES CALLED -

R0414 BANKCALL FLAGLE
R0415 R02E0TH (IMU STATUS CHECK) ENDDJOB

R0416 R61LEW (PREF TPK ATT RCUT) WAITLIST
R0417 TASKOVER FINCVAC

R0418 NORMAL EXIT MODES -

R0419 P25 MAY BE TERMINATED IN TWO WAYS-ASTRONAUT SELECTION OF IDLING

R0420 PROGRAM(P03) BY KEYING V37E0E OR BY KEYING IN V5EE

R0421 ALARM OR ABORT EXIT MODES -

R0422 NONE

R0423 OUTPUT

R0424 ERASABLE INITIALIZATION REQUIRED

R0425 FLAGS SET + RESET

R0426 TRACKFLG, P25FLAG

R0427 DEBRIS

R0428 NONE

R0429 REF 11 LAST 503 F7,1456

R0430 REF 1 COUNT* 11/P25

R0431 REF 2 LAST 494 24,2400 0 5327 1 PROG25 TC 2PHSCHNG

R0432 24,2401 00004 0 OCT 4 MAKE GROUP 4 INACTIVE (VERB 37)

R0433 24,2402 05022 1 OCT 05022

R0434 24,2403 26007 0 OCT 26007 EFFICITY 26

R0435 REF 11F LAST 500 24,2404 0 4616 1 TC BANKCALL

R0436 REF 2 LAST 497 24,2405 11236 0 CAGR R02E0TH IMU STATUS CHECK

R0437 REF 22 LAST 496 24,2406 0 5504 0 TC UPFLAG

R0438 REF 3 LAST 497 24,2407 00031 0 ADRES TRACKFLG SET TRACK FLAG

R0439 REF 23 LAST 504 24,2410 0 5504 0 TC UPFLAG

R0440 REF 2 LAST 288 24,2411 00006 1 ADRES P25FLAG SET P25FLAG

R04402 *REF 44 LAST 500 24,2412 0 5516 0 TC DOWNFLAG

R04404 *REF 3 LAST 497 24,2413 00010 0 ADRES RNDVZFLG

R0441 REF 11 LAST 500 24,2414 0 5353 1 P25LEM1 TC PHASCHNG

R0442 24,2415 04022 0 OCT 04022

R0443 REF 2 LAST 220 24,2416 3 4743 0 CAGR P25FLBIT

R0444 REF 31 LAST 236 24,2417 7 0074 0 MASK STATE IS P25FLAG SET

R0445 24,2420 0 0006 1 EXTEND

R0446 REF 75 LAST 501 24,2421 1 5155 1 BZF ENDDJOB

R0447 REF 9 LAST 501 24,2422 3 4747 1 CAGR TRACKBIT IS TRACKFLAG SET?

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0448	REF	32	LAST	504	24,2422	7 0075 1	MASK	STATE +1	
0449					24,2424	0 0006 1	EXTEND		
0450	REF	1			24,2425	1 2433 0	BZF	P25LMWT1	NO-SKIP PHASE CHANGE AND WAIT 1 MINUTE
0451	REF	7	LAST	458	24,2426	3 4757 0	CAF	SEVEN	CALL R65 - FINE PREFERRED
0452	REF	1			24,2427	55'745 1	TS	R65CNTR	
0453	REF	116	LAST	504	24,2430	0 4616 1	TC	BANKCALL	TRACKING ATTITUDE ROUTINE
0454	REF	1			24,2431	46123 0	CADR	R65LEM	
0455	REF	2	LAST	240	24,2432	0 2414 1	TC	P25LEM1	THEN GO CHECK FLAGS
0458	REF	1			24,2433	3 2444 1	P25LMWT1 CAF	60SCNDS	
0460	REF	7	LAST	501	24,2434	0 5173 1	TC	TWIDDLE	WAIT ONE MINUTE THEN CHECK AGAIN
0461	REF	1			24,2435	0 2437 0	AFRES	P25LEM2	
0462	REF	76	LAST	504	24,2436	0 5155 0	TC	ENDCFJCB	
0463	REF	1			24,2437	3 5024 1	P25LEM2 CAF	PRIC14	
0464	REF	19	LAST	501	24,2440	0 5105 0	TC	FINDVAC	
0465	REF	12	LAST	504	57,1456		EBANK=	LCSCCNT	
0466	REF	3	LAST	505	24,2441	0 2414 1	ZCADR	P25LFM1	
0466					24,2442	50067 0			
0467	REF	20	LAST	501	24,2443	0 5261 1	TC	TASKOVER	
0468					24,2444	13561 0	60SCNDS DFC	6000	

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R0471 DATA READ ROUTINE 22 (LFM)

R0472 PROGRAM DESCRIPTION

R0473 MODE NO - 2

R0474 BY P VCLANTE

R0475 FUNCTIONAL DESCRIPTION

R0476

R0477 TO PROCESS AUTOMATIC TRACK MARK DATA TO UPDATE THE STATE VECTOR OF EITHER

R0478 1M OR CSM AS DEFINED IN THE RENDEZVOUS NAVIGATION PROGRAM (P20)

R0479 CALLING SEQUENCE -

R0480 TC BANKCALL

R0481 CAEP R22LFM

R0482 SUBROUTINES CALLED -

R0483 LSR22.1

GFFLASH

WAITLIST

R0484 LSR22.2

PDTALARM

BANKCALL

R0485 LSR22.3

R411EM

R0486 NORMAL EXIT MODES-

R0487 R22 WILL CONTINUE TO RECYCLE, UPDATING STATE VECTORS WITH RADAR DATA

R0488 UNTIL P20 CEASES TO OPERATE (RENDEZVOUS FLAG SET TO ZERO) AT WHICH TIME

R0489 R22 WILL TERMINATE SELF.

R0490 ALARM OR ABORT EXIT MODES-

R0491 PRIORITY ALARM

R0492 PRIORITY ALARM 52° LOS NOT WITHIN 3 DEGREE LIMIT

R0493 OUTPUT

R0494 SEE OUTPUT FROM LSR22.3

R0495 ERASABLE INITIALIZATION REQUIRED

R0496 SEE LSR22.1, LSR22.2, LSR22.3

R0497 FLAGS SET + RESET

R0498 NCANGLOC

R0499 DEBPS

R0500 SEE LSR22.1, LSR22.2, LSR22.3

R0501 REF 2 LAST 147 E7,1737

EBANK= LRS22.1X

R0502 REF 1

COUNT# 11/P22

R0503 REF 12 LAST 504 24,2445 0 5353 1 R22LFM

TC PHASCHNG

R0504 24,2446 0 04022 0

CCT 04022

R0505 REF 6 LAST 500 24,2447 3 4745 0

CAF RNDVZBIT

IS RENDEZVOUS FLAG SET?

R0506 REF 33 LAST 505 24,2450 7 0074 0

MASK STATE

R0507 24,2451 0 0006 1

EXTEND

R0508 REF 77 LAST 505 24,2452 1 5155 1

RZF ENDCEJCB

NO-EXIT R22 AND P20

R0509 REF 10 LAST 504 24,2453 3 4747 1

CAF TRACKBIT

IS TRACKFLAG SET?

R0510 REF 34 LAST 506 24,2454 7 0075 1

MASK STATE +1

R0511 24,2455 0 0006 1

EXTEND

R0512 REF 1 24,2456 1 2647 0

RZF R22WAIT

NO WAIT

R0513 REF 48 LAST 492 24,2457 3 4735 1 R22LFM12

CAF PIT14

IS RF AUTO TRACK ENABLE DISCRETE STILL

R0514 24,2460 0 0006 1

EXTEND

ON (A MONITOR REPOSITION BY R25 CLEARST)

R0515 REF 24 LAST 470 24,2461 02 012 0

RANC CHAN12

R0516 24,2462 0 0006 1

EXTEND

R0517 REF 2 LAST 498 24,2463 1 2111 0

RZF P20LEMA

NO - RETURN TO P20

R0518 REF 27 LAST 498 24,2464 3 4752 0

CAF BIT2

YES

R0519 24,2465 0 0006 1

EXTEND

IS RF AUTO MODE DISCRETE PRESENT

R0520 REF 9 LAST 499 24,2466 02 033 0

RANC CHAN33

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0521					24,2467	0 0016 1	EXTEND		
0522					24,2470	1 2472 0	RZF	+2	YES CONTINUE
0523	REF	1			24,2471	0 2135 1	TC	P20LEMB5	NO - SET IT
0524	REF	34	LAST	499	24,2472	4 0111 0	CS	RACMODES	ARE PR CELS BEING ZERCEC
0525	REF	2	LAST	499	24,2473	7 4737 1	MASK	PCDU0BIT	
0526					24,2474	0 0016 1	EXTEND		
0527	REF	2	LAST	501	24,2475	1 2631 0	RZF	R22LEM42	CELS BEING ZERCEC
0528	REF	13	LAST	506	24,2476	0 5353 1	TC	PHASCHNG	IF A RESTART OCCURS, AN EXTRA RADAR
0529					24,2477	00152 1	CCT	00152	READING IS TAKEN, SC BAD DATA ISN'T USED
0530	REF	117	LAST	505	24,2510	0 4616 1	TC	BANKCALL	YES READ DATA + CALCULATE LCS
0531	REF	1			24,2501	64766 0	CADR	LRS22.1	DATA READ SUBROUTINE
0532	REF	237	LAST	498	24,2512	50 154 1	INDEX	MPAC	
0533					24,2503	0 2504 1	TC	+1	
0534	REF	1			24,2514	0 2525 1	TC	R22LEM2	NORMAL RETURN (GOOD DATA)
0535	REF	1			24,2505	0 2217 1	TC	P20LEMC	COULD NOT READ RADAR-TRY TC REDESIGNATE
0536	REF	1			24,2516	3 2664 1	CAF	ALRM525	RR LCS NOT WITHIN 3 DEGREES (ALARM)
0537	REF	118	LAST	507	24,2507	1 4616 1	TC	BANKCALL	
0538	REF	3	LAST	499	24,2510	21563 1	CADR	PRICLARM	
0539	REF	5	LAST	499	24,2511	0 6025 0	TC	GCTCV56	TERMINATE EXITS P20 VIA V56 CODING
0540	REF	1			24,2512	1 2515 1	TC	R22LEM1	PRCC (DISPLAY DELTA THETA)
0541					24,2513	0 2516 0	TC	-5	ENTER (ILLEGAL OPTION)
0542	REF	78	LAST	516	24,2514	0 5155 0	TC	ENDOFFCB	
0543	REF	14	LAST	507	24,2515	0 5353 1	R22LEM1	TC	PHASCHNG
0544					24,2516	04722 0	CCT	04022	
0545	REF	1			24,2517	3 2665 0	CAF	VCANCS	DISPLAY DELTA THETA
0546	REF	119	LAST	507	24,2520	0 4616 1	TC	BANKCALL	
0547	REF	1			24,2521	20510 1	CADR	PRICOSP	
0548	REF	6	LAST	507	24,2522	0 5125 0	TC	GOTOV56	TERMINATE EXITS P20 VIA V56 CODING
0549	REF	2	LAST	507	24,2523	0 2525 1	TC	R22LEM2	PRCC (CK CONTINUE)
0550	REF	2	LAST	507	24,2524	0 2217 1	TC	P20LEMC	ENTER (RECYCLE)
0551	REF	15	LAST	517	24,2525	0 5353 1	R22LEM2	TC	PHASCHNG
0552					24,2526	04722 0	CCT	04022	
0553	REF	4	LAST	499	24,2527	0 2670 1	TC	LUNSFCHK	CHECK IF ON LUNAR SURFACE (P22FLAG SET)
0554	REF	1			24,2530	0 2545 1	TC	R22LEM3	YES-BYPASS FLAG CHECKS AND LRS22.2
0555	REF	21	LAST	501	24,2531	3 0775 0	CA	FLAGWRD1	IS TRACK FLAG SET
0556	REF	11	LAST	506	24,2532	7 4747 0	MASK	TRACKBIT	
0557					24,2533	0 0016 1	EXTEND		
0558	REF	2	LAST	506	24,2534	1 2640 0	RZF	R22WAIT	NO - WAIT
0559	REF	120	LAST	507	24,2535	0 4616 1	TC	BANKCALL	YES
0560	REF	1			24,2536	51333 0	CADR	LRS22.2	CHECKS PR ECPESIGHT WITHIN 20 DEG OF +Z
0561	REF	238	LAST	507	24,2537	50 154 1	INDEX	MPAC	
0562					24,2540	0 2541 0	TC	+1	
0563	REF	2	LAST	507	24,2541	0 2545 1	TC	R22LEM3	NORMAL RETURN (LCS WITHIN 30 OF Z-AXIS)
0564	REF	121	LAST	507	24,2542	1 4616 1	TC	BANKCALL	
0565	REF	2	LAST	498	24,2543	46116 0	CAF	R61LEM	
0566	REF	3	LAST	507	24,2544	0 2640 0	TC	R22WAIT	NOT WITHIN 30 DEG OF Z-AXIS
0567	REF	22	LAST	507	24,2545	4 1175 1	R22LEM3	CS	FLAGWRD1
0568	REF	1			24,2546	7 4746 1	MASK	ACUPFBIT	SHOULD WE BYPASS STATE VECTOR UPDATE (IS ACUPDATE FLAG SET?)

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0569					24,2547	0 0006	1		EXTEND		
0570	REF	3	LAST	507	24,2550	1 2631	0		BZF	R22LEM42	BRANCH-YES
0571	REF	23	LAST	507	24,2551	3 0075	0		CA	FLAGRD1	IS UPDATE FLAG SET
0572	REF	1			24,2552	7 4745	1		MASK	UPDATEIT	
0573					24,2553	0 0006	1		EXTEND		
0574	REF	4	LAST	508	24,2554	1 2631	0		BZF	R22LEM42	UPDATE FLAG NOT SET
0575	REF	6	LAST	501	24,2555	3 7717	1		CAF	PRI026	INSURE HIGH PRIO IN RESTART
0576	REF	2	LAST	230	24,2556	55 0055	1		TS	PHSPRD12	
0577	REF	34	LAST	500	24,2557	0 6042	1		TC	INTPRET	
0578					24,2560	77650	1		GOTC		
0579	REF	1			24,2561	54416	0			LSR22.3	
0580					24,2562	77776	1	R22LEM93	EXIT		NORMAL EXIT FROM LSR22.3
0581	REF	16	LAST	507	24,2563	0 5353	1		TC	PHASCHNG	PHASE CHANGE TO PROTECT AGAINST
0582					24,2564	04022	0		OUT	04022	CONFLICT WITH GRP2FC EFASEABLE
0583	REF	1			24,2565	1 2624	1		TCF	R22LEM44	
0584					24,2566	77776	1	R22LEM96	EXIT		
0585	REF	107	LAST	498	24,2567	3 4755	1		CAF	ZERO	SET N49FLAG = ZFRC TO INDICATE
0586	REF	2	LAST	153	24,2570	55 1746	1		TS	N49FLAG	V06 N49 DISPLAY HASNT BEEN ANSWERED
0587	REF	17	LAST	518	24,2571	0 5353	1		TC	PHASCHNG	
0588					24,2572	04022	0		CCT	04022	TO PROTECT DISPLAY
0589	REF	2	LAST	193	24,2573	3 7721	0		CAF	PRI027	PROTECT DISPLAY
0590	REF	17	LAST	492	24,2574	0 5072	1		TC	NOVAC	
0591	REF	3	LAST	500	57,1746				EBANK=	N49FLAG	
0592	REF	1			24,2575	02645	1		2CADR	N49DSE	
0592	REF	1			24,2576	50067	0				
0593	REF	25	LAST	508	24,2577	0 6042	1		TC	INTPRET	
0594					24,2600	77735	0		SLCAD		
0595	REF	4	LAST	500	24,2601	03747	0			N49FLAG	
0596					24,2602	50054	0		BZF	BNN	LCCP TO CHECK IF FLAG
0597					24,2603	50600	1		-3		SETTING CHANGED-BRANCH - NO
0598	REF	1			24,2604	50612	1			R22LEM7	PROCEED
0599					24,2605	77650	1		GOTC		DISPLAY ANSWERED BY RECYCLE-INCCORPORATE
05991	REF	3	LAST	146	24,2606	03675	0		LCRET		NEXT MEASUREMENT
0600	REF	32	LAST	493	24,2607	4 4752	1	V34TCN49	CS	TWC	
0601	REF	5	LAST	508	24,2610	55 1746	1		TS	N49FLAG	
0602	REF	79	LAST	507	24,2611	0 5155	0		TC	ENDCFJCB	
0603					24,2612	77776	1	R22LEM7	EXIT		
06032	REF	6	LAST	508	24,2613	3 1746	0		CA	N49FLAG	WAS ANSWER TO DISPLAY PRC OF TERM
06034	REF	24	LAST	508	24,2614	6 4752	0		AD	TWC	
06036					24,2615	0 0006	1		EXTEND		
06038	REF	1			24,2616	1 2445	1		BZF	R22LEM4	BRANCH - TERM - TAKE ANOTHER RR READING
06039	REF	36	LAST	508	24,2617	0 6042	1		TC	INTPRET	
0604					24,2620	77624	1		CALL		
0605	REF	6	LAST	502	24,2621	11226	1		GRP2FC		PHASE CHANGE AND
0606					24,2622	77650	1		GOTC		GC TO INCCORPORATE DATA.
0607	REF	1			24,2623	55431	1		ASTOK		
0608	REF	2	LAST	498	24,2624	25 462	0	R22LEM44	INCR	MARKCTR	INCREMENT COUNT OF MARKS INCORPORATED.
0609	REF	5	LAST	507	24,2625	0 2670	1		TC	LUNSFCHK	ARE WE ON LUNAR SURFACE
0610	REF	1			24,2626	0 2642	0		TC	R22LEM46	YES - WAIT 2 SECONDS

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0611	REF	10	LAST	428	24,2627	3 4756 1	CA	FIVE	NOT ON LUNAR SURFACE
0612	REF	1			24,2630	0 2634 1	TC	P22LFM45	R65COUNTER = 5
0613	REF	6	LAST	508	24,2631	0 2670 1	R22LEM42	TC	LUNSFCHK
0614	REF	2	LAST	508	24,2632	0 2642 0	TC	R22LEM46	CHECK IF ON LUNAR SURFACE (P22FLAG SET)
0615	REF	35	LAST	508	24,2633	3 4752 0	CA	TWO	YES - WAIT 2 SECONDS
0616	REF	2	LAST	505	24,2634	55 745 1	R22LEM45	TS	NO-SET R65COUNTER = 2
0617	REF	122	LAST	507	24,2635	0 4616 1	TC	BANKCALL	
0618	REF	2	LAST	505	24,2636	46123 0	CADR	R65LEM	FINE PREFERRED TRACKING ATTITUDE
0619	REF	2	LAST	508	24,2637	0 2445 0	TC	R22LFM	
0620	REF	2	LAST	501	24,2640	3 2667 1	R22WAIT	CAF	1500EFC
0621	REF	2	LAST	500	24,2641	0 2233 1	TC	P20LFMWT +1	

0622	REF	123	LAST	509	24,2642	0 4616 1	R22LEM46	TC	BANKCALL	
06226	REF	3	LAST	509	24,2643	0 1735 1	CADR	2SECCLY	WAIT 2 SECONDS AND TAKE ANOTHER MARK	
0623	REF	3	LAST	509	24,2644	0 2445 0	TC	R22LFM		

0624	REF	1			24,2645	3 2666 0	N49DSP	CAF	V06N49NB	
0625	REF	124	LAST	509	24,2646	0 4616 1	TC	BANKCALL	EXCESSIVE STATE VECTOR UPDATE - FLASH	
0626	REF	2	LAST	507	24,2647	2 510 1	CADR	PR10DSP	VERB 06 NCUA 49 R1=DELTA R, R2=DELTA V	
0627	REF	1			24,2650	0 2607 1	TC	V34TCN49	TERMINATE - SET N49FLAG = -2	
0628	REF	63	LAST	495	24,2651	4 4753 0	CS	ONE	PROCEED - N49FLAG = -1	
0629	REF	7	LAST	508	24,2652	55 746 1	TS	N49FLAG	PRECYCLE - N49FLAG = + VALUE	
0630	REF	80	LAST	508	24,2653	0 5155 0	TC	FADCEJOR		
0631	REF	18	LAST	508	24,2654	0 5253 1	R22RSTRT	TC	PHASCHNG	IF A RESTART OCCURS WHILE READING RADAR
0632					24,2655	00152 1	OCT	00152	COME HERE TO TAKE A RANGE-RATE READING	
0633	REF	125	LAST	509	24,2656	0 4616 1	TC	BANKCALL	WHICH ISNT USED TO PREVENT TAKING A BAD	
0634	REF	2	LAST	493	24,2657	53112 0	CADR	RPRDCT	READING AND TRYING TO INCORPORATE THE	
0635	REF	126	LAST	509	24,2660	0 4616 1	TC	BANKCALL	RAD DATA	
0636	REF	5	LAST	492	24,2661	17706 0	CADR	PADSTALL	WAIT FOR READ COMPLETE	
0637	REF	3	LAST	507	24,2662	0 2217 1	TC	P20LEMC	COULD NOT READ RADAR-TRY TO REDESIGNATE	
0638	REF	4	LAST	509	24,2663	0 2445 0	TC	R22LFM	READ SUCCESSFUL-CONTINUE AT P22	

0639					24,2664	00525 0	ALRM525	OCT	00525	
0640					24,2665	01405 1	V06N05	VM	00605	
0641					24,2666	01461 0	V06N49NB	VM	00649	
0642					24,2667	02734 0	1500DEC	DFC	1500	
R0644	LUNSFCHK-CLOSED SUPRCUTLINE TO CHECK IF ON LUNAR SURFACE (P22FLAG)									
R0645	RETURNS TO CALLER +1 IF P22FLAG SET									
R0646	TO CALLER +2 IF P22FLAG NOT SET									

0647	REF	2	LAST	503 TO	504:	0	C*	CCLNT*	\$4/P22	
0648	REF	5	LAST	337	24,2670	4 0104 0	LUNSFCHK	CS	FLAGWRD8	CHECK IF ON LUNAR SURFACE
0649	REF	4	LAST	337	24,2671	7 4744 0	MASK	SURFFBIT	IS SURFFLAG SET?	
0650	REF	166	LAST	501	24,2672	10 000 0	CCS	A	BRANCH - P22FLAG SET	
0651	REF	150	LAST	478	24,2673	24 002 0	INCR	Q	NOT SET	
0652	REF	151	LAST	509	24,2674	0 0232 0	TC	Q	RETURN	

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R0652 RR DESIGNATE ROUTINE (R21LEM)

R0654 PROGRAM DESCRIPTION

R0655 MCE NC - 2

R0656 BY P. CLANTE

R0657 FUNCTIONAL DESCRIPTION

R0658

R0659 TO POINT THE PENETRATOR RADAR AT THE CSM UNTIL AUTOMATIC ACQUISITION

R0660 OF THE CSM IS ACCOMPLISHED BY THE RADAR. ROUTINE IS CALLED BY P20.

R0661 CALLING SEQUENCE -

R0662 TO BANKCALL

R0663 CACP R21LEM

R0664 SLBROUTINES CALLED -

R0665 FINEVAC FIAGUP FADCFJOB EPICLARM

R0666 NOVAC INTERST LPS20.1 PHASCHNG

R0667 WAITLIST JCRSLIF JCEWAKE FLAGECWN

R0668 TASKOVER BANKCALL RAPSTALL RRDSSM

R0669 NORMAL EXIT MODES

R0670 WHEN LOCK-ON IS ACHIEVED, BRANCH WILL BE TO P20 WHERE R22 (DATA READ

R0671 WILL BE SELECTED OR A NEED FOR A MANEUVER (BRANCH TO P21LEMA)

R0672 ALARM OR ABORT EXIT MODES -

R0673 PRIORITY ALARM 503 WHEN LOCK-ON HASN'T BEEN ACHIEVED AFTER 30 SECS -

R0674 THIS REQUIRES ASTRONAUT INTERFACE- SELECTION OF SEARCH OPTION OF

R0675 ACQUISITION

R0676 OUTPUT

R0677 SEE LPS20.1, RRDSSM

R0678 FRASABLE INITIALIZATION REQUIRED

R0679 PRTARGET, RADMODES ARE USED BY LPS20.1 AND RRDSSM

R0680 FLAGS SET + RESET

R0681 LOSCMELE LOCKNSW

R0682 DEPRIS

R0683 SEE LPS20.1, RRDSSM

R0684 REF 13 LAST 505 F7, 1456 EBANK= LOSCCLNT

R0685 REF 1 COUNT# \$4/P21

R0686 REF 49 LAST 506 24,2675 4 4736 0 R21LEM CS PIT14 REMOVE RR SELF TRACK ENABLE

R0687 24,2676 0 0006 1 EXTEND

R0688 REF 25 LAST 506 24,2677 03 012 1 WAND CHAN12

R0689 REF 7 LAST 505 24,2700 0 2670 1 TC LUNSECHK

R0690 REF 1 24,2711 0 2706 1 TC P21LEM5

R0691 REF 108 LAST 508 24,2702 3 4755 1 CAF ZEPC COMMAND ANTENNA TO MODE CENTER

R0692 REF 4 LAST 317 24,2703 55'106 0 TS TANG IF ACT ON SURFACE-MODE 1- (T=0, S=0)

R0693 REF 5 LAST 510 24,2704 55'107 1 TS TANG +1

R0694 REF 1 24,2705 0 2716 0 TC R21LEM6

R0695 REF 21 LAST 455 24,2706 3 4740 0 R21LEM5 CAF BIT12

R0696 REF 35 LAST 507 24,2707 7 0110 0 MASK RALMODES

R0697 REF 167 LAST 505 24,2710 10 000 0 CCS A

R0698 REF 1 24,2711 0 2726 0 TC R21LEM10

R0699 REF 29 LAST 472 24,2712 3 4735 1 CAF BIT15

R0700 REF 6 LAST 510 24,2713 55'106 0 TS TANG

R0701 REF 4 LAST 374 24,2714 4 4736 0 CS HALF

R0702 REF 7 LAST 510 24,2715 55'107 1 TS TANG +1

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0703	REF	45	LAST	504	24,2716	0 5516 0	R21LEM6	TC	DCWFLAG	
0704	REF	2	LAST	271	24,2717	00012 1		ADRES	LCKCNSW	
0705	REF	127	LAST	505	24,2720	0 4616 1		TC	BANKCALL	
0706	REF	2	LAST	269	24,2721	52516 0		CADR	PPCESNB	
0707					24,2722	0 2723 0		TC	+1	
0708	REF	128	LAST	511	24,2723	0 4616 1		TC	BANKCALL	
0709	REF	6	LAST	509	24,2724	17706 0		CADR	RACSTALL	
0710	REF	1			24,2725	0 2761 0		TC	P21-503	BAD RETURN FROM DESIGNATE - ISSUE ALARM
0711	REF	24	LAST	504	24,2726	0 5524 0	R21LEM10	TC	UPFLAG	
0712	REF	2	LAST	498	24,2727	00041 1		ADRES	LCSCMFLG	EVERY FOURTH PASS THRU CODES
0713	REF	1			24,2728	3 2310 1		CAF	MAXTRIES	ALLOW 60 PASSES (APPROX 45 SECONDS)
0714	REF	1			24,2731	551113 1		TS	DESCCOUNT	TO DESIGNATE AND LOCK ON
0715	REF	17	LAST	476	24,2732	3 6250 0	R21LEM2	CAF	THREE	
0716	REF	14	LAST	510	24,2733	551456 0		TS	LCSCCLNT	
0717	REF	37	LAST	508	24,2734	0 6142 1	R21LEM1	TC	INTPSET	
0718					24,2735	42234 0		RTB	DAF	
0719	REF	8	LAST	500	24,2736	21574 1			LCADTIME	
0720	REF	1			24,2737	11121 0			HALFSEC	EXTRAPOLATE TO PRESENT TIME + .5 SEC.
0721	REF	12	LAST	502	24,2740	34071 0		STCALL	TDEC1	LCS DETERMINATION ROUTINE
0722	REF	2	LAST	498	24,2741	51255 1			LPS20.1	
0723					24,2742	77775 1		EXIT		
0724	REF	25	LAST	511	24,2743	0 5564 0	R21LEM3	TC	UPFLAG	SET LCKCNSW TO RADAR-ON DESIRED
0725	REF	4	LAST	511	24,2744	00012 1		ADRES	LCKCNSW	
0726	REF	46	LAST	511	24,2745	0 5516 0		TC	DCWFLAG	
0727	REF	4	LAST	498	24,2746	00126 1		ADRES	NORRMCON	
0728	REF	38	LAST	511	24,2747	0 6142 1		TC	INTPSET	
0729					24,2750	77624 1		CALL		INPUT (INTPSET UPDATED BY LPS20.1)
0730	REF	1			24,2751	52414 0		RRDESSM		DESIGNATE ROUTINE
0731					24,2752	77776 1		EXIT		
0732	REF	1			24,2753	0 3002 0		TC	P21LEM4	LCS ACT IN MODE 2 COVERAGE
A0733										ON LUNAR SURFACE
0734	REF	3	LAST	506	24,2754	0 2111 1		TC	P21LEM5	VEHICLE MANEUVER REQUIRED.
0735	REF	129	LAST	511	24,2755	0 4616 1		TC	BANKCALL	NO VEHICLE MANEUVER REQUIRED
0736	REF	7	LAST	511	24,2756	17716 0		CADR	RACSTALL	WAIT FOR DESIGNATE COMPLETE - LOCKON OR
0737					24,2757	0 2761 0		TC	+2	PACENE-LOCKON NOT ACHIEVED IN 60 TRIES
0738	REF	1			24,2760	0 2771 0		TC	R21END	EXIT ROUTINE RETURN TO P20 (LOCKON)
0739	REF	1			24,2761	3 3100 1	R21-503	CAF	ALRM503	ISSUE ALARM 503
0740	REF	130	LAST	511	24,2762	0 4616 1		TC	BANKCALL	
0741	REF	4	LAST	507	24,2763	21563 1		CADR	PRICLARM	
0742	REF	7	LAST	507	24,2764	0 6125 0		TC	GCTCV56	TERMINATE EXITS P20 VIA V56 CODING
0743	REF	1			24,2765	0 2775 0		TC	R21SRCH	PPCC
0744	REF	2	LAST	501	24,2766	0 2211 1		TC	P21LEMC3	
0745	REF	91	LAST	509	24,2767	0 5155 0		TC	ENDOFJOB	
0746	REF	47	LAST	511	24,2770	0 5516 0	R21ENC	TC	DCWFLAG	
0747	REF	2	LAST	511	24,2771	00041 1		ADRES	LCSCMFLG	RESET LCSCMFLG
07473	REF	8	LAST	510	24,2772	0 2670 1		TC	LUNSPCHK	ARE WE ON LUNAR SURFACE
07476	REF	4	LAST	505	24,2773	0 2232 0		TC	P20LEMW1	YES - BYPASS V 50 N 72 DISPLAY
0748	REF	1			24,2774	0 3122 0		TC	R21DTSP	PUT UP VERIFY MAIN LOBE LOCKON DISPLAY
0749	REF	19	LAST	509	24,2775	0 5353 1	R21SRCH	TC	PRASCENG	
0750					24,2776	04122 0		CCT	04122	

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0751	REF	1			24,2777	0 3217	1	TC	R24LEM	SEARCH ROUTINE
0752					24,3010	00503	1	ALRM503	CCT	00503
0753					24,3011	00527	1	ALRM527	CCT	527
0754	REF	2	LAST	511	24,3002	3 2310	1	R21LEM4	CAF	MAXTRIES
0755	REF	2	LAST	140	24,3002	551423	1	TS	REPOSCNT	SET UP COUNTER FOR
0756	REF	26	LAST	511	24,3004	0 5504	0	TC	UPFLAG	60 PASSES (APPROX 600 SECS.)
0757	REF	1			24,3005	00005	1	ADRES	FSPASFLG	SET FIRST PASS FLAG
0758	REF	48	LAST	511	24,3006	0 5516	0	TC	DOWNFLAG	RESET LCS BEING
0759	REF	4	LAST	511	24,3007	0 0141	1	ADRES	LCSCMFLG	COMPUTED FLAG
0760	REF	29	LAST	511	24,3017	0 6242	1	TC	INTPRET	
0761					24,3011	43234	0	R21LEM12	RTB	DAD
0762	REF	9	LAST	511	24,3012	21574	1		LCAC TIME	
0763	REF	1			24,3013	11117	0		TEASEC	TIME T = T + 11 SECS.
0764	REF	2	LAST	140	24,3014	03425	1	STORE	REPOSTM	SAVE FOR LONGCALL AND UPPSV
0765	REF	13	LAST	511	24,3015	34041	0	STCALL	TDEC1	
0766	REF	3	LAST	511	24,3016	51255	1		LPS20.1	COMPUTE LCS AT TIME T
0767					24,3017	77624	1	CALL		
0768	REF	2	LAST	511	24,3020	52404	0		PROLSSM	
0769					24,3021	77776	1	EXIT		
0770	REF	1			24,3022	0 3034	0	TC	R21LEM13	LCS NOT IN MODE 2 COVERAGE
0771	REF	82	LAST	511	24,3022	0 5155	0	TC	ENDOFJOB	VEHICLE MANEUVER REQUIRED
07721	REF	1			24,3024	0 6132	0	TC	KILLTASK	
07722	REF	1			24,3025	52604	1	CAER	BEODES	
07724	REF	41	LAST	512	24,3026	0 6142	1	TC	INTPRET	
0773					24,3027	43114	0	BOF	CLPGC	
0774	REF	2	LAST	512	24,3030	00345	0		FSPASFLG	FIRST PASS THRU REPOSITION
0775	REF	1			24,3031	51044	0		R21LEM8	NO-GO TO CONTINUOUS DESIGNATE
0777	REF	2	LAST	512	24,3032	00225	1		FSPASFLG	YES-RESET FIRST PASS FLAG
0778	REF	1			24,3033	51041	0		R21LEM50	
0779	REF	3	LAST	512	24,3034	111423	1	R21LEM13	CCS	REPOSCNT
0780	REF	1			24,3035	0 3037	0	TC	R21LEM7	HAVE WE TRIED 60 TIMES?
0781	REF	1			24,3036	0 3106	0	TC	R21LEM11	NO-ADD 10 SECS. RECOMPLETE LCS
0782	REF	4	LAST	512	24,3037	551423	1	R21LEM7	TS	REPOSCNT
07821	REF	41	LAST	512	24,3040	0 6242	1	TC	INTPRET	YES-PUT OUT ALARM 530
07822					24,3041	52145	0	R21LEM50	ELCAD	GOTO
07823	REF	3	LAST	512	24,3042	03425	1		REPOSTM	
07824	REF	1			24,3043	51013	1		R21LEM12 +2	
0784					24,3044	77745	1	R21LEM8	ELCAD	
0785	REF	4	LAST	512	24,3045	03425	1		REPOSTM	
0786	REF	14	LAST	512	24,3046	34041	0	STCALL	TDEC1	
0787	REF	2	LAST	500	24,3047	50312	1		UPPSV	
0788					24,3050	77776	1	EXIT		
0789	REF	27	LAST	512	24,3051	0 5504	0	TC	UPFLAG	SET RADMCDES BIT 15 FOR
0790	REF	2	LAST	271	24,3052	00264	1	ADRES	CCFSFLAG	CONTINUOUS DESIGNATION
0791	REF	49	LAST	512	24,3053	0 5516	0	TC	DOWNFLAG	
0792	REF	5	LAST	511	24,3054	0 0112	1	ADRES	LOCKNSW	
0793	REF	28	LAST	512	24,3055	0 5504	0	TC	UPFLAG	
0794	REF	5	LAST	511	24,3056	00126	1	ADRES	NCRPMCA	

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0795	REF	131	LAST	511	24,3057	0 4616 1	TC	BANKCALL	
0796	REF	3	LAST	511	24,3061	52506 0	CADR	PPDESAB	
0797					24,3061	0 3062 0	TC	+1	
07971	REF	42	LAST	512	24,3062	0 6042 1	TC	INTERPT	
0798					24,3063	44234 1	RTB	BDSU	
0799	REF	10	LAST	512	24,3064	21574 1		LCACTIME	COMPUTE DELTA TIME
0800	REF	5	LAST	512	24,3065	03425 1		REPOSTM	FOR LONGCALL
0801	REF	1			24,3066	03427 0	STORE	DELTATM	
0802					24,3067	77776 1	EXIT		
08021					24,3070	0 0006 1	EXTEND		
0803	REF	2	LAST	513	24,3071	3 1427 1	DCA	DELTATM	
0804	REF	2	LAST	375	24,3072	0 5277 0	TC	LONGCALL	
0805	REF	15	LAST	511	27,1456		FBANK=	LCSCCUNT	
0806	REF	1			24,3073	03076 0	2CADR	R21LEM9	
0806	REF	1			24,3074	50167 0			
0807	REF	83	LAST	512	24,3075	0 5155 0	TC	ENDOFJOB	
0808	REF	2	LAST	512	24,3076	0 6032 0	TC	KILLTASK	
0809	REF	1			24,3077	52613 1	CADR	STDESIG	
0810	REF	6	LAST	498	24,3100	0 6011 1	TC	CLRADMOD	
0811	REF	7	LAST	508	24,3101	3 7717 1	CAF	PRIC26	
0812	REF	20	LAST	505	24,3102	0 5105 1	TC	FINDVAC	
0813	REF	16	LAST	513	27,1456		FBANK=	LCSCCUNT	
0814	REF	2	LAST	510	24,3103	02726 0	2CADR	R21LEM10	
0814					24,3104	50167 0			
0815	REF	21	LAST	505	24,3105	3 5261 1	TC	TASKOVER	
0816	REF	1			24,3106	3 3115 1	CAF	ALRM530	ALARM 530-LCS NOT IN COVERAGE
0817	REF	132	LAST	513	24,3107	0 4616 1	TC	BANKCALL	AFTER TRYING TO DESIGNATE FOR
0818	REF	5	LAST	511	24,3110	21563 1	CADR	PRICLARM	600 SECS.
0819	REF	8	LAST	511	24,3111	0 6025 0	TC	GCTCV56	
0820	REF	9	LAST	513	24,3112	0 6025 0	TC	GCTCV56	
0821	REF	10	LAST	513	24,3113	0 6025 0	TC	GCTCV56	
0822	REF	84	LAST	513	24,3114	0 5155 0	TC	ENDOFJOB	
0824					24,3115	00530 1	ALRM530	CCT	00530
0825					24,3116	00000 1	TENSEC	2DEC	1000 R-28
0825					24,3117	01750 1			
0826					24,3120	00000 1	HALFSEC	2DEC	50
0826					24,3121	00062 0			
0827	REF	20	LAST	511	24,3122	0 5353 1	R21DISF	TC	PHASCENG
0828					24,3123	04022 0	CCT	04022	
0829	REF	1			24,3124	3 3135 0	CAF	V06N72PV	FLASH V 50 N 72 - PLEASE PERFORM RR
0830	REF	123	LAST	513	24,3125	0 4616 1	TC	BANKCALL	MAIN LCEP LOCKEN VERIFICATION
0831	REF	2	LAST	476	24,3126	20711 1	CADR	GCPERE2R	
0832	REF	11	LAST	513	24,3127	0 6025 0	TC	GCTCV56	TERMINATE EXITS VIA V 56
0833	REF	5	LAST	511	24,3130	0 2232 0	TC	P20LEMWT	PROCEED CONTINUES TO R22
0834					24,3131	0 3124 0	TC	-5	ENTER ILLEGAL
0835	REF	22	LAST	477	24,3132	3 4745 0	CAF	BIT7	
0836	REF	2	LAST	477	24,3133	0 5464 1	TC	LINALS	SET BITS TO MAKE THIS A PRIORITY DISPLAY
0837	REF	85	LAST	513	24,3134	0 5155 0	TC	ENDOFJOB	

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083R

24,3135 C1510 1 V6EN72PV VN 00672

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P0839 MANUAL ACQUISITION ROUTINE P23LEM

P0840 PROGRAM DESCRIPTION

P0841 MOD NO - 2

P0842 BY P VCLANTE

P0843 FUNCTIONAL DESCRIPTION

P0844

P0845 TO ACQUIRE THE CSM BY MANUAL OPERATION OF THE RENDEZVOUS RADAR

P0846 CALLING SEQUENCE -

P0847 TC R23LEM

P0848 SUBROUTINES CALLED

P0849 BANKCALL R61LEM

P0850 SETMINDB G00PERF1

P0851 NORMAL EXIT MODES -

P0852 IN RESPONSE TO THE G00PERF1 ,SELECTION OF ENTER WILL RECYCLE P23

P0853 ,SELECTION OF PRCC WILL CONTINUE R23

P0854 ,SELECTION OF TERM WILL TERMINATE R23 +P20

P0855 ALARM OR ABORT EXIT MODES -

P0856 SEE NORMAL EXIT MODES ABOVE

P0857 OUTPUT

P0858 N.A.

P0859 ERASABLE INITIALIZATION REQUIRED-

P0860 ACMODELG MUST BE SET TO 1 (MANUAL MODE)

P0861 REF 1

1142

EBANK= GENRET

P0862 REF 1

CCUNT* 11/P23

P0863 REF 29 LAST 512 24,3136 0 5504 0 R23LEM

TC UPFLAG

SET NO ANGLE MONITOR FLAG

P0864 REF 6 LAST 512 24,3137 0 0126 1

ADRES ACRRMCA

P0865 REF 1 LAST 512 24,3140 0 0004 0

INHINT

P0866 REF 17 LAST 335 24,3141 0 4674 0

TC IBNKCALL

SELECT MINIMUM DEADBAND

P0867 REF 1 LAST 512 24,3142 0 0141 1

CADR SETMINDB

P0868 REF 1 LAST 512 24,3143 0 0003 1

RELINT

P0869 REF 50 LAST 512 24,3144 3 4736 1 R23LEM1

CAF BIT14

ENABLE TRACKER

P0870 REF 1 LAST 512 24,3145 0 0006 1

EXTEND

P0871 REF 26 LAST 512 24,3146 05 012 1

WOR CHAN12

P0872 REF 1 LAST 512 24,3147 2 3206 0

CAF OCT205

P0873 REF 134 LAST 513 24,3150 0 4616 1

TC BANKCALL

P0874 REF 2 LAST 499 24,3151 2 0624 0

CADR G00PERF1

P0875 REF 1 LAST 512 24,3152 0 3177 0

TC R23LEM2

TERMINATE

P0876 REF 1 LAST 512 24,3153 0 3155 0

TC R23LEM11

PROCEED

P0877 REF 1 LAST 512 24,3154 0 3202 1

TC R23LEM3

ENTER- DC ANOTHER MANUEVER

P0878 REF 1 LAST 512 24,3155 0 0004 0 R23LEM11

INHINT

P0879 REF 2 LAST 188 24,3156 0 4523 1

TC PRIMCHK

YES - CHECK IF ANTENNA IS WITHIN LIMITS

P0880 REF 4 LAST 317 24,3157 0 0035 1

ADRES CCUT

P0881 REF 1 LAST 512 24,3160 0 2167 1

TC OUTCLIM

ACT WITHIN LIMITS

P0882 REF 18 LAST 515 24,3161 0 4674 0

TC IBNKCALL

RESTORE CFADRBAND TO

P0883 REF 4 LAST 296 24,3162 0 0115 0

CADR RESTCRDB

ASTRONAUT SELECTED VALLE

P0884 REF 1 LAST 512 24,3163 0 0003 1

RELINT

P0885 REF 50 LAST 512 24,3164 0 5516 0

TC DOWNFLAG

CLEAR NO ANGLE MONITOR FLAG

P0886 REF 7 LAST 515 24,3165 0 0126 1

ADRES ACRRMCA

P0887 REF 1 LAST 512 24,3166 0 2163 1

TC P20LEMB1

RADAR IS LOCKED ON CONTINUE IN P20

P0888 REF 1 LAST 512 24,3167 0 0003 1

OUTOFLIM RELINT

L R20-P25

USFF'S PAGE NO. 23 E2 S3

0889	REF	1		24,3170	0 3205 J	CAF	OCT501PV	
0890	REF	125	LAST	515	24,3171	0 4616 1	TC	BANKCALL
0891	REF	6	LAST	513	24,3172	21563 1	CADR	PRICLARM
0892	REF	2	LAST	515	24,3173	0 3177 0	TC	R23LEM2
0893	REF	2	LAST	515	24,3174	0 3170 1	TC	CUTCFLIM +1
0894	REF	2	LAST	515	24,3175	0 3202 1	TC	R23LEM3
0895	REF	86	LAST	513	24,3176	0 5155 0	TC	FNOCFJOB
0896	REF	51	LAST	515	24,3177	0 5516 0	R23LEM2	TC
0897	REF	8	LAST	515	24,3200	00126 1	ADRES	NCRMON
0898	REF	12	LAST	513	24,3201	0 6025 0	TC	GCTCV56
0899	REF	136	LAST	516	24,3202	0 4616 1	R23LEM3	TC
0900	REF	3	LAST	507	24,3203	46116 J	CADR	BEILEM
0901	REF	1			24,3204	0 3144 0	TC	R23LEM1
0902					24,3205	00501 0	OCT501PV	CCT
0903					24,3206	00205 0	OCT205	CCT

ISSUE ALARM - RR ANTENNA NOT WITHIN LIMITS

TERMINATE - EXIT R23 TO RCC (GC TO FCF)
PROCEED ILLEGAL
RECYCLE- DO ANOTHER MANUEVER

CLEAR NO ANGLE MONITOR FLAG

AND EXIT VIA V56

L R20-P25

LSFR'S PAGE NO. 24 E2 S3

R0904 SEARCH ROUTINE P24LEM
R0905 PROGRAM DESCRIPTION
R0906 MOD NO - 2

R0907 BY P. VOLANTE
R0908 FUNCTIONAL DESCRIPTION
R0909

R0910 TO ACQUIRE THE CSM BY A SEARCH PATTERN WHEN THE REACQZVCLS RADAR HAS
R0911 FAILED TO ACQUIRE THE CSM IN THE AUTOMATIC TRACKING MODE AND TO ALLOW
R0912 THE ASTRONAUT TO CONFIRM THAT REACQUISITION HAS NOT BEEN BY Sidelobe.

R0913 CALLING SEQUENCE

R0914 CAF PRICM
R0915 TC FINDVAC

R0916 BANK= DATACOD
R0917 ZCADR P24LEM

R0918 SUBROUTINES CALLED

R0919 FLAGUR, FLAGDOWN, BANKCALL

R0920 R61LEM, GCFLASHR, FINDVAC

R0921 ENDCFJCP, MCVAC, LSR24.1

R0922 NORMAL EXIT MODES-

R0923 ASTRONAUT RESPONSE TO DISPLAY OF CMGA AND DATACOD. HE CAN EITHER

R0924 REJECT BY TERMINATING (SEARCH OPTION AND RESELECTING P20) OR ACCEPT BY

R0925 PROCEEDING (EXIT ROUTINE AND RETURN TO AUTO MODE IN P20)

R0926 ALARM OR ABORT EXIT MODES-

R0927 SEE NORMAL EXIT MODES ABOVE

R0928 OUTPLT -

R0929 SEE OUTPUT FROM LSR24.1 + R61LEM

R0930 FRASABLE INITIALIZATION EQUIPPED

R0931 SEE INPLT FOR LSR24.1

R0932 FLAGS SET + RESET

R0933 SRCHCPT, ACMCFLE

R0934 RFF 2 LAST 317 24,3207 0 5514 0 P24LEM FRANK= DATACOD

R0935 RFF 1 COUNT* 55/P24

R0936 RFF 31 LAST 515 24,3207 0 5514 0 P24LEM TC UREFLAG

R0937 RFF 4 LAST 499 24,3210 0 5516 0 ADRES SRCHCPTA

R0938 RFF 52 LAST 516 24,3211 0 5516 0 TC DOWNFLAG

R0939 RFF 5 LAST 512 24,3212 0 5516 1 ADRES LSCMFLE

R0940 RFF 109 LAST 510 24,3213 0 5516 1 R24LEM1 SET SRCHCPT FLAG

R0941 RFF 4 LAST 517 24,3214 0 5516 0 TS DATACOD

R0942 RFF 2 LAST 317 24,3215 0 5516 1 TS CMGAD

R0943 RFF 3 LAST 517 24,3216 0 5516 0 TS CMGAD +1

R0944 RFF 21 LAST 513 24,3217 0 5353 1 R24LEM2 ZERC CMGA DISPLAY REGS

R0945 24,3220 0 5353 1 TC RASCING

R0946 RFF 1 24,3221 0 5353 1 CCT 04022

R0947 RFF 127 LAST 516 24,3222 0 5353 1 CAF V16N80

R0948 RFF 1 24,3223 0 5353 0 TC BANKCALL

R0949 RFF 13 LAST 516 24,3224 0 5353 0 CADR PRICDPR

R0950 RFF 1 24,3225 0 5353 1 TC GCTOV56

R0951 RFF 1 24,3226 0 5353 1 TC R24END

R0952 RFF 1 24,3227 0 5353 1 TC R24END

R0953 RFF 1 24,3228 0 5353 1 TC R24END

R0954 RFF 1 24,3229 0 5353 1 TC R24END

R0955 RFF 1 24,3230 0 5353 1 TC R24END

R0956 RFF 1 24,3231 0 5353 1 TC R24END

R0957 RFF 1 24,3232 0 5353 1 TC R24END

R0958 RFF 1 24,3233 0 5353 1 TC R24END

R0959 RFF 1 24,3234 0 5353 1 TC R24END

R0960 RFF 1 24,3235 0 5353 1 TC R24END

R0961 RFF 1 24,3236 0 5353 1 TC R24END

R0962 RFF 1 24,3237 0 5353 1 TC R24END

R0963 RFF 1 24,3238 0 5353 1 TC R24END

R0964 RFF 1 24,3239 0 5353 1 TC R24END

R0965 RFF 1 24,3240 0 5353 1 TC R24END

R0966 RFF 1 24,3241 0 5353 1 TC R24END

R0967 RFF 1 24,3242 0 5353 1 TC R24END

R0968 RFF 1 24,3243 0 5353 1 TC R24END

R0969 RFF 1 24,3244 0 5353 1 TC R24END

R0970 RFF 1 24,3245 0 5353 1 TC R24END

R0971 RFF 1 24,3246 0 5353 1 TC R24END

R0972 RFF 1 24,3247 0 5353 1 TC R24END

R0973 RFF 1 24,3248 0 5353 1 TC R24END

R0974 RFF 1 24,3249 0 5353 1 TC R24END

R0975 RFF 1 24,3250 0 5353 1 TC R24END

R0976 RFF 1 24,3251 0 5353 1 TC R24END

R0977 RFF 1 24,3252 0 5353 1 TC R24END

R0978 RFF 1 24,3253 0 5353 1 TC R24END

R0979 RFF 1 24,3254 0 5353 1 TC R24END

R0980 RFF 1 24,3255 0 5353 1 TC R24END

R0981 RFF 1 24,3256 0 5353 1 TC R24END

R0982 RFF 1 24,3257 0 5353 1 TC R24END

R0983 RFF 1 24,3258 0 5353 1 TC R24END

R0984 RFF 1 24,3259 0 5353 1 TC R24END

R0985 RFF 1 24,3260 0 5353 1 TC R24END

R0986 RFF 1 24,3261 0 5353 1 TC R24END

R0987 RFF 1 24,3262 0 5353 1 TC R24END

R0988 RFF 1 24,3263 0 5353 1 TC R24END

R0989 RFF 1 24,3264 0 5353 1 TC R24END

R0990 RFF 1 24,3265 0 5353 1 TC R24END

R0991 RFF 1 24,3266 0 5353 1 TC R24END

R0992 RFF 1 24,3267 0 5353 1 TC R24END

R0993 RFF 1 24,3268 0 5353 1 TC R24END

R0994 RFF 1 24,3269 0 5353 1 TC R24END

R0995 RFF 1 24,3270 0 5353 1 TC R24END

R0996 RFF 1 24,3271 0 5353 1 TC R24END

R0997 RFF 1 24,3272 0 5353 1 TC R24END

R0998 RFF 1 24,3273 0 5353 1 TC R24END

R0999 RFF 1 24,3274 0 5353 1 TC R24END

R1000 RFF 1 24,3275 0 5353 1 TC R24END

R1001 RFF 1 24,3276 0 5353 1 TC R24END

R1002 RFF 1 24,3277 0 5353 1 TC R24END

R1003 RFF 1 24,3278 0 5353 1 TC R24END

R1004 RFF 1 24,3279 0 5353 1 TC R24END

R1005 RFF 1 24,3280 0 5353 1 TC R24END

R1006 RFF 1 24,3281 0 5353 1 TC R24END

R1007 RFF 1 24,3282 0 5353 1 TC R24END

R1008 RFF 1 24,3283 0 5353 1 TC R24END

R1009 RFF 1 24,3284 0 5353 1 TC R24END

R1010 RFF 1 24,3285 0 5353 1 TC R24END

R1011 RFF 1 24,3286 0 5353 1 TC R24END

R1012 RFF 1 24,3287 0 5353 1 TC R24END

R1013 RFF 1 24,3288 0 5353 1 TC R24END

R1014 RFF 1 24,3289 0 5353 1 TC R24END

R1015 RFF 1 24,3290 0 5353 1 TC R24END

R1016 RFF 1 24,3291 0 5353 1 TC R24END

R1017 RFF 1 24,3292 0 5353 1 TC R24END

R1018 RFF 1 24,3293 0 5353 1 TC R24END

R1019 RFF 1 24,3294 0 5353 1 TC R24END

R1020 RFF 1 24,3295 0 5353 1 TC R24END

R1021 RFF 1 24,3296 0 5353 1 TC R24END

R1022 RFF 1 24,3297 0 5353 1 TC R24END

R1023 RFF 1 24,3298 0 5353 1 TC R24END

R1024 RFF 1 24,3299 0 5353 1 TC R24END

R1025 RFF 1 24,3300 0 5353 1 TC R24END

R1026 RFF 1 24,3301 0 5353 1 TC R24END

R1027 RFF 1 24,3302 0 5353 1 TC R24END

R1028 RFF 1 24,3303 0 5353 1 TC R24END

R1029 RFF 1 24,3304 0 5353 1 TC R24END

R1030 RFF 1 24,3305 0 5353 1 TC R24END

R1031 RFF 1 24,3306 0 5353 1 TC R24END

R1032 RFF 1 24,3307 0 5353 1 TC R24END

R1033 RFF 1 24,3308 0 5353 1 TC R24END

R1034 RFF 1 24,3309 0 5353 1 TC R24END

R1035 RFF 1 24,3310 0 5353 1 TC R24END

R1036 RFF 1 24,3311 0 5353 1 TC R24END

R1037 RFF 1 24,3312 0 5353 1 TC R24END

R1038 RFF 1 24,3313 0 5353 1 TC R24END

R1039 RFF 1 24,3314 0 5353 1 TC R24END

R1040 RFF 1 24,3315 0 5353 1 TC R24END

R1041 RFF 1 24,3316 0 5353 1 TC R24END

R1042 RFF 1 24,3317 0 5353 1 TC R24END

R1043 RFF 1 24,3318 0 5353 1 TC R24END

R1044 RFF 1 24,3319 0 5353 1 TC R24END

R1045 RFF 1 24,3320 0 5353 1 TC R24END

R1046 RFF 1 24,3321 0 5353 1 TC R24END

R1047 RFF 1 24,3322 0 5353 1 TC R24END

R1048 RFF 1 24,3323 0 5353 1 TC R24END

R1049 RFF 1 24,3324 0 5353 1 TC R24END

R1050 RFF 1 24,3325 0 5353 1 TC R24END

R1051 RFF 1 24,3326 0 5353 1 TC R24END

R1052 RFF 1 24,3327 0 5353 1 TC R24END

R1053 RFF 1 24,3328 0 5353 1 TC R24END

R1054 RFF 1 24,3329 0 5353 1 TC R24END

R1055 RFF 1 24,3330 0 5353 1 TC R24END

R1056 RFF 1 24,3331 0 5353 1 TC R24END

R1057 RFF 1 24,3332 0 5353 1 TC R24END

R1058 RFF 1 24,3333 0 5353 1 TC R24END

R1059 RFF 1 24,3334 0 5353 1 TC R24END

R1060 RFF 1 24,3335 0 5353 1 TC R24END

R1061 RFF 1 24,3336 0 5353 1 TC R24END

R1062 RFF 1 24,3337 0 5353 1 TC R24END

R1063 RFF 1 24,3338 0 5353 1 TC R24END

R1064 RFF 1 24,3339 0 5353 1 TC R24END

R1065 RFF 1 24,3340 0 5353 1 TC R24END

R1066 RFF 1 24,3341 0 5353 1 TC R24END

R1067 RFF 1 24,3342 0 5353 1 TC R24END

R1068 RFF 1 24,3343 0 5353 1 TC R24END

R1069 RFF 1 24,3344 0 5353 1 TC R24END

R1070 RFF 1 24,3345 0 5353 1 TC R24END

R1071 RFF 1 24,3346 0 5353 1 TC R24END

R1072 RFF 1 24,3347 0 5353 1 TC R24END

R1073 RFF 1 24,3348 0 5353 1 TC R24END

R1074 RFF 1 24,3349 0 5353 1 TC R24END

R1075 RFF 1 24,3350 0 5353 1 TC R24END

R1076 RFF 1 24,3351 0 5353 1 TC R24END

R1077 RFF 1 24,3352 0 5353 1 TC R24END

R1078 RFF 1 24,3353 0 5353 1 TC R24END

R1079 RFF 1 24,3354 0 5353 1 TC R24END

R1080 RFF 1 24,3355 0 5353 1 TC R24END

R1081 RFF 1 24,3356 0 5353 1 TC R24END

R1082 RFF 1 24,3357 0 5353 1 TC R24END

R1083 RFF 1 24,3358 0 5353 1 TC R24END

R1084 RFF 1 24,3359 0 5353 1 TC R24END

R1085 RFF 1 24,3360 0 5353 1 TC R24END

R1086 RFF 1 24,3361 0 5353 1 TC R24END

R1087 RFF 1 24,3362 0 5353 1 TC R24END

R1088 RFF 1 24,3363 0 5353 1 TC R24END

R1089 RFF 1 24,3364 0 5353 1 TC R24END

R1090 RFF 1 24,3365 0 5353 1 TC R24END

R1091 RFF 1 24,3366 0 5353 1 TC R24END

R1092 RFF 1 24,3367 0 5353 1 TC R24END

R1093 RFF 1 24,3368 0 5353 1 TC R24END

R1094 RFF 1 24,3369 0 5353 1 TC R24END

R1095 RFF 1 24,3370 0 5353 1 TC R24END

R1096 RFF 1 24,3371 0 5353 1 TC R24END

R1097 RFF 1 24,3372 0 5353 1 TC R24END

R1098 RFF 1 24,3373 0 5353 1 TC R24END

R1099 RFF 1 24,3374 0 5353 1 TC R24END

R1100 RFF 1 24,3375 0 5353 1 TC R24END

R1101 RFF 1 24,3376 0 5353 1 TC R24END

R1102 RFF 1 24,3377 0 5353 1 TC R24END

R1103 RFF 1 24,3378 0 5353 1 TC R24END

R1104 RFF 1 24,3379 0 5353 1 TC R24END

R1105 RFF 1 24,3380 0 5353 1 TC R24END

R1106 RFF 1 24,3381 0 5353 1 TC R24END

R1107 RFF 1 24,3382 0 5353 1 TC R24END

R1108 RFF 1 24,3383 0 5353 1 TC R24END

R1109 RFF 1 24,3384 0 5353 1 TC R24END

R1110 RFF 1 24,3385 0 5353 1 TC R24END

R1111 RFF 1 24,3386 0 5353 1 TC R24END

L P2C-P25

LSR'S PAGE NO. 25 E7 S3

0952	REF	138	LAST	517	24,3227	0 4616 1		TC	BANKCALL	
0953	REF	1			24,3231	55442 0		CADR	LRS24.1	
0955	REF	3	LAST	513	24,3231	0 6232 0	R24FNC	TC	KILLTASK	
0956	REF	1			24,3232	55643 0		CADR	CALLDCCH	
0957	REF	7	LAST	513	24,3233	0 6711 1		TC	CLRADMDD	CLEAR BITS 10 & 15 OF RADMCDES.
0958	REF	2	LAST	498	24,3234	1 2163 1		TCF	P24LEM1	AND GO TO 400 M1. RANGE CHECK IN P2C.
0959					6011			RLOCK	3	
0960	REF	1			6011			SETLCC	FFTAG6	
0961					6011			BANK		
0962	REF	1						COUNT*	\$1/P24	
0963	REF	1			6011	4 6071 0	CLRADMDD	CS	BIT10+15	
0964					6012	0 0004 0		INHINT		
0965	REF	36	LAST	510	6013	7 1110 0		MASK	RADMCDES	
0966	REF	37	LAST	518	6014	54 110 0		TS	RADMCDES	
0967	REF	28	LAST	506	6015	4 4752 1		CS	BIT2	DISABLE FR EPROR COUNTERS
0968					6016	0 0006 1		EXTEND		
0969	REF	27	LAST	515	6017	03 112 1		WAND	CHAN12	USER WILL RELINT
0970	REF	152	LAST	519	6020	0 0002 1		TC	Q	
0971					6021	41000 1	BIT10+15	CCT	41000	
0972					24,3235			BANK	24	
0973	REF	3	LAST	497	24,3235			SETLGC	P20S	
0974					24,3235			BANK		
0975	REF	2	LAST	517	TC 518:	22 22*		COUNT*	\$1/P24	
0976	REF	22	LAST	517	24,3235	0 5353 1	R24LEM3	TC	PHASCFNC	
0977					24,3236	0 4022 0		CCT	04022	
0978	REF	4	LAST	518	24,3237	0 6032 0		TC	KILLTASK	
0980	REF	2	LAST	518	24,3240	55643 0		CADR	CALLDCCH	KILL WAITLIST FOR NEXT POINT IN PATTERN
0981	REF	8	LAST	518	24,3241	0 6011 1		TC	CLRADMDD	CLEAR BITS 10 & 15 OF RADMCDES
0983	REF	1			24,3242	3 4774 1		CAF	.5SFC	
0984	REF	139	LAST	518	24,3243	0 4616 1		TC	BANKCALL	WAIT FOR DESIGNATE LOOP TO DIE
0985	REF	3	LAST	500	24,3244	0 1736 1		CADR	DELAYJOB	
0986	REF	9	LAST	511	24,3245	0 2670 1		TC	LUNSFCHK	CHECK IF ON LUNAR SURFACE
0987	REF	1			24,3246	0 3251 1		TC	R24LEM4	YES-DO NOT DO ATTITUDE MANEUVER
0988	REF	140	LAST	518	24,3247	1 4616 1		TC	BANKCALL	CALL R61 TO DO PREFERRED TRACKING
0989	REF	4	LAST	516	24,3250	46116 0		CADR	R61LFM	ATTITUDE MANEUVER
0990	REF	110	LAST	517	24,3251	3 4755 1	R24LEM4	CAF	ZERO	ZERO OUT RADCADR (WHICH WAS SET BY
0991	REF	2	LAST	223	24,3252	55303 1		TS	RADCADR	ENDRADAR WHEN DESIGNATE STOPPED) SO THAT
A0992										PROCESSM WILL RETURN TO CALLER
0993	REF	1			24,3253	0 3217 0		TC	R24LEM2	AND GO BACK TO PUT UP V16 N80 DISPLAY
0994					24,3254	04120 1	V16N80	VN	01680	

L P20-P25

LUSER'S PAGE NO. 26 E7 S3

R0995 PREFERRED TRACKING ATTITUDE ROUTINE RELEFM
 R0996 PROGRAM DESCRIPTION
 R0997 MOD NO : 3 DATE : 4-11-67
 R0998 MOD BY : P VLANTE SDC

R1000 FUNCTIONAL DESCRIPTION-
 R1001 TO COMPUTE THE PREFERRED TRACKING ATTITUDE OF THE LM TO ENABLE RR
 R1002 TRACKING OF THE DSM AND TO PERFORM THE MANEUVER TO THE PREFERRED
 R1003 ATTITUDE.
 R1004 CALLING SEQUENCE-
 R1005 TO BANKCALL
 R1006 CACP RELEFM
 R1007 SUBROUTINES CALLED
 R1008 LPS20.1, VECPOINT
 R1009 KALCMAN3

R1009 NORMAL EXIT MODES-
 R1010 NORMAL RETURN IS TO CALLER + 1
 R1011 ALARM OR ABORT EXIT MODES-
 R1012 TERMINATE P20 + R61 BY BRANCHING TO P20END IF BOTH TRACKELAG +
 R1013 RENDEZVOUS FLAG ARE NOT SET.
 R1014 CLIPCL -
 R1015 SEE OUTPUT FOR LPS20.1 + ATTITUDE MANEUVER ROUTINE (R60)
 R1016 SPASABLE INITIALIZATION REQUIRED
 R1017 GENRET USED TO SAVE G FOR RETLEFM
 R1018 FLAGS SET + RESET
 R1019 3AXISFLG
 R1020 DERRIS

R1021 SEE SUBROUTINES

1022	REF	1			23,2100			SFTLCC R61	
1023					23,2116			BANK	
1024	REF	17	LAST	515	27,1456			FBANK= LCSCCLNT	
1025	REF	1						COUNT# 11/R61	
1026	REF	4	LAST	475	23,2116	0 4645 1	R61LEFM	TC	MAKECACR
1027	REF	2	LAST	515	23,2117	55 142 0		TS	GENRET
1028	REF	31	LAST	517	23,2120	0 5504 0		TC	UPFLAG
1029	REF	1			23,2121	00024 1		ACRES	R61FLAG
1030	REF	1			23,2122	0 2152 0		TC	R61C+LC2
1031	REF	5	LAST	515	23,2123	0 4645 1	R65LEFM	TC	MAKECACR
1032	REF	2	LAST	515	23,2124	55 142 0		TS	GENRET
1033	REF	53	LAST	517	23,2125	0 5516 0		TC	DOWNFLAG
10331	REF	2	LAST	515	23,2126	00024 1		ACRES	R61FLAG
10332	REF	22	LAST	470	23,2127	3 4750 1	R61C+LC1	CAF	BIT4
10333					23,2130	0 0006 1		EXTEND	
10334	REF	10	LAST	506	23,2131	02 033 0		RAND	CHAN33
10335	REF	168	LAST	510	23,2132	10 000 0		CCS	A
1034	REF	2	LAST	515	23,2133	1 2152 1		TCF	R61C+LC2
10341	REF	32	LAST	515	23,2134	0 5504 0		TC	UPFLAG

SET R61 FLAG
 RESET R61 FLAG
 BYPASS FACAR READING IF DATA
 GOOD NOT PRESENT
 NO DATA GOOD

L P20-P25

USER'S PAGE NO. 27 E7 S3

10342	REF	6	LAST	498	23,2135	00063 1	ADPES	R04FLAG	PREVENT 521 ALM
10343	REF	141	LAST	518	23,2136	0 4616 1	TC	BANKCALL	REAC RR RANGE AND RDOT
10344	REF	3	LAST	509	23,2137	53112 0	CADP	RPRDOT	EVERY R65 PASS 12 TIMES
10345	REF	142	LAST	520	23,2140	0 4616 1	TC	BANKCALL	EFFECT FIRST MARK, ONCE
10346	REF	8	LAST	511	23,2141	17746 0	CADR	RADSTALL	CUPING ANY MARK PROCESSING,
10347					23,2142	12 143 1	NOOP		
10348	REF	143	LAST	520	23,2143	0 4616 1	TC	BANKCALL	
10349	REF	2	LAST	493	23,2144	53114 0	CADR	RRRANGE	
1035	REF	144	LAST	520	23,2145	0 4616 1	TC	BANKCALL	
10351	REF	9	LAST	520	23,2146	17774 0	CADR	RADSTALL	
10352					23,2147	12 150 0	NOOP		
10353	REF	54	LAST	515	23,2150	0 5516 0	TC	DOWNFLAG	
10354	REF	7	LAST	520	23,2151	00062 1	ADPES	R04FLAG	
10355	REF	12	LAST	507	23,2152	3 4747 1	CAF	TRACKBIT	TRACKFLAG
1036	REF	35	LAST	506	23,2153	7 0075 1	MASK	STATE +1	
1037					23,2154	0 0006 1	EXTEND		
1038	REF	1			23,2155	1 2314 1	BZF	R65WAIT	NOT SET
1039	REF	43	LAST	513	23,2156	0 6042 1	TC	INTERPRET	
1040					23,2157	77775 1	VLOAD		
1041	REF	4	LAST	490	23,2160	06516 0		HIUNITZ	
1042	REF	21	LAST	485	23,2161	03765 0	STORE	SCAXIS	TRACK AXIS UNIT VECTOR
1043					23,2162	43234 0	R61LEMI	RTB	
1044	REF	11	LAST	513	23,2163	21574 1		LOADTIME	EXTRAPOLATE FORWARD TO CENTER
1046	REF	1			23,2164	15712 1		3SFCOND5	SIX SECOND PERIOD.
1047	REF	15	LAST	512	23,2165	34041 0	STCALL	TEFC1	
1048	REF	4	LAST	512	23,2166	51255 1		LPS20.1	LCS DETERMINATION + VEF ATTITUDE
1049					23,2167	77775 1	VLOAD		
105	REF	2	LAST	102	23,2170	01101 1		RRTARGET	
1051	REF	4	LAST	483	23,2171	03773 1	STORE	PCINTVSM	
1052					23,2172	45034 1	RTB	CALL	GET DESIRED CDU'S FOR VECPT1
10525	REF	1			23,2173	46322 0		REACCODE	
1053	REF	1			23,2174	56032 0		VECPNT1	COMPUTES FINAL ANGLES FROM PRESENT CDUS
1054	REF	8	LAST	475	23,2175	00322 1	STORE	CPHI	STORE FINAL ANGLES - CPH1,CTHETA,CPSI
1055					23,2176	77776 1	EXIT		
1056	REF	23	LAST	518	23,2177	0 5353 1	TC	PHASCHNG	
1057					23,2200	04022 1	CCT	04022	
1058	REF	13	LAST	520	23,2201	2 4747 1	CAF	TRACKBIT	IS TRACK FLAG SET
1059	REF	24	LAST	508	23,2202	7 0075 1	MASK	FLAGWPD1	
1060					23,2203	0 0006 1	EXTEND		
1061	REF	2	LAST	520	23,2204	1 2314 1	BZF	R65WAIT	
1062	REF	145	LAST	520	23,2205	0 4616 1	TC	BANKCALL	
1063	REF	2	LAST	476	23,2206	54261 0	CADR	G+N,ALTC	CHECK FOR AUTO MODE
1064	REF	169	LAST	515	23,2207	10 0001 0	CCS	A	
1065	REF	1			23,2210	0 2302 1	TC	R61C+L04	NOT IN AUTO
1072	REF	44	LAST	520	23,2211	0 6042 1	TC	INTERPRET	
1073					23,2212	45175 1	VLOAD	CALL	
1074	REF	3	LAST	520	23,2213	01101 0		RRTARGET	
1075	REF	1			23,2214	47650 1		CDL*SMNB	
1076					23,2215	45345 1	VLOAD	DSU	GET PHI - ARCCOS OF Z-COMPONENT OF LCS
1077	REF	239	LAST	507	23,2216	00162 1		MFAC +5	

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1079	REF	1		23,2217	06320 0		CCS15DEG	
1080				23,2220	77440 1	R61LEM2	BANK	EXIT
1082	REF	1		23,2221	46236 1		R61C+L05	BRANCH - PHI > 15 DEGREES PHI GRE 10DEG
1083	REF	9	LAST	370	E6,1635		EBANK=	CDLXD
1085	REF	4	LAST	295	23,2222	3 5015 0	CAF	EBANK6
1086	REF	15	LAST	462	23,2223	54 0013 0	TS	EBANK
1087				23,2224	0 0004 0		INFINT	
1088				23,2225	0 0006 1		EXTEND	
1089	REF	9	LAST	520	23,2226	3 0322 1	DCA	CFHI
1090	REF	10	LAST	521	23,2227	52'636 1	DXCH	CDLXD
1091	REF	4	LAST	480	23,2230	3 0323 0	CA	CPSI
1092	REF	2	LAST	370	23,2231	55'637 0	TS	CDLXD
1093				23,2232	0 0003 1		RFLINT	
1094	REF	18	LAST	519	23,2233	3 5016 0	EBANK=	LOSOCUNT
1095	REF	2	LAST	388	23,2233	3 5016 0	CAF	EBANK7
1096	REF	16	LAST	521	23,2234	54 0003 0	TS	EBANK
1097	REF	1			23,2235	0 2261 0	TC	R61C+L06
1098					23,2236	77776 1	R61C+L05	EXIT
1099					23,2237	0 0004 0	INFINT	
1100	REF	19	LAST	515	23,2240	0 4674 0	TC	IBNKCALL
1101	REF	3	LAST	364	23,2241	40154 0	FCADR	ZATTPCR
1102	REF	20	LAST	521	23,2242	0 4674 0	TC	IBNKCALL
1103	REF	2	LAST	515	23,2243	40141 1	FCADR	SETMINDE
1104	REF	55	LAST	520	23,2244	0 5516 0	TC	DOWNFLAG
1105	REF	5	LAST	487	23,2245	00124 0	ADRES	3AXISFLC
1106	REF	23	LAST	519	23,2246	0 5504 0	TC	UPFLAG
1107	REF	2	LAST	477	23,2247	00077 1	ADRES	PDSPFLAG
1108	REF	146	LAST	520	23,2250	0 4616 1	TC	PANKCALL
1109	REF	3	LAST	487	23,2251	54123 0	CADR	R60LEM
1110					23,2252	0 0004 0	INFINT	
1111	REF	21	LAST	521	23,2253	0 4674 0	TC	IBNKCALL
1112	REF	5	LAST	515	23,2254	40115 0	FCADR	RESTCRDR
1113	REF	24	LAST	520	23,2255	0 5353 1	TC	PHASCHNC
1114					23,2256	04022 0	CCT	04022
1115	REF	56	LAST	521	23,2257	0 5516 0	TC	DOWNFLAG
1116	REF	3	LAST	521	23,2260	00077 1	ADRES	PDSPFLAG
1117	REF	25	LAST	520	23,2261	2 0075 0	R61C+L06	CA
1118	REF	1			23,2262	7 4742 0	MASK	R61FLBIT
1119	REF	170	LAST	520	23,2263	10 000 0	CCS	A
1120	REF	1			23,2264	0 2305 0	TC	R61C+L4
1123	REF	2	LAST	509	23,2265	11'745 1	CCS	R65CATR
1124					23,2266	0 2270 0	TC	+2
1125	REF	2	LAST	521	23,2267	0 2305 0	TC	R61C+L4
1126	REF	4	LAST	521	23,2270	55'745 1	TS	R65CATR
1127	REF	1			23,2271	3 2321 0	CAF	46SEC
1129	REF	8	LAST	505	23,2272	0 5173 1	TC	TWIDDLE
1130	REF	1			23,2273	02275 0	ADRES	R61C+L2
1131	REF	87	LAST	516	23,2274	0 5155 0	TC	ENDCFJCB
1132	REF	8	LAST	513	23,2275	3 7717 1	R61C+L2	CAF
1133	REF	21	LAST	513	23,2276	0 5105 0	TC	FINDVAC

REDUCE ATTITUDE ERROR

SET PRIORITY DISPLAY FLAG

RESET PRIORITY DISPLAY FLAG

R65CATR = 0 - EXIT ROUTINE

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1134	RFF	19	LAST	521	E7,1456		FBANK=	LCSCCUNT	
1135	RFF	1			23,2277	02127 1	2CADP	R61C+L01	
1135	RFF	1			23,2300	46767 1			
1136	RFF	22	LAST	513	23,2301	0 5261 1	TC	TASKOVER	
1137	RFF	147	LAST	521	23,2302	0 4616 1	R61C+L04	TASKCALL	TC CONVERT ANGLES TO FCAI
1138	RFF	4	LAST	476	23,2303	54272 1	CADR	BALLANGS	
1139	RFF	2	LAST	521	23,2304	0 2261 0	TC	R61C+L06	
1140	RFF	4	LAST	519	23,2305	217142 1	R61C+L4	GENRET	
1141	RFF	8	LAST	481	23,2306	1 4640 0	TCF	BANKJUMP	EXIT R61
1142	RFF	1			23,2307	3 2316 1	R61C+L1	CAF	IS RENCF2VCUS OR P25FLAG SET
1143	RFF	36	LAST	520	23,2310	7 0074 0	MASK	STATE	
1144					23,2311	0 0006 1	EXTEND		
1145	RFF	88	LAST	521	23,2312	1 5155 1	BZF	ENDCFJCB	NO-EXIT ROUTINE AND PROGRAM.
1146	RFF	3	LAST	522	23,2313	0 2261 0	TC	R61C+L06	YES EXIT ROUTINE
11463	RFF	36	LAST	471	23,2314	0 4635 0	R65WAIT	PCSTJUMP	
11466	RFF	6	LAST	513	23,2315	50232 1	CADR	P20LEMT	
1147					23,2316	00500 1	RIT7+9PV	QCT	00500
1148					23,2317	17350 1	CCS15DEG	2DEC	0.96593 P-1
1148					23,2317	34672 1			
1149					23,2321	01130 1	06SFC	DFC	600
1150					1124		PHI	EQUALS	200
1152					23,2322	0 0004 0	READCCUC	INFINT	READS DESIRED CDU'S AND STORES IN
11521	RFF	5	LAST	521	23,2323	3 5015 0	CAF	EBANK6	MFAC TP EXITS WITH MODE SET TO TP
11522	RFF	17	LAST	521	23,2324	56 0003 1	XCF	EBANK	
11523	RFF	20	LAST	258	23,2325	54 0070 1	TS	SUPTREG1	
11524	RFF	11	LAST	521	56,1625		FRANK=	CDUXD	
11525	RFF	12	LAST	522	23,2326	3 1635 0	CA	CDUXD	
11526	RFF	240	LAST	520	23,2327	54 154 0	TS	MFAC	
11527					23,2330	0 0006 1	EXTEND		
11528	RFF	2	LAST	370	23,2331	3 1637 1	CCA	CDUYD	
11529	RFF	241	LAST	522	23,2332	52 156 1	DXCF	MFAC +1	
1153	RFF	21	LAST	522	23,2333	3 0070 0	CA	RUPTRREG1	
11531	RFF	18	LAST	522	23,2334	54 0003 0	TS	EBANK	
11532					23,2335	0 0003 1	RELINT		
11533	RFF	1			23,2336	1 6532 1	TCF	TMODE	
1155					4512		PLECK	02	
1156	RFF	1			4000		SETLCC	KACARFF	
1157					4512		BANK		
1158	RFF	20	LAST	522	E7,1456		FBANK=	LCSCCUNT	
1159	RFF	1					COUNT*	\$\$\$RPSUB	

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P1160 THE FOLLOWING SUBROUTINE RETURNS TO CALLER + 2 IF THE ABSOLUTE VALUE OF VALUE OF C(A) IS GREATER THAN THE
 P1162 NEGATIVE OF THE NUMBER AT CALLER +1. OTHERWISE IT RETURNS TO CALLER +3. MAY BE CALLED IN RPT OR UNDER EXEC.

1164		4512	0 0016 1	MAGSUE	EXTEND	
1165		4513	6 4515 1		BZMF	+2
1166		4514	1 4516 0		TCF	+2
1167		4515	4 0001 0		CCM	
1168	REF 153 LAST 518	4516	50 002 0		INDEX	0
1169		4517	6 0000 1		AD	0
1170		4520	0 0016 1		EXTEND	
1171	REF 1	4521	6 6744 0		BZMF	Q+2
1172	REF 3 LAST 268	4522	1 6742 1		TCF	Q+1

ABS(A) <= CCNST GO TC L+3
 ABS(A) > CCNST GO TC L+2

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P1173 PROGRAM NAME_ RRLIMCHK

ARE IN THE LIMITS OF THE CURRENT MODE.

R1175 FUNCTIONAL DESCRIPTION_

R1176 RRLIMCHK CHECKS RE DESIRED GIMBAL ANGLES TO SEE IF THEY ARE WITHIN

R1177 THE LIMITS OF THE CURRENT MODE. INITIALLY THE DESIRED TRUNNION AND

R1178 SHAFT ANGLES ARE STORED IN ITEMP1 AND ITEMP2. THE CURRENT PR

P1179 ANTENNA MODE (ADMCDOS BIT 12) IS CHECKED WHICH IS = 0 FOR

R1180 MODE 1 AND =1 FOR MODE 2.

R1181 MODE 1 - THE TRUNNION ANGLE IS CHECKED AT MAGSUB TO SEE IF IT IS

R1182 BETWEEN -55 AND +55 DEGREES. IF NOT, RETURN TO L +2. IF WITHIN LIMITS,

R1183 THE SHAFT ANGLE IS CHECKED TO SEE IF IT IS BETWEEN -70 AND +55 DEGREES.

R1184 IF NOT, RETURN TO L +2. IF IN LIMITS, RETURN TO L +3.

R1185 MODE 2 - THE SHAFT ANGLE IS CHECKED AT MAGSUB TO SEE IF IT IS

R1186 BETWEEN -139 AND -25 DEGREES. IF NOT, RETURN TO L +2. IF WITHIN

R1187 LIMITS, THE TRUNNION ANGLE IS CHECKED TO SEE IF IT IS BETWEEN +125

P1188 AND -125 (+235) DEGREES. IF NOT, RETURN TO L +2. IF IN LIMITS, RETURN

R1189 TO L +3.

R1190 CALLING SEQUENCE:

R1191 L TO RRLIMCHK (WITH INTERRUPT INHIBITED)

R1192 L +1 ADDRESS T,S (DESIRED TRUNNION ANGLE ADDRESS)

P1193 ERASABLE INITIALIZATION REQUIRED:

R1194 ADMCDOS, MODEA, MODEP (OR DESIRED TRUNNION AND SHAFT

R1195 ANGLES ELSEWHERE IN CONSECUTIVE LOCATIONS - UNSWITCHED ERASABLE OR

R1196 CURRENT FRANK).

R1197 SUBROUTINES CALLED_ MAGSUB

R1198 JOBS OR TASKS INITIATED_ NONE

R1199 ALARMS_ NONE

R1200 EXIT_ L + 2 (EITHER OR BOTH ANGLES NOT WITHIN LIMITS OF CURRENT MODE)

R1201 L + 3 (BOTH ANGLES WITHIN LIMITS OF CURRENT MODE)

1202 REF 154 LAST 523 4523 0 0006 1 RRLIMCHK EXTEND

1203 4524 5 0002 0 INDEX 0

1204 4525 5 0000 1 INDEX 0

1205 4526 3 0001 0 DCA 0

1206 REF 155 LAST 524 4527 24 002 0 TACR 0

1207 REF 6 LAST 258 4530 52 062 1 EXCH ITEMP1

1208 REF 156 LAST 524 4531 22 002 0 LXCH 0

L(CALLER +2) TO L.

1209 REF 2 LAST 324 4532 3 4740 0 CAF ANTENBIT

SEE WHICH MODE RR IS IN.

1210 REF 38 LAST 518 4533 7 0110 0 MASK ADMCDOS

1211 REF 171 LAST 521 4534 10 000 0 CCS A

1212 REF 1 4535 1 4550 1 TCF MODE2CHK

1213 REF 7 LAST 524 4536 3 0061 0 CA ITEMP1

MODE 1 IS DEFINED AS

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1214	REF	1		4537	0 4512 0	TC	MAGSLP	1. AES(T) L 55 DEGS.
1215				4540	66161 1	DEC	-.30555	2. AES(S + 5.5 DEGS) L 64.5 DEGS
1216	REF	62	LAST	4541	0 0001 0	TC	L	(SHAFT LIMITS AT +55, -70 DEGS)
1217	REF	1		4542	3 4562 1	CAF	5.5DEGS	
1218	REF	3	LAST	4543	6 0162 0	AC	ITEMP2	S
1219	REF	2	LAST	4544	0 4512 0	TC	MAGSLP	
1220				4545	6442 0	DEC	-.35833	64.5 DEGS
1221	REF	64	LAST	4546	0 0001 0	TC	L	
1222	REF	1		4547	0 4560 0	TC	RRLIMCK	IN LIMITS.
1223	REF	1		4550	3 4553 0	MODE2CHK	CAF	82DEGS
1224	REF	4	LAST	4551	6 0062 0	AF	ITEMP2	MODE 2 IS DEFINED AS
1225	REF	3	LAST	4552	0 4512 0	TC	MAGSLE	1. ABS(T) G 125 DEGS.
1226				4553	65673 0	DEC	-.31667	2. AES(S + 82 DEGS) L 57 DEGS
1227	REF	65	LAST	4554	0 0001 0	TC	L	(SHAFT LIMITS AT -25, -139 DEGS)
1228	REF	8	LAST	4555	3 0061 0	CA	ITEMP1	
1229	REF	4	LAST	4556	0 4512 0	TC	MAGSLP	
1230				4557	51615 1	DEC	-.69444	125 DEGS
1231	REF	66	LAST	4560	50 001 0	PPLIMCK	INDEX	L
1232	REF	67	LAST	4561	0 0001 0	TC	L	(= TC 1)
1233				4562	00765 0	5.5DEGS	DEC	.03056
1234				4563	16450 1	82DEGS	DEC	.45556

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P1235 PROGRAM NAME_ SETTRKF

. IF EITHER:

R1237 FUNCTIONAL DESCRIPTION_

R1238 SETTRKF UPDATES THE TRACKER FAIL LAMP ON THE DSKY.

HFR THE ALT OR VEL INFORMATION.

R1240 INITIALLY THE LAMP TEST FLAG (IMODES33 BIT 1) IS CHECKED.

R1241 IF A LAMP TEST IS IN PROGRESS, THE PROGRAM EXITS TO L +1.

R1242 IF NO LAMP TEST THE FOLLOWING IS CHECKED SEQUENTIALLY_

R1243 1) RR CDU'S BEING ZEROED, RR CDU CK, AND RR ACT IN

R1244 AUTO MODE (RADMODES BITS 13, 7, 2).

R1245 2) LR VEL DATA FAIL AND NO LR PCS DATA (RADMODES BITS

R1246 8, 5)

R1247 3) NO RR DATA (RADMODES BIT 4)

R1248 THE ABSENCE OF ALL THREE SIMULTANEOUSLY IN (1), THE PRESENCE OF BOTH

R1249 IN (2), AND THE PRESENCE OF (3) RESULTS IN EITHER THE TRACKER FAIL

R1250 LAMP (DSPTAB +110 BIT 8) BEING TURNED ON OR LEFT ON. OTHERWISE,

R1251 THE TRACKER FAIL LAMP IS TURNED OFF OR IS LEFT OFF. THEREFORE, THE

R1252 TRACKER FAIL LAMP IS TURNED ON IF_

R1253 A) RR CDU FAILED WITH CR IN AUTO MODE AND RR CDU'S NOT BEING ZEROED.

R1254 B) N SAMPLES OF LR DATA COULD NOT BE TAKEN IN 2N TRIES WITH

R1255 EITHER THE ALT OR VEL INFORMATION

R1256 C) N SAMPLES OF RR DATA COULD NOT BE OBTAINED FROM 2N TRIES

R1257 WITH EITHER THE AL

R1258 CALLING SEQUENCE:

R1259 L TO SETTRKF

R1260 ERASABLE INITIALIZATION REQUIRED: IMODES33, RADMODES, DSPTAB +110

R1261 SUBROUTINES CALLED_ NONE

R1262 JOBS OR TASKS INITIATED_ NONE

R1263 ALARMS_ TRACKER FAIL LAMP

P1264 EXIT_ L +1 (ALWAYS)

ED.

1266	RFF	26	LAST	466	4564	3	4753	1	SETTRKF	CAF	BIT1	NO ACTION IF DURING LAMP TEST.
1267	RFF	25	LAST	472	4565	7	1370	1		MASK	IMODES33	
1268	RFF	172	LAST	524	4566	10	010	0		CCS	A	
1269	RFF	157	LAST	524	4567	0	0002	0		TC	Q	

1270	RFF	25	LAST	335	4570	3	4744	1	RPTPKF	CA	BIT8	
1271	RFF	68	LAST	525	4571	54	001	1		TS	L	

1272	RFF	2	LAST	186	4572	3	4615	1		CAF	13,7,2	SEE IF CDU FAILED.
1273	RFF	39	LAST	524	4573	7	011	0		MASK	RADMODES	

1274					4574	0	0006	1		EXTEND		
1275	RFF	1			4575	1	4601	0		BZF	TRKFLOD	CONDITION 3 ABOVE.

1276	RFF	1			4576	3	4753	1	RRCHECK	CAF	RACATBT	SEE IF RR DATA FAILED.
1277	RFF	40	LAST	526	4577	7	011	0		MASK	RADMODES	

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1278	REF	173	LAST	526	4600	10 000 0		CCS	A		
1279	REF	69	LAST	526	4601	3 0001 0	TRKFLEN	CA	L		
1280	REF	39	LAST	473	4602	6 1035 0		AD	DSPTAB +110	HALF ADD DESIRED AND PRESENT STATES.	
1281	REF	70	LAST	527	4603	7 0001 1		MASK	L		
1282					4604	0 0006 1		EXTEND			
1283	REF	4	LAST	275	4605	1 6745 0		BZF	TCC	NO CHANGE.	
1284	REF	41	LAST	527	4606	3 1035 0	FLIP	CA	DSPTAB +110	CANT USE LXCH DSPTAB +110 (RESTART PROB)	
1285					4607	0 0006 1		EXTEND			
1286	REF	10	LAST	255	4608	06 001 0		RXR	LCPAN		
1287	REF	11	LAST	434	4611	7 4733 0		MASK	PCSMAX		
1288	REF	30	LAST	510	4612	6 4735 1		AD	BIT15		
1289	REF	41	LAST	527	4613	55 0035 1		TS	DSPTAB +110		
1290	REF	158	LAST	526	4614	0 0002 0		TC	Q		
1291					4615	10102 0	13,7,2	CCT	10102		
1292					4616		ENDRMCDF	EQUALS			

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P1293 PROGRAM NAME_ RPTLRNOM

R1294 FUNCTIONAL DESCRIPTION_

R1295 RPTLRNOM IS THE TURN-ON SEQUENCE WHICH, ALONG WITH
R1296 PRZEPCSE, ZEPDS THE CDU'S AND DETERMINES THE RR MODE.

R1297 INITIALLY, CONTROL IS TRANSFERRED TO PRZEPCSE FOR THE

R1298 ACTUAL TURN-ON SEQUENCE. UPON RETURN THE PROGRAM

R1299 WAITS 1 SECOND BEFORE REMOVING THE TURN-ON FLAG

R1300 (RADMODES BIT1) SO THE REPOSITION WENT

R1301 INITIATE PROGRAM ALARM (501). A CHECK IS THEN MADE

R1302 TO SEE IF A PROGRAM IS USING THE RR (STATE BIT 7). IF

R1303 SO, THE PROGRAM EXITS TO ENDPADAR SO THAT THE PR CDL

R1304 FAIL FLAG (RADMODES BIT 7) CAN BE CHECKED BEFORE

R1305 RETURNING TO THE WAITING PROGRAM. IF ACT, THE PROGRAM EXITS

R1306 TO TASKOVER.

R1307 CALLING SEQUENCE: WAITLIST TASK FROM RPAUTCHK IF THE RR POWER ON ALTO

R1308 BIT (CHAN 32 BIT 2) CHANGES TO 0 AND NO PROGRAM WAS USING

R1309 THE RR (STATE BIT 7).

R1310 FRASABLE INITIALIZATION REQUIRED:

R1311 RADMODES, STATE

R1312 SUBROUTINES CALLED_ PRZEPCSE, FIXDELAY, TASKOVER, ENDPADAR

R1313 JOBS OR TASKS INITIATED_

P1314 NONE

P1315 ALARMS_ NONE (SEE PRZEPCSE)

R1316 EXIT_ TASKOVER, ENDPADAR (WAITING PROGRAM)

1317 24,3255

1318 RFF 1 25,2000

1319 25,2073

BANK 24

SFTLOC P2C51

BANK

1320 RFF 21 LAST 522 F7,1456

1321 RFF 1

EBANK= LCSCCLNT

COUNT# \$4/RSUB

1322 RFF 1 25,2073 0 2102 0 RRTLRNOM

TC PRZEPCSE

1323 RFF 3 LAST 501 25,2074 0 5221 0

TC FIXDELAY

WAIT 1 SEC BEFORE REMOVING TURN ON FLAG

1324 25,2075 00144 1

DEC 100

SO A MONITOR REPOSITION WENT ALARM.

1325 RFF 1 25,2076 4 4753 0

CS TURNCHET

1326 RFF 41 LAST 526 25,2077 7 0111 0

MASK RADMODES

1327 RFF 42 LAST 528 25,2100 54 111 1

TS RADMODES

1328 RFF 23 LAST 522 25,2101 1 5261 0

TCF TASKOVER

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P1329 PROGRAM NAME_ PRZEPFSB

P1330 FUNCTIONAL DESCRIPTION

R1331 PRZEPFSB IS A CLOSED SUBROUTINE TO ZERO THE RR CDU'S,

R1332 DET RMINE THE RR MODE, AND TURNS ON THE TRACKER FAIL

R1333 LAMP IF REQUIRED. INITIALLY THE RR CDU ZERO BIT (CHAN 12

R1334 BIT 1) IS SET. FOLLOWING A 2" MILLISECOND WAIT, THE LCC

R1335 RR CDU COUNTERS (OPTV, OPTX) ARE SET = 0 AFTER

R1336 WHICH THE RR CDU ZERO DISCRETE (CHAN 12 BIT 1) IS

R1337 REMOVED. A 4 SECOND WAIT IS SET TO ALL THE RR CDL'S

R1338 TO REPEAT THE ACTUAL TRAUNION AND SHAFT ANGLES. THE

R1339 RR CDU ZERO FLAG (RADMODES BIT 13) IS REMOVED. THE

R1340 CONTENTS OF OPTV IS THEN CHECKED TO SEE IF THE TRAUNION

R1341 ANGLE IS LESS THAN 90 DEGREES. IF ACT, BIT 12 OF

R1342 RADMODES IS SET = 1 TO INDICATE RR ANTENNA MODE 2.

R1343 IF LESS THAN 90 DEGREES, BIT 12 OF RADMODES IS SET = 0 TO

R1344 INDICATE RR ANTENNA MODE 1. SETTRKF IS THEN CALLED TO

R1345 SEE IF THE TRACKER FAIL LAMP SHOULD BE TURNED ON.

R1346 CALLING SEQUENCE: L TO PRZEPFSB (FROM RTUPNON AND PRZEPF)

P1347 ERASABLE INITIALIZATION REQUIRED:

R1348 RADMODES (BIT 12 SET), DSPTAB +110

R1349 SUBROUTINES CALLED_ FIXDELAY, VAGSUE, SETTRKF

R1350 JOBS OR TASKS INITIATED_

R1351 NCAF

R1352 ALARMS_ TRACKER FAIL

R1353 EXIT_ L +1 (ALWAYS)

1354 25,2102 0 0006 1 PRZEPFSB EXTEND

1355 RFF 2 LAST 106 25,2103 23 012 0 GXCH RRRFT

1356 RFF 27 LAST 526 25,2104 3 4753 1 CAF BIT1

1357 25,2105 0 0006 1 EXTEND

BIT 13 OF RADMODES MUST BE SET BEFORE
COMING HERE.

1358 RFF 28 LAST 518 25,2106 05 012 1 WCR CHAN12

1359 RFF 4 LAST 528 25,2107 0 5221 0 TC FIXDELAY

1360 25,2108 00002 0 DEC 2

TURN ON ZERO RR CDU

1361 RFF 111 LAST 518 25,2111 3 4755 1 CAF ZEPG

1362 RFF 5 LAST 515 25,2112 54 035 0 TS CDLT

1363 RFF 4 LAST 317 25,2113 54 036 0 TS CCUS

1364 RFF 44 LAST 509 25,2114 4 4753 0 CS ONE

1365 25,2115 0 0006 1 EXTEND

REMOVE ZERGING BIT.

1366 RFF 29 LAST 529 25,2116 03 012 1 WANC CHAN12

1367 RFF 5 LAST 529 25,2117 0 5221 0 TC FIXDELAY

1368 25,2120 01750 1 DEC 1000

RESET FAIL INHIBIT IN 10 SECS - D.281

1369 RFF 3 LAST 507 25,2121 4 4737 1 CS RCDUDET

REMOVE ZEPG INC IN PROCESS BIT.

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1370	REF	43	LAST	528	25,2122	7 3110 0	MASK	RACMCCFS	
1371	REF	44	LAST	530	25,2123	54 110 0	TS	RACMCCFS	
1372	REF	6	LAST	529	25,2124	3 0035 1	CA	CDLT	
1373	REF	5	LAST	525	25,2125	0 4512 0	TC	MAGSUE	
1374					25,2126	57777 1	DEC	-0.5	
1375					25,2127	1 2132 1	TCF	+2	IF MCCE 2.
1376	REF	112	LAST	529	25,2130	3 4755 1	CAF	ZERO	
1377					25,2131	1 2133 0	TCF	+2	
1378	REF	3	LAST	524	25,2132	3 4741 0	CAF	ANTENBIT	
1379	REF	45	LAST	530	25,2133	56 110 1	XCH	RACMCCFS	
1380	REF	1			25,2134	7 7744 0	MASK	-BIT12	
1381	REF	46	LAST	530	25,2135	26 110 0	ACS	RACMCCFS	
1382	REF	2	LAST	186	25,2136	0 4564 1	TC	SETTRKF	TRACKER LAMP MIGHT GO ON NOW.
1383	REF	3	LAST	529	25,2137	0 1312 0	TC	ERRFT	DEAF.
1384	REF	1			7744		-BIT12	EQUALS -1/8	IN SPRCT

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P1385 PROGRAM NAME_ DCRREPCS
 P1386 FUNCTIONAL DESCRIPTION_
 P1387 DCRREPCS IS A SEQUENCE OF TASKS TO DRIVE THE RENDEZVOUS RADAR
 R1388 TO A SAFE POSITION. INITIALLY SETPRECR IS CALLED WHERE THE RP
 R1389 ERROR COUNTERS (CHAN 12 BIT 2) ARE ENABLED AND LASTYCMD
 R1390 AND LASTXCMD SET = 0 TO INDICATE THE DIFFERENCE BETWEEN THE
 P1391 DESIRED STATE AND PRESENT STATE OF THE COMMANDS. THE RR
 R1392 TURN-ON FLAG (RACMODES BIT 1) IS CHECKED AND IF NOT PRESENT,
 R1393 PROGRAM ALARM CUECI IS REQUESTED BEFORE CONTINUING. IN EITHER
 R1394 CASE, FOLLOWING A 20 MILLISECOND WAIT THE PROGRAM CHECKS THE CURRENT
 P1395 RR ANTENNA MODE (RACMODES BIT 12). RRONLY IS THEN CALLED
 P1396 TO DRIVE THE TRUNNION ANGLE TO 0 DEGREES IF IN MODE 1 AND TO 180
 R1397 DEGREES IF IN MODE 2. UPON RETURN, THE CURRENT RR ANTENNA
 R1398 MODE (RACMODES BIT 12) IS AGAIN CHECKED. PRSCNLY IS THEN
 R1399 CALLED TO DRIVE THE SHAFT ANGLE TO 0 DEGREES IF IN MODE 1 AND TO
 P1400 -90 DEGREES IF IN MODE 2. IF DURING RRONLY OR RRONLY A
 P1401 REMODE HAS BEEN REQUESTED (RACMODES BIT 14), AND ALWAYS
 R1402 FOLLOWING COMPLETION OF PRSCNLY, CONTROL IS TRANSFERRED TO
 R1403 REPRERPT. HERE THE REPOSITION FLAG (RACMODES BIT 11) IS
 R1404 REMOVED. A CHECK IS THEN MADE ON THE DESIGNATE FLAG (RACMODES
 R1405 BIT 1). IF PRESENT, CONTROL IS TRANSFERRED TO RECCES. IF NOT PRESENT
 R1406 INDICATING NO FURTHER ANTENNA CONTROL REQUIRED, THE RR ERROR
 R1407 COUNTER BIT (CHAN 12 BIT 2) IS REMOVED AND THE ROUTINE EXITS TO
 R1408 TASKOVER.

R1409 CALLING SEQUENCE:
 R1410 WAITLIST CALL FROM RRCIMON IF TRUNNION AND SHAFT CDU ANGLES
 R1411 NOT WITHIN LIMITS OF CURRENT MODE.

R1412 FRASAELE INITIALIZATION REQUIRED:
 R1413 RACMODES

R1414 SUBROUTINES CALLED_
 R1415 RRONLY, RRONLY, RECCES (EXIT)

R1416 JOBS OR TASKS INITIATED_
 P1417 NONE

R1418 ALARMS- NONE

R1419 EXIT_ TASKOVER, RECCES

1420 REF 1 25,2140 0 2167 0 DCRREPCS TO SETPRECR SET UP RR CDU ERROR COUNTERS.

R1421 ALARM 501 DELETED IN RANGE 279 PER FOR 37.

1422 REF 6 LAST 529 25,2141 0 5221 0 TO FIXDELAY
1423 25,2142 00002 0 DEC 2

1424 REF 4 LAST 530 25,2143 3 4740 0 CAF ANTENBIT MANEUVER TRUNNION ANGLE TO NOMINAL PCS.

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1425	REF	47	LAST	530	25,2144	7 0110 0	MASK	RADMODES		
1426	REF	174	LAST	527	25,2145	10 000 0	CCS	A		
1427	REF	21	LAST	527	25,2146	3 4735 1	CAF	BIT15	0 FOR MODE 1 AND 180 FOR MODE 2.	
1428	REF	1			25,2147	0 2252 0	TC	PRONLY		
1429	REF	5	LAST	531	25,2150	3 4740 0	CAF	ANTENBIT	NOW PUT SHAFT IN RIGHT POSITION	
1430	REF	48	LAST	532	25,2151	7 0110 0	MASK	RADMODES		
1431	REF	175	LAST	532	25,2152	10 000 0	CCS	A		
1432	REF	5	LAST	510	25,2153	4 4736 0	CS	HALF	-90 FOR MODE 2.	
1433	REF	1			25,2154	0 2255 1	TC	PRONLY		
1434	REF	2	LAST	188	25,2155	4 4741 0	REFCSRFT	CS	REPCSRFT	RETURNS HERE FROM RR1AXIS IF REMODE REQUESTED DURING REPOSITION.
A1435									REMOVE REPCSRFT BIT.	
1436	REF	49	LAST	532	25,2156	7 0110 0	MASK	RADMODES		
1437	REF	50	LAST	532	25,2157	54 111 0	TS	RADMODES		
1438	REF	1			25,2160	7 4742 0	MASK	DESIGBIT	SEE IF SOMEONE IS WAITING TO DESIGNATE.	
1439	REF	176	LAST	532	25,2161	10 000 0	CCS	A		
1440	REF	2	LAST	512	25,2162	1 2604 0	TCF	BFGDES		
1441	REF	29	LAST	518	25,2163	4 4752 1	CS	BIT2	IF NO FURTHER ANTENNA CONTROL REQUIRED, REMOVE ERROR COUNTER ENABLE.	
1442					25,2164	0 0006 1	EXTEND			
1443	REF	20	LAST	525	25,2165	03 012 1	WAND	CHAN12		
1444	REF	24	LAST	528	25,2166	1 5261 0	TCF	TASKOVER		
1445	REF	30	LAST	532	25,2167	3 4752 0	SFTBRECPR	CAF	BIT2	SET UP RR ERROR COUNTERS.
1446					25,2170	0 0006 1	EXTEND			
1447	REF	31	LAST	532	25,2171	02 012 0	RAND	CHAN12		
1448	REF	177	LAST	532	25,2172	10 000 0	CCS	A	DO NOT CLEAR LAST COMMAND IF ERROR COUNTERS ARE ENABLED.	
1449	REF	159	LAST	527	25,2173	0 0002 0	TC	Q		
1450	REF	7	LAST	203	25,2174	54 112 1	TS	LASTXCMC		
1451	REF	1			25,2175	54 112 0	TS	LASTXCMC		
1452	REF	31	LAST	532	25,2176	3 4752 0	CAF	BIT2		
1453					25,2177	0 0006 1	EXTEND			
1454	REF	32	LAST	532	25,2200	05 012 1	WCR	CHAN12	ENABLE RR CCU ERROR COUNTERS.	
1455	REF	160	LAST	532	25,2201	0 0002 0	TC	Q		

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P1456 PROGRAM NAME_ REMODE
 P1458 FUNCTIONAL DESCRIPTION_
 R1461 REMODE IS THE GENERAL REMODING SUBROUTINE. IT DRIVES THE
 R1461 TRUNNION ANGLE TO 0 DEGREES IF THE CURRENT MODE IS MODE 1,
 P1462 180 DEGREES FOR MODE 2, THEN DRIVES THE SHAFT ANGLE TO -45
 P1463 DEGREES, AND FINALLY DRIVES THE TRUNNION ANGLE TO -130 DEGREES,
 R1464 TO PLACE THE RR IN MODE 2, -50 DEGREES FOR MODE 1, BEFORE
 P1465 INITIATING 2-AXIS CONTROL. ALL REMODING IS DONE WITH SINGLE
 R1466 AXIS ROTATIONS (RR1AXIS). INITIALLY THE RR ANTENNA MODE FLAG
 R1467 (RADMODES BIT 12) IS CHECKED. CONTROL IS THEN TRANSFERRED TO
 P1468 PRONLY TO DRIVE THE TRUNNION ANGLE TO 0 DEGREES IF IN MODE 1
 R1469 OR 180 DEGREES IF IN MODE 2. PRONLY IS THEN CALLED TO DRIVE
 P1470 THE SHAFT ANGLE TO -45 DEGREES. THE RR ANTENNA MODE FLAG
 P1471 (RADMODES BIT 12) IS CHECKED AGAIN. CONTROL IS AGAIN
 R1472 TRANSFERRED TO PRONLY TO DRIVE THE TRUNNION ANGLE TO -130
 P1473 DEGREES TO PLACE THE RR IN MODE 2 IF CURRENTLY IN MODE 1 OR TO
 P1474 -50 DEGREES IF IN MODE 2 TO PLACE THE RR IN MODE 1. RMODINV
 R1475 IS THEN CALLED TO SET RADMODES BIT 12 TO INDICATE THE NEW
 R1476 RR ANTENNA MODE. THE REMODE FLAG (RADMODES BIT 14)
 R1477 IS REMOVED TO INDICATE THAT REMODING IS COMPLETE. THE PROGRAM
 P1478 THEN EXITS TO STDOSIG TO BEGIN 2-AXIS CONTROL.

R1479 CALLING SEQUENCE:
 P1480 FROM BEGDS WHEN REMODE FLAG (RADMODES BIT 14) IS SET.
 R1481 THIS FLAG MAY BE SET IN RDESSM AND RDESNB IF RPLINCHK
 P1482 DETERMINES THAT THE DESIRED ANGLES ARE WITHIN THE LIMITS OF THE
 R1483 OTHER MODE.

R1484 ERASABLE INITIALIZATION REQUIRED:
 R1485 RADMODES

R1486 SUBROUTINES CALLED_
 R1487 PRONLY, PRONLY, RMODINV (ACTUALLY PART OF)

R1488 JOBS OR TASKS INITIATED_
 R1489 NONE

R1490 ALARMS_ NONE

R1491 EXIT_ STDOSIG

1492	REF	6	LAST	532	25,2202	3	4740	1	REMODE	CAF	ANTENBIT	DRIVE TRUNNION TO 0 (180)
1493	REF	51	LAST	532	25,2203	7	0110	0		MASK	RADMODES	(ERROR COUNTER ALREADY ENABLED)
1494	REF	178	LAST	532	25,2204	10	000	0		CCS	A	
1495	REF	32	LAST	532	25,2205	3	4735	1		CAF	BIT15	
1496	REF	2	LAST	532	25,2206	1	2252	0		TC	PRONLY	
1497	REF	1			25,2207	3	7743	0		CAF	-45DEGR	
1498	REF	2	LAST	532	25,2210	1	2255	1		TC	PRONLY	

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1499	PEF	52	LAST	533	25,2211	4 0110 0	CS	RADMODES	
1500	REF	7	LAST	533	25,2212	7 4740 1	MASK	ANTENBIT	
1501	REF	179	LAST	533	25,2213	10 000 0	CCS	A	
1502	REF	1			25,2214	3 2243 0	CAF	-80DEGSR	GO TO T = -130 (-50).
1503	REF	1			25,2215	6 2242 1	AC	-50DLGSR	
1504	PEF	3	LAST	533	25,2216	0 2252 0	TC	PRTCNLY	
1505	PEF	53	LAST	534	25,2217	4 0110 0	CS	RADMODES	
1506	PEF	8	LAST	534	25,2220	7 4740 1	MASK	ANTENBIT	
1507	PEF	180	LAST	534	25,2221	10 000 0	CCS	A	
1508	PEF	33	LAST	533	25,2222	3 4735 1	CAF	RIT15	GO TO T = -180 (+0).
1509	REF	4	LAST	534	25,2223	0 2252 0	TC	PRTCNLY	
1510	PEF	54	LAST	534	25,2224	4 0110 0	CS	RADMODES	GO TO S = -90 (+0).
1511	REF	9	LAST	534	25,2225	7 4740 1	MASK	ANTENBIT	
1512	PEF	181	LAST	534	25,2226	10 000 0	CCS	A	
1513	REF	6	LAST	532	25,2227	4 4736 1	CS	HALF	
1514	PEF	3	LAST	533	25,2220	0 2255 1	TC	PRTCNLY	
1515	REF	1			25,2231	0 2244 1	TC	RMCDINV	
1516	REF	1			25,2232	4 4736 1	CS	REMOOBIT	END OF REMODE.
1517	PEF	55	LAST	534	25,2233	7 0110 0	MASK	RADMODES	
1518	PEF	56	LAST	534	25,2234	54 110 0	TS	RADMODES	
1519	PEF	2	LAST	532	25,2235	3 4742 1	CAF	DESIGRIT	WAS REMODE CALLED DURING DESIGNATE?
1520	PEF	57	LAST	534	25,2236	7 0110 0	MASK	RADMODES	(BIT10 RADMODES = 1)
1521					25,2237	0 0006 1	EXTEND		
1522	PEF	1			25,2240	1 354 1	PZF	RGCCCFND	NO-RETURN TO CALLER WAITING IN RADSTALL
1523	PEF	2	LAST	513	25,2241	0 2613 1	TC	STDESIG	YES - RETURN TO DESIGNATE
1524	REF	2	LAST	283	7743		-45DECSR =	13,14,15	
1525					25,2242	67070 1	-50DECSR DEC	-.27778	
1526					25,2243	61615 1	-80DECSR DEC	-.44444	
1527	REF	58	LAST	534	25,2244	22 110 1	RMCDINV	LXCH	RADMODES
1528	REF	10	LAST	534	25,2245	3 4740 0	CAF	ANTENBIT	INVERT THE MODE STATUS.
1529					25,2246	0 0006 1	EXTEND		
1530	PEF	11	LAST	527	25,2247	06 001 0	RXCR	LCHAN	
1531	PEF	59	LAST	534	25,2250	54 110 0	TS	RADMODES	
1532	PEF	161	LAST	532	25,2251	0 0002 0	TC	Q	

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P1533 PROGRAM NAMES_ RPTONLY, PRSONLY

P1534 FUNCTIONAL DESCRIPTION

P1535 RPTONLY AND PRSONLY ARE SUBROUTINES FOR DOING SINGLE AXIS

P1536 RR MANEUVERS FOR REMOTE AND REPOSITION. IT DRIVES TO

P1537 WITHIN 1 DEGREE. INITIALLY, AT PRIAX2, THE REMOTE AND REPOSITION

P1538 FLAGS (RACMODES BITS 14, 11) ARE CHECKED. IF BOTH EXIST,

P1539 THE PROGRAM EXITS TO REPOSRT (SEE CORREPOS). THIS INDICATES

P1540 THAT SOMEONE POSSIBLY REQUESTED A DESIGNATE (RACMODES BIT 10)

P1541 WHICH REQUIRES A REMOTE (RACMODES BIT 14) AND THAT A

P1542 REPOSITION IS IN PROGRESS (RACMODES BIT 11). IF NONE

P1543 OR ONLY ONE OF THE FLAGS EXIST, REMOTE OR REPOSITION, MAGSLB

P1544 IS CALLED TO SEE IF THE APPROPRIATE ANGLE IS WITHIN 1 DEGREE. IF YES,

P1545 CONTROL RETURNS TO THE CALLING ROUTINE. IF NOT, CONTROL IS

P1546 TRANSFERRED TO ROUT FOR SINGLE AXIS MANEUVERS WITH THE OTHER

P1547 ANGLE SET = 0. FOLLOWING A .5 SECOND WAIT, THE ABOVE PROCEDURE IS

P1548 REPEATED.

P1549 CALLING SEQUENCE: L-1 CAF *ANGLE* (DESIRED ANGLE SCALED PI)

P1550 L TO RPTONLY (TRUNION ONLY)

P1551 PRSONLY (SHAFT ONLY)

P1552 RPTONLY IS CALLED BY PREPOS29;

P1553 RPTONLY AND PRSONLY ARE CALLED BY CORREPOS AND REMOTE

P1554 FRASABLE INITIALIZATION REQUIRED:

P1555 C(A) = DESIRED ANGLE, RACMODES

P1556 SUBROUTINES CALLED_

P1557 FIXDELAY, REPOSRT, MAGSUB, ROUT

P1558 JOBS OR TASKS INITIATED_

P1559 NONE

P1560 ALARMS_ NONE

P1561 EXIT_ REPOSRT (REMOTE AND REPOSITION FLAGS PRESENT - RACMODES

P1562 BITS 14, 11)

P1563 !+1 (ANGLE WITHIN ONE DEGREE OR RR OUT OF AUTO MODE)

1564	REF	2	LAST	106	25,2252	55'313	1	RPTONLY	TS	REFS	DESIRED TRUNION ANGLE.
1565	REF	113	LAST	530	25,2253	3 4755	1		CAF	ZERO	
1566	REF	1			25,2254	1 2257	1		TCF	PRIAXIS	

1567	REF	3	LAST	535	25,2255	55'313	0	PRSONLY	TS	REFS	SHAFT COMMANDS ARE UNRESOLVED SINCE THIS
1568	REF	65	LAST	529	25,2256	3 4753	1		CAF	ONE	ROUTINE ENTERED ONLY WHEN T = 0 OR 180.

1569	REF	1			25,2257	55'314	1	PRIAXIS	TS	REFINDEX	
1570					25,2260	0 0006	1			EXTEND	
1571	REF	4	LAST	530	25,2261	23'312	0		CXCF	RRPRT	
1572	REF	1			25,2262	1 2265	0		TCF	PRIAX2	

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1573	REF	7	LAST	531	25,2263	0 5221 0	NXTRR1AX	TC	FIXDELAY	
1574					25,2264	00062 0		DEC	50	2 SAMPLES PER SFCCND.
1575	REF	60	LAST	534	25,2265	4 0110 0	RR1AX2	CS	RADMODES	IF SOMEONE REQUESTS AS DESIGNATE WHICH
1576	REF	2	LAST	291	25,2266	7 7713 1		MASK	PRIC22	REQUIRES A REMODE AND A REPOSITION IS IN
1577					25,2267	0 0006 1		EXTEND		PROGRESS, INTERRUPT IT AND START THE
1578	REF	1			25,2270	1 2155 0		BZF	REFCSRPT	REMODE IMMEDIATELY.
1579	REF	4	LAST	535	25,2271	3 1313 1		CA	RDES	
1580					25,2272	0 0006 1		EXTEND		
1581	REF	2	LAST	535	25,2273	5 1314 0		INDEX	RRINDEX	
1582	REF	7	LAST	536	25,2274	20 035 0		MSU	CDLT	
1583	REF	9	LAST	525	25,2275	54 061 1		TS	ITEMP1	SAVE ERROR SIGNAL.
1584					25,2276	0 0006 1		EXTEND		
1585	REF	1			25,2277	7 2316 0		MP	RRSPGAIN	TRIPS TO NULL .7 OF ERROR OVER NEXT .5
1586	REF	71	LAST	527	25,2300	54 001 1		TS	L	
1587	REF	61	LAST	536	25,2301	3 0110 1		CA	RADMODES	
1588	REF	4	LAST	188	25,2302	7 4752 1		MASK	AUTOMBIT	
1589	REF	10	LAST	536	25,2303	56 061 0		XCF	ITEMP1	STORE RR-OUT-OF-AUTO-MODE BIT.
1590	REF	6	LAST	530	25,2304	0 4512 0		TC	MAGSLB	SEE IF WITHIN ONE DEGREE.
1591					25,2305	77644 1		DEC	- .00555	SCALED IN HALF-REVS.
1592	REF	11	LAST	536	25,2306	10 061 1		CCS	ITEMP1	NO. IF RR CUT OF AUTO MODE, EXIT.
1593	REF	5	LAST	535	25,2307	0 1212 0		TC	RRSET	RETURN TO CALLER.
1594	REF	3	LAST	536	25,2310	11 314 1		CCS	PRINDEX	COMMAND FOR OTHER AXIS IS ZERO.
1595					25,2311	1 2312 0		TCF	+2	SETTING A TO 0.
1596	REF	72	LAST	536	25,2312	56 001 0		XCF	L	
1597	REF	1			25,2313	53 355 1		DXCF	TRUNCMD	
1598	REF	1			25,2314	0 2317 0		TC	PROUT	
1599	REF	1			25,2315	1 2263 0		TCF	NXTRR1AX	COME BACK IN .5 SECONDS.
1600					25,2316	22715 1	RRSPGAIN	DEC	.59062	NULL .7 ERROR IN .5 SEC.

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R1601 PROGRAM NAME_ RRCUT

RRCR COUNTER SCALING. RRCUT LIMITS THEM

R1603 FUNCTIONAL DESCRIPTION

R1604 RRCUT RECEIVES RP CYCLE COMMANDS IN TANG, TANG +1 IN RR

R1605 ERROR COUNTER SCALING. RRCUT THEN LIMITS THEM AND

R1606 GENERATES COMMANDS TO THE CPU TO ADJUST THE ERROR COUNTERS

R1607 TO THE DESIRED VALUES. INITIALLY MAGSUB CHECKS THE MAGNITUDE OF

R1608 THE COMMAND (SHAFT ON 1ST PASS) TO SEE IF IT IS GREATER THAN

R1609 384 PULSES. IF NOT, CONTROL IS TRANSFERRED TO RRCUTLIM TO

R1610 LIMIT THE COMMAND TO +384 OR -384 PULSES. THE DIFFERENCE IS

R1611 THEN CALCULATED BETWEEN THE DESIRED STATE AND THE PRESENT STATE OF

R1612 THE ERROR COUNTER AS RECORDED IN LASTYCMD AND LASTXCMD.

R1613 THE RESULT IS STORED IN CPTXCMD (1ST PASS) AND CETYCMD (2ND

R1614 PASS). FOLLOWING THE SECOND PASS, FOR THE TRUNNION COMMAND, THE

R1615 OGDUT AND OGDLS ERROR COUNTER DRIVE BITS (CHAN 14 BITS 12, 11)

R1616 ARE SET. THIS PROGRAM THEN EXITS TO THE CALLING PROGRAM.

R1617 CALLING SEQUENCE:

R1618 L TO RRCUT (WITH RUPT INHIBITED) RRCUT IS CALLED BY

R1619 RRCONLY, RRSCONLY, AND DCPES

R1620 FRASABLE INITIALIZATION REQUIRED:

R1621 TANG, TANG +1 (DESIRED COMMANDS), LASTYCMD, LASTXCMD

R1622 (1ST PASS = 0), RP ERROR COUNTER ENABLE SET (CHAN 12 BIT 2).

R1623 SUBROUTINES CALLED_

R1624 MAGSUB

R1625 JOBS OR TASKS INITIATED_

R1626 NONE

R1627 ALARMS_ NONE

R1628 EXIT_ L+1 (ALWAYS)

DESIRED VALUES. RUPT MUST BE INHIBITED.

1630	RFF	162	LAST	534	25,2317	22 002 0	RRCUT	LXCH	Q	
1631	RFF	66	LAST	535	25,2320	3 4753 1		CAF	ONE	
1632	RFF	5	LAST	525	25,2321	54 062 1	RRCUT2	TS	ITEMP2	
1633	RFF	182	LAST	534	25,2322	50 000 1		INDEX	A	
1634	RFF	2	LAST	536	25,2323	3 1354 1		CA	TRUNCMD	
1635	REF	12	LAST	536	25,2324	54 061 1		TS	ITEMP1	

SAVE RETURN.

LOOP TWICE.

SAVE SIGN OF COMMAND FOR LIMITING.

1636	RFF	7	LAST	536	25,2325	1 4512 0		TC	MAGSUB	
1637					25,2326	77177 0	-RRLIMIT	EEC	-384	
1638	REF	1			25,2327	1 2346 0		TCF	RRCUTLIM	

SEE IF WITHIN LIMITS.

LIMIT COMMAND TO MAG OF 384.

1639	RFF	13	LAST	537	25,2331	3 0061 0	SETPRCTR	CA	ITEMP1	
1640	RFF	6	LAST	537	25,2331	50 062 0		INDEX	ITEMP2	
1641	RFF	8	LAST	532	25,2332	56 112 0		XCH	LASTYCMD	
1642					25,2332	4 0000 0		CCM		

COUNT CMT DIFFERENCE BETWEEN DESIRED STATE AND PRESENT STATE AS RECORDED IN LASTYCMD AND LASTXCMD

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1643	REF	14	LAST	527	25,2334	6 0061 0	AD	ITEMP1	
1644	REF	9	LAST	232	25,2335	6 4754 0	AD	NEGO	PREVENT +0 IN COUNTER
1645	REF	7	LAST	527	25,2336	50 062 0	INDEX	ITEMP2	
1646	REF	1			25,2337	54 053 0	TS	CDLTCMD	
1647	REF	8	LAST	538	25,2340	10 062 1	CCS	ITEMP2	PROCESS BOTH INPUTS.
1648	REF	1			25,2341	1 2321 1	TCF	RPCLT2	
1649	REF	1			25,2342	3 5020 0	CAF	PRI06	ENABLE COUNTERS.
1650					25,2343	0 0006 1	EXTEND		
1651	REF	7	LAST	282	25,2344	05 014 1	WOR	CHAN14	PLT ON CCL DRIVES S AND T
1652	REF	73	LAST	536	25,2345	0 0001 0	TC	L	RETURN.
1653	REF	15	LAST	538	25,2346	10 061 1	RRCLTLIM	CCS	ITEMP1
1654	REF	1			25,2347	4 2326 0	CS	-RPLIMIT	LIMIT COMMAND TO ABS VAL OF 384.
1655					25,2350	1 2352 0	TCF	+2	
1656	REF	2	LAST	538	25,2351	3 2326 1	CA	-RRLIMIT	
1657	REF	16	LAST	538	25,2352	54 061 1	TS	ITEMP1	
1658	REF	1			25,2352	1 2331 0	TCF	SETRRCTR +1	

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P1659 ROUTINE TO ZERO THE RR CDS AND DETERMINE THE ANTENNA MODE.

1660	REF	1			25,2354	3 2403 1	RRZERC	CAF	RIT11+1	SEE IF MONITOR REPOSITION OF NCT IN AUTO
1661	REF	62	LAST	536	25,2355	7 0110 0		MASK	RAEMODES	IF SO, CONT RF-ZERO CDS.
1662	REF	183	LAST	537	25,2356	10 000 0		CCS	A	
1663	REF	1			25,2357	1 3513 1		TCF	RADNDOP	(IMMEDIATE TASK TO RGCCEND).

1664					25,2360	0 0004 0		INITIAT		
1665	REF	4	LAST	529	25,2361	4 4737 1		CS	RCDUDBIT	SET FLAG TO SHOW ZEROING IN PROGRESS.
1666	REF	63	LAST	539	25,2362	7 0110 0		MASK	RADMODES	
1667	REF	5	LAST	530	25,2363	6 4737 0		AC	RCDLDBIT	
1668	REF	64	LAST	539	25,2364	54 110 0		TS	RADMODES	

1669	REF	67	LAST	537	25,2365	2 4753 1		CAF	CAS	
1670	REF	20	LAST	492	25,2366	0 5203 0		TC	WAITLIST	
1671	REF	22	LAST	528	25,2367	0 2401 0		FBANK=	LNDCOUNT	
1672	REF	1			25,2367	52067 1		2CACR	RRZ2	

1673	REF	65	LAST	539	25,2371	4 0110 0		CS	RADMODES	SEE IF IN AUTO MODE.
1674	REF	5	LAST	526	25,2372	7 4752 4		MASK	ALTDDBIT	
1675	REF	184	LAST	539	25,2373	10 000 0		CCS	A	
1676	REF	1			25,2374	1 2377 1		TCF	PCADBACK	
1677	REF	22	LAST	493	25,2375	0 5567 0		TC	ALARM	AUTO DISCRETE NCT PRESENT - TRYING
1678					25,2376	0051 0		OCT	510	
1679					25,2377	0 0003 1	RCADBACK	RELINT		
1680	REF	3	LAST	329	25,2400	1 4631 0		TCF	SWRLTUPA	

1681	REF	2	LAST	528	25,2401	0 2172 0	PRZ2	TC	RRZERCSB	COMMON TO TURNON AND RRZERC.
1682	REF	1			25,2402	1 2521 1		TCF	ENDRADAR	

1683					25,2403	02001 1	BIT11+1	OCT	02001	
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P1684 PROGRAM NAME_ RPDSSM

R (HALF-UNIT) IN RTARGET. REMODES IF

R1684 FUNCTIONAL DESCRIPTION_

R1687 THIS INTERPRETIVE ROUTINE WILL DESIGNATE, IF DESIRED ANGLES ARE
 R1688 WITHIN THE LIMITS OF EITHER MODE, TO A LINE-OF-SIGHT (LOS) VECTOR
 R1689 (HALF-UNIT) KNOWN WITH RESPECT TO THE STABLE MEMBER PRESENT
 R1690 ORIENTATION. INITIALLY THE IML CDS'S ARE READ AND CONTROL
 R1691 TRANSFERRED TO SMNB TO TRANSFORM THE LOS VECTOR FROM STABLE
 R1692 MEMBER TO NAVIGATION BASE COORDINATES (SEE STG MEMO 5699)
 R1693 RPANGLES IS THEN CALLED TO CALCULATE THE RP GIMBAL ANGLES,
 R1694 TRUNNICK AND SHAFT, FOR BOTH THE PRESENT AND ALTERNATE MODE.
 R1695 RRLIMCHK IS CALLED TO SEE IF THE ANGLES CALCULATED FOR THE
 R1696 PRESENT MODE ARE WITHIN LIMITS. IF WITHIN LIMITS, THE RETURN
 R1697 LOCATION IS INCREMENTED, INASMUCH AS NO VEHICLE MANEUVER IS
 R1698 REQUIRED, BEFORE EXITING TO STARTDES. IF NOT WITHIN LIMITS OF THE
 R1699 CURRENT MODE, TRYSW IS CALLED. FOLLOWING INVERTING OF THE RP
 R1700 ANTENNA MODE FLAG (RADMCFES BIT 12), RRLIMCHK IS CALLED
 R1701 TO SEE IF THE ANGLES CALCULATED FOR THE ALTERNATE MODE ARE WITHIN
 R1702 LIMITS. IF YES, THE RP ANTENNA MODE FLAG IS AGAIN INVERTED,
 R1703 THE REMODE FLAG (RADMCFES BIT 14) SET, AND THE RETURN LOCATION
 R1704 INCREMENTED, TO INDICATE NO VEHICLE MANEUVER IS REQUIRED, BEFORE
 R1705 EXITING TO STARTDES. IF THESE ANGLES ARE NOT WITHIN LIMITS
 R1706 OF THE ALTERNATE MODE, THE RP ANTENNA MODE FLAG (RADMCFES
 R1707 BIT 12) IS INVERTED BEFORE RETURNING DIRECTLY TO THE CALLING PROGRAM
 R1708 TO INDICATE THAT A VEHICLE MANEUVER IS REQUIRED.

R1709 CALLING SEQUENCE:

R1710 L STCALL RTARGET (LOS HALF-UNIT VECTOR IN SN COORDINATES)
 R1711 L+1 RPDSSM
 R1712 L+2 BASIC (VEHICLE MANEUVER REQUIRED)
 R1713 L+3 BASIC (NO VEHICLE MANEUVER REQUIRED)

R1714 ERASABLE INITIALIZATION REQUIRED:

R1715 RTARGET, RADMCFES

R1716 SUBROUTINES CALLED_

R1717 READCDS, SMNB, RPANGLES, RRLIMCHK, TRYSW (ACTUALLY
 R1718 PART OF), RMODINV

R1719 JOBS OR TASKS INITIATED_

R1720 NONE

R1721 ALARMS_ NONE

R1722 EXIT_ L+2 (NEITHER SET OF ANGLES ARE WITHIN LIMITS OF RELATED MODE)

R1723 STARTDES (DESIGNATE POSSELE AT PRESENT VEHICLE ATTITUDE-RETURNS
 R1724 TO L+2 FROM STARTDES)

CAN BE DONE IN PRESENT VEH ATTITUDE.

1726 25,2404 43020 I RPDSSM STQ CLEAR
 1727 REF 4 LAST 271 25,2405 01112 1 DESRET

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1728	REF	1		25,2406	00271 0		RRNBSW	
1729				25,2407	77624 1	CALL		COMPUTES SINES AND COSINES, ORDER Y Z X
1730	REF	2	LAST 489	25,2410	47541 1		CDLTPIG	
1731				25,2411	45175 0	VLOAD	CALL	LOAD VECTOR AND CALL TRANSFORMATION
1732	REF	4	LAST 520	25,2412	01101 0		PRTARGET	
1733	REF	2	LAST 489	25,2413	47573 0		*SMAB*	
1734				25,2414	77624 1	CALL		GET RR GIMBAL ANGLES IN PRESENT AND
1735	REF	1		25,2415	26133 1		BRANGLES	ALTERNATE MODE.
1736				25,2416	77776 1	EXIT		
1737				25,2417	10004 0	ININT		
1738	REF	3	LAST 515	25,2420	04523 1	TC	REFLIMCHK	
1739	REF	4	LAST 324	25,2421	01106 1	ADRES	MODEA	CONFIGURATION FOR CURRENT MODE.
1740				25,2422	02425 0	TC	+3	ACT IN CURRENT MODE
1741	REF	5	LAST 540	25,2423	25112 1	OKDESSM	INCR	INCREMENT SAYS NO VEHICLE MANEUVER REQ.
1742	REF	1		25,2424	02443 0	TC	STARTDES	SHOW DESIGNATE REQUIRED
1743	REF	6	LAST 505	25,2425	40104 0	CS	FLAGWRD8	
1744	REF	5	LAST 509	25,2426	74744 0	MASK	SURFFBIT	CHECK IF ON LUNAR SURFACE (SLRFFLAG=P22F)
1745				25,2427	00006 1	EXTEND		
1746	REF	1		25,2430	12467 1	BZF	NCRDSTAL	BRANCH-YES-CANNOT DESIGNATE IN MODE 2
1747	REF	1		25,2431	02472 1	TC	TRYSWS	
1748	REF	7	LAST 541	25,2432	40104 0	LLADESCH	CS	OVERFLOW RETURN FROM BRANGLES
1749	REF	6	LAST 541	25,2433	74744 0		MASK	CHECK IF ON LUNAR SURFACE
1750				25,2434	00006 1		EXTEND	
1751	REF	2	LAST 541	25,2435	12467 1	BZF	NCRDSTAL	BRANCH-YES-RETURN TO CALLER - ALARM 527
1752	REF	37	LAST 522	25,2436	30074 1	CA	STATE	
1753	REF	7	LAST 506	25,2437	74745 1	MASK	RNDVZEIT	
1754	REF	185	LAST 539	25,2440	10000 0	CCS	A	TEST RNDVZELC.
1755	REF	1		25,2441	02502 1	TC	NCRDESSM	NOT ON MCON-CALL FOR ATTITUDE MANEUVER
1756	REF	89	LAST 522	25,2442	15155 1	TCF	ENDCFJCE	...BUT ACT IN R29.

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P1757 PROGRAM NAME_ STARTCES STORED AS A HALF-UNIT VECTOR IN RRTARGET

P1759 FUNCTIONAL DESCRIPTION_ CKCN IS DESIRED. BIT14 OF RADMCDES IS

R1761 STARTCES IS ENTERED WHEN WE ARE READY TO BEGIN DESIGNATION.

R1763 BIT 14 OF RADMCDES IS ALREADY SET IF A REMODE IS REQUIRED.

R1765 AT THIS TIME, THE RR ANTENNA MAY BE IN A REPOSITION

R1767 OPERATION. IN THIS CASE, IF A REMODE IS REQUIRED IT MAY HAVE

R1768 ALREADY BEGUN BUT IN ANY CASE THE REPOSITION WILL BE INTERRUPTED.

R1769 OTHERWISE, THE REPOSITION WILL BE COMPLETED BEFORE 2-AXIS

R1770 DESIGNATION BEGINS. INITIALLY DESOCLAT IS SET = 60 TO INDICATE

R1771 THAT 30 SECONDS WILL BE ALLOWED FOR THE RR DATA GOOD INBIT

R1772 (CHAN 33 BIT 4) IF LOCK-ON IS DESIRED (STATE BIT 5). BIT 10

R1773 OF RADMCDES IS SET TO SHOW THAT A DESIGNATE IS REQUIRED.

R1774 THE REPOSITION FLAG (RADMCDES BIT 11) IS CHECKED. IF SET,

R1775 THE PROGRAM EXITS TO L+3 OF THE CALLING PROGRAM (SEE PROCESM

R1776 AND PROCESNB). THE PROGRAM WILL BEGIN DESIGNATING TO THE DESIRED

R1777 ANGLES FOLLOWING THE REPOSITION OR REMODE IF ONE WAS

R1778 REQUESTED. IF THE REPOSITION FLAG IS NOT SET, SETPREC IS CALLED

R1779 WHICH SETS THE RR ERROR COUNTER ENABLE BIT (CHAN 12 BIT 2)

R1780 AND SETS LASTXCMC AND LASTYCMC = 1 TO INDICATE THE

P1781 DIFFERENCE BETWEEN THE PRESENT AND DESIRED STATE OF THE ERROR

R1782 COUNTERS. A 20 MILLISECOND WAITLIST CALL IS SET FOR BEGDES

R1783 AFTER WHICH THE PROGRAM EXITS TO L+3 OF THE CALLING PROGRAM.

R1784 CALLING SEQUENCE:

R1785 FROM PROCESM AND PROCESNB WHEN ANGLES WITHIN LIMITS.

R1786 ERASABLE INITIALIZATION REQUIRED:

R1787 RADMCDES, (SEE PROCES)

R1788 SUBROUTINES CALLED_

P1789 SETPREC, WAITLIST

R1790 JCPS OR TASKS INITIATED_

R1791 BEGDES

R1792 ALARMS_ NONE

R1793 EXIT_ L+3 OF CALLING PROGRAM (SEE PROCESM)

R1794 L+2 OF CALLING PROGRAM (SEE PROCESNB)

1795 RFF 6 LAST 541 25,2443 25,112 1 STARTCES INCR DESSET

1796 RFF 66 LAST 539 25,2444 4,110 0 CS RADMCDES

1797 RFF 3 LAST 534 25,2445 7,4742 0 MASK DESIGBIT

1798 RFF 67 LAST 542 25,2446 26,110 0 ADS RADMCDES

1799 RFF 3 LAST 532 25,2447 7,4741 0 MASK REPOSBIT

1800 RFF 186 LAST 541 25,2450 10,00 0 CCS A

1801 RFF 1 25,2451 1,2457 1 TCF DESRETRN

SEE IF REPOSITIONING IN PROGRESS.

ECTR ALREADY SET UP.

1802 RFF 2 LAST 531 25,2452 0,2167 0 TC SETPREC

SET UP ERROR COUNTERS.

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1803 REF 36 LAST 509 25,2453 3 4752 0
 1804 REF 21 LAST 530 25,2454 0 5203 0
 1805 REF 23 LAST 539 27,1456
 1806 REF 2 LAST 532 25,2455 02604 1
 1806 25,2456 52067 1

CAF TWO
 TC WAITLIST
 BEANK= LSCCLNT
 2CACR BECCES

1807 REF 3 LAST 518 25,2457 3 1313 0
 1808 25,2460 0 0006 1
 1809 REF 1 25,2461 1 2463 0
 1810 REF 90 LAST 541 25,2462 0 5155 0
 1811 25,2463 0 0003 1
 1812 REF 7 LAST 542 25,2464 25,1112 1
 1813 REF 8 LAST 543 25,2465 3 1112 1
 1814 REF 9 LAST 522 25,2466 1 4640 0

DESRTRN CA RADCAER
 EXTEND
 BZF DESRTEN
 TC ENDOFJOB
 DESRTN PELINT
 INCR DESRET
 CA DESRET
 TCF BANKJLME

FIRST PASS THRU DESIGNATE

YES SET EXIT

NO

1815 REF 114 LAST 535 25,2467 3 4755 1
 1816 REF 4 LAST 542 25,2470 55,303 1
 1817 REF 2 LAST 542 25,2471 1 2463 0

NORSTAL CAF
 TS
 TCF

ZERO
 RADCAER
 DESRTN

ZERO RADCAER TO WIPE OUT ANYONE

WAITING IN RADSTALL SINCE WE ARE NOW

RETURNING TO P20 AND MAY DO NEW RADSTALL

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P1818 SEE IF RPROCESSM CAN BE ACCOMPLISHED AFTER A REMODE.

1819	REF	2	LAST	534	25,2472	0 2244 1	TRYSWS	TC	RMCDINV	(NOTE RUP INHIBIT)
1820	REF	4	LAST	541	25,2472	0 4523 1		TC	RRLINCHK	TRY DIFFERENT MODE.
1821	REF	4	LAST	324	25,2474	01111 0		ACRES	MCDER	
1822	REF	2	LAST	541	25,2475	1 2502 0		TCF	NCDSSM	VEHICLE MANEUVER REQUIRED.
1823	REF	3	LAST	544	25,2476	0 2244 1		TC	RMCDINV	RESET BIT12
1824	REF	2	LAST	534	25,2477	3 4736 1		CAF	REMODBIT	SET FLAG FOR REMODE.
1825	REF	6P	LAST	542	25,2500	26 110 0		ADS	PACNCCES	
1826	REF	1			25,2501	1 2423 1		TCF	CKDESSM	
1827	REF	4	LAST	544	25,2502	0 2244 1	NCDSSM	TC	RMCDINV	RE-INVERT MCODE AND RETURN
1828	REF	9	LAST	543	25,2503	25 1112 1		INCR	DESRET	TO CALLER +2
1829	REF	3	LAST	541	25,2504	1 2467 1		TCF	NOPDSTAL	
1830					25,2505	00074 1	MAXTRYS	DEC	60	

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P1831 DESIGNATE TO SPECIFIC KR GIMBAL ANGLES (INDEPENDENT OF VEHICLE MOTION). ENTER WITH DESIRED ANGLES IN
 R1833 TANG AND TANG +1.

1834 REF 6 LAST 519 25,2506 0 4645 1 RDCESNB TC MAKECADR
 1835 REF 10 LAST 544 25,2507 55 1112 0 TS DESRET

1836 REF 57 LAST 521 25,2510 0 5516 0 TC DOWNFLAG RESET FLAG TO PREVENT DCFES FROM COINC
 1837 REF 6 LAST 517 25,2511 0 0041 1 ADRES LOSCMFLG BACK TO F21
 1838 REF 1 25,2512 3 25 5 0 CA MAXTPYS SET TIME LIMIT COUNTER
 1839 REF 2 LAST 511 25,2513 55 1113 1 TS DESSCNT FOR DESIGNATE
 1840 25,2514 0 0004 0 INHINT SEE IF CURRENT MODE OK.
 1841 REF 1 25,2515 0 2551 1 TC PRLIMNB DC SPECIAL V41 LIMIT CHECK
 1842 REF 8 LAST 510 25,2516 0 1106 1 ADRES TANG
 1843 REF 1 25,2517 1 2524 0 TCF TPYSWA SEE IF IN OTHER MODE.

1844 25,2520 0 0003 1 OKCESNB RFLINT
 1845 25,2521 0 0006 1 EXTEND
 1846 REF 9 LAST 545 25,2522 3 1107 0 DCA TANG
 1847 REF 6 LAST 525 25,2523 53 753 0 EXCH TANGAB
 1848 REF 45 LAST 520 25,2524 0 6042 1 TC INTERPRET

1849 25,2525 77624 1 CALL GET LCS IN NB CCCRDS.
 1850 REF 1 25,2526 46041 0 RRNR
 1851 REF 5 LAST 541 25,2527 0 1101 0 STORE RRTARGET

1852 25,2530 77414 0 SET EXIT
 1853 REF 2 LAST 541 25,2531 0 0071 1 RFBNSW

1854 25,2532 0 0004 0 INHINT
 1855 REF 2 LAST 541 25,2533 1 2444 0 TCF STARTDES +1
 1856 REF 5 LAST 544 25,2534 0 2244 1 TPYSWA TC RMCDIIV SEE IF OTHER MODE WILL DO.
 1857 REF 2 LAST 545 25,2535 0 2551 1 TC PRLIMNB DC SPECIAL V41 LIMIT CHECK
 1858 REF 10 LAST 545 25,2536 0 1106 1 ADRES TANG
 1859 REF 1 25,2537 1 2544 1 TCF NCDESAB NOT POSSIBLE.

1860 REF 6 LAST 545 25,2540 0 2244 1 TC RMCDIIV
 1861 REF 2 LAST 544 25,2541 2 4736 1 CAF REMODEIT CALL FOR REMODE.
 1862 REF 69 LAST 544 25,2542 26 110 0 ADS RADMCDES
 1863 REF 1 25,2543 1 2520 0 TCF OKDESAB

1864 REF 7 LAST 545 25,2544 0 2244 1 NCDESNB TC RMCDIIV REINVERT MODE BIT.
 1865 REF 23 LAST 539 25,2545 0 5567 0 TC ALARM BAC INPUT ANGLES.
 1866 25,2546 0 0502 0 CCT 502
 1867 REF 9 LAST 518 25,2547 0 6011 1 TC CLRADMODE
 1868 REF 91 LAST 543 25,2550 0 5155 0 TC ENDOFJOB AVOID 503 ALARM.

1869 REF 163 LAST 537 25,2551 50 002 0 PRLIMNB INDEX 0 THIS ROUTINE IS IDENTICAL TO PRLIMNB
 1870 25,2552 2 2000 1 CAF 0 EXCEPT THAT THE MODE 1 SHFT LOWER
 1871 REF 164 LAST 545 25,2553 24 002 0 INCR 0 LIMIT IS -85 INSTEAD OF -70 DEGREES
 1872 25,2554 0 0006 1 EXTEND

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1873	REF	187	LAST	542	25,2555	5 0000 1	INDEX	A	READ CIMPAL ANGLES INTO ITEMP STORAGE
1874					25,2556	3 0001 0	CCA	0	
1875	REF	17	LAST	538	25,2557	52 062 1	EXCH	ITEMP1	
1876	PEF	165	LAST	545	25,2560	22 002 0	EXCH	G	L(CALLER +2) TO L
1877	PEF	11	LAST	534	25,2561	3 4740 0	CAF	ANTENBIT	SEE WHICH MODE RR IS IN.
1878	REF	70	LAST	545	25,2562	7 0110 0	MASK	RADMCCFS	
1879	REF	188	LAST	546	25,2563	10 000 0	CCS	A	
1880	REF	2	LAST	524	25,2564	1 4550 1	TCF	MODE2CHK	MODE 2 CAN USE RRLIMCHK CODING
1881	REF	18	LAST	546	25,2565	3 0061 0	CA	ITEMP1	
1882	REF	8	LAST	537	25,2566	0 4512 0	TC	MAGSUB	MODE 1 IS DEFINED AS
1883					25,2567	66161 1	DEC	-.30555	1. ABS(T) L 55 DEGS
1884	REF	74	LAST	538	25,2570	0 0001 0	TC	L	2 SHAFT LIMITS AT +59, -85 DEGS
1885	PEF	9	LAST	538	25,2571	3 0062 0	CA	ITEMP2	LCAD SHAFT ANGLE
1886					25,2572	0 0006 1	EXTEND		
1887	PEF	1			25,2573	6 2601 1	BZMF	NEGSHAFT	IF NEGATIVE SHAFT ANGLE, ADD 20.5 DEGS
1888	REF	2	LAST	525	25,2574	6 4562 1	AD	5.5DEGS	
1889	REF	9	LAST	546	25,2575	0 4512 0	SHAFTLIM	TC	MAGSUB
1890					25,2576	64420 0	DEC	-.35833	64.5 DEGREES
1891	REF	75	LAST	546	25,2577	0 0001 0	TC	L	NOT IN LIMITS
1892	REF	2	LAST	525	25,2600	0 4560 0	TC	RRLIMCK	IN LIMITS
1893	PEF	1			25,2601	6 2603 0	NEGSHAFT	AD	20.5DEGS
1894	PEF	1			25,2602	1 2575 0	TCF	SHAFTLIM	MAKE NEGATIVE SHAFT LIMIT -85 DEGREES
1895					25,2603	03512 1	20.5DEGS	DEC	.11389

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R1896 PROGRAM NAME_ BEGDES

R1897 FUNCTIONAL DESCRIPTION

R1898 BEGDES CHECKS VARIOUS DESIGNATE REQUESTS AND REQUESTS THE
 R1899 ACTUAL RR DESIGNATION. INITIALLY A CHECK IS MADE TO SEE IF A
 R1900 REMODE (RADMODES BIT 14) IS REQUESTED OR IN PROGRESS. IF SO,
 R1901 CONTROL IS TRANSFERRED TO STDESIC AFTER ROUTINE REMODE IS
 R1902 EXECUTED. IF NO REMODE, STDESIC IS IMMEDIATELY CALLED WHERE
 R1903 FIRST THE REPOSITION FLAG (RADMODES BIT 11) IS CHECKED. IF
 R1904 PRESENT, THE DESIGNATE FLAG (RADMODES BIT 10) IS REMOVED
 R1905 AFTER WHICH THE PROGRAM EXITS TO R03ADEND. IF THE REPOSITION
 R1906 FLAG IS NOT PRESENT, THE CONTINUOUS DESIGNATE FLAG (RADMODES
 R1907 BIT 15) IS CHECKED. IF PRESENT, AN EXECUTIVE CALL IS IMMEDIATELY
 R1908 MADE FOR CODES AFTER WHICH A .5 SECOND WAIT IS INITIATED BEFORE
 R1909 REPEATING AT STDESIC. IF THE RR SEARCH ROUTINE (LRS24.1) IS DESIGNATING
 R1910 TO A NEW POINT (NEWPTLOC SET) THE CURRENT DESIGNATE TASK IS TERMINATED.
 R1911 IF CONTINUOUS DESIGNATE IS NOT WANTED, THE DESIGNATE FLAG (RADMODES
 R1912 BIT 10) IS CHECKED. IF NOT PRESENT, THE PROGRAM EXITS TO ENDRADAR TO
 R1913 CHECK RR CDU FAIL BEFORE RETURNING TO THE CALLING PROGRAM. IF DESIGNATE
 R1914 IS STILL REQUIRED, DESCOUNT IS CHECKED TO SEE IF THE 20 SECONDS HAS
 R1915 EXPIRED BEFORE RECEIVING THE RR DATA GOOD (CHAN 33 BIT 4)
 R1916 SIGNAL. IF OUT OF TIME, PROGRAM ALARM 00503 IS REQUESTED, THE
 R1917 RR AUTO TRACKER ENABLE AND RR ERROR COUNTER ENABLE
 R1918 (CHAN 12 BITS 14,2) BITS REMOVED, AND THE DESIGNATE FLAG
 R1919 (RADMODES BIT 10) REMOVED BEFORE EXITING TO R03ADEND. IF
 R1920 TIME HAS NOT EXPIRED, DESCOUNT IS DECREMENTED, THE
 R1921 EXECUTIVE CALL MADE FOR CODES, AND A .5 SECOND WAIT INITIATED
 R1922 BEFORE REPEATING THIS PROCEDURE AT STDESIC.

P1923 CALLING SEQUENCE:

R1924 WAITLIST CALL FROM STARTERS
 R1925 TO BEGDES FROM R03RPOS
 R1926 TO STDESIC RETURNING, FROM REMODE

R1927 ERASABLE INITIALIZATION REQUIRED:
 R1928 DESCOUNT, RADMODES

R1929 SUBROUTINES CALLED_
 R1930 ENDRADAR, FINDVAC

P1931 JOBS OR TASKS INITIATED_ CODES

R1932 ALARMS_ PROGRAM ALARM 00503 (30 SECONDS HAVE EXPIRED) WITH NO RR DATA
 R1933 GOOD (CHAN 33 BIT 4) RECEIVED WHEN LOCK-CN (STATE BIT 5) WAS REQUESTED.

R1934 EXIT_ TASKOVER (SEARCH PATTERN DESIGNATING TO NEW POINT)
 R1935 ENDRADAR (NO DESIGNATE - RADMODES BIT 10)
 R1936 R03ADEND (REPOSITION CP 20 SECONDS EXPIRED)

1937 REF 71 LAST 546 25,2674 4 C110 0 BECODES CS RADMODES

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1938	REF	4	LAST	545	25,2605	7 4736 0		MASK	REMCDBIT	
1939	REF	189	LAST	546	25,2616	10 130 0		CCS	A	
1940	REF	3	LAST	534	25,2617	0 2613 1		TC	STDESIC	
1941	REF	1			25,2611	0 2712 0		TC	REMCDE	
1942	REF	8	LAST	536	25,2611	0 5221 0	DESLOOP	TC	FIXDELAY	2 SAMPLES PER SECOND.
1943					25,2612	0 0062 0		DFC	50	
1944	REF	4	LAST	542	25,2613	2 4741 1	STDESIC	CAF	REPCSHIT	
1945	REF	72	LAST	547	25,2614	7 0111 0		MASK	RADMODES	SEE IF GIMBAL LIMIT MONITOR HAS FOUND US
1946	REF	191	LAST	548	25,2615	10 000 0		CCS	A	CUT OF ECUNCS. IF SC, THIS BIT SHOWS A
1947	REF	1			25,2616	1 2634 0		TCF	BADDES	REPOSITION TO BE IN PROGRESS.
1948	REF	72	LAST	548	25,2617	10 110 0		CCS	RADMODES	SEE IF CONTINUOUS DESIGNATE WANTED.
1949					25,2620	1 2623 0		TCF	+3	IF SC, CONT CHECK BIT 10 TO SEE IF IN
1950					25,2621	1 2623 0		TCF	+2	LIMITS BUT GO RIGHT TO FINDVAC ENTRY.
1951	REF	1			25,2622	1 2640 0		TCF	MCPEDES +1	
1952	REF	74	LAST	546	25,2623	4 0110 0		CS	RADMODES	IF NON-CONTINUOUS, SEE IF END OF
1953	REF	4	LAST	542	25,2624	7 4742 0		MASK	DESIGBIT	PROBLEM (DATA GOOD IF LOCK-CN WANTED CR
1954	REF	191	LAST	548	25,2625	10 000 0		CCS	A	WITHIN LIMITS IF NOT). IF SC, EXIT AFTER
1955	REF	2	LAST	535	25,2626	1 3531 1		TCF	ENRADAR	CHECKING RR CCU FAIL.
1956	REF	2	LAST	545	25,2627	11 113 1	STDESIC1	CCS	DESCCOUNT	SEE IF THE TIME LIMIT HAS EXPIRED
1957	REF	2	LAST	548	25,2630	1 2627 0		TCF	MCPEDES	
1958	REF	1			25,2631	4 2645 0		CS	B14+B2	IF OUT OF TIME, REMOVE ECR ENABLE + TRKR
1959					25,2632	0 0006 1		EXTEND		
1960	REF	33	LAST	532	25,2632	03 012 1		WAND	CHAN12	
1961	REF	58	LAST	545	25,2634	0 5516 0	BADDES	TC	DOWNFLAG	
1962	REF	1			25,2635	0 0271 0		ADRES	DESIGFLG	
1964	REF	1			25,2636	1 3545 1		TCF	RCBADEND	
1965	REF	4	LAST	548	25,2637	55 113 1	MCPEDES	TS	DESCCOUNT	
1966	REF	9	LAST	521	25,2640	2 7717 1		CAF	PRIO26	UPDATE CYRC TORQUE COMMANDS.
1967	REF	22	LAST	521	25,2641	0 5105 0		TC	FINDVAC	
1968	REF	24	LAST	542	E7,1456			EBANK=	LCSCOUNT	
1969	REF	1			25,2642	02646 1		2CADR	DCDES	
1969	REF	1			25,2643	52067 1				
1970	REF	1			25,2644	1 2611 1		TCF	DESLOOP	
1971					25,2645	20002 1	B14+B2	CCT	20002	

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P1972 PROGRAM NAME_ BGDDES

R1973 FUNCTIONAL DESCRIPTION_

R1974 BGDDES CALCULATES AND REQUESTS ISSUANCE OF RR BYRC TORCLE

R1975 COMMANDS. INITIALLY THE CURRENT PR CUJ ANGLES ARE STORED AND

R1976 THE LOS HALF-UNIT VECTOR TRANSFORMED FROM STABLE MEMBER TO

R1977 NAVIGATION BASE COORDINATES VIA SMNB IF NECESSARY. THE

R1978 SHAFT AND TRUNNION COMMANDS ARE THEN CALCULATED AS FOLLOWS_

R1979 + SHAFT = LOS * (COS(S), 0, -SIN(S)) (DOT PRODUCT)

R1980 -TRUNNION = LOS * (SIN(T) SIN(S), COS(T), SIN(T) COS(S))

R1981 THE SIGN OF THE SHAFT COMMAND IS THEN REVERSED IF IN MODE 2

R1982 (RADMODES BIT 12) BECAUSE A RELAY IN THE PR REVERSES THE

R1983 POLARITY OF THE COMMAND. AT PRSCALUP EACH COMMAND IS

R1984 SCALED AND IF EITHER, OR BOTH, OF THE COMMANDS IS GREATER THAN

R1985 .5 DEGREES, MPAC +1 IS SET POSITIVE. IF A CONTINUOUS DESIGNATE

R1986 (RADMODES BIT 15) IS DESIRED AND THE SEARCH ROUTINE IS NOT OPERATING,

R1987 THE PR AUTO TRACKER ENABLE BIT (CHAN 12 BIT 14) IS CLEARED AND RROUT

R1988 CALLED TO PUT OUT THE COMMANDS PROVIDED NO REPOSITION (RADMODES BIT 11)

R1989 IS IN PROGRESS. IF A CONTINUOUS DESIGNATE AND THE SEARCH ROUTINE IS

R1990 OPERATING (SPCHOPT FLAG SET) THE TRACK ENABLE IS NOT CLEARED. IF NO

R1991 CONTINUOUS DESIGNATE AND BOTH COMMANDS ARE NOT LESS THAN .5 DEGREES AS

R1992 INDICATED BY MPAC +1, THE PR AUTO TRACKER ENABLE BIT (CHAN 12 BIT 14) IS

R1993 CLEARED AND RROUT CALLED TO PUT OUT THE COMMANDS PROVIDED NO REPOSITION

R1994 (RADMODES BIT 11) IS IN PROGRESS. IF BOTH COMMANDS ARE LESS THAN .5

R1995 DEGREES AS INDICATED BY MPAC +1, THE PR AUTO TRACKER ENABLE BIT

R1996 (CHAN 12 BIT 14) IS CLEARED AND RROUT CALLED TO PUT OUT THE

R1997 COMMANDS PROVIDED NO REPOSITION (RADMODES BIT 11) IS IN

R1998 PROGRESS. IF BOTH COMMANDS ARE LESS THAN .5 DEGREES, THE

R1999 LOCK-ON FLAG (STATE BIT 5) IS CHECKED. IF NOT PRESENT, THE

R2000 DESIGNATE FLAG (RADMODES BIT 10) IS CLEARED, THE PR ERROR

R2001 COUNTER ENABLE BIT (CHAN 12 BIT 2) IS CLEARED, AND ENDCFJOB

R2002 CALLED. IF LOCK-ON IS DESIRED, THE PR AUTO TRACKER (CHAN 12

R2003 BIT 14) IS ENABLED FOLLOWED BY A CHECK OF THE RECEIPT OF THE

R2004 PR DATA GOOD (CHAN 32 BIT 4) SIGNAL. IF PR DATA GOOD

R2005 PRESENT, THE DESIGNATE FLAG (RADMODES BIT 10) IS CLEARED,

R2006 THE PR ERROR COUNTER ENABLE BIT (CHAN 12 BIT 2) IS CLEARED,

R2007 AND ENDCFJOB CALLED. IF PR DATA GOOD IS NOT PRESENT, RROUT

R2008 IS CALLED TO PUT OUT THE COMMANDS PROVIDED NO REPOSITION

R2009 (RADMODES BIT 11) IS IN PROGRESS AFTER WHICH THE JOB IS TERMINATED

R2010 VIA ENDCFJOB.

R2011 CALLING SEQUENCE:

R2012 EXECUTIVE CALL EVERY .5 SECONDS FROM BGDDES.

R2013 FRASABLE INITIALIZATION REQUIRED:

R2014 RETARGET (HALF-UNIT LOS VECTOR IN EITHER SM OR NE COORDINATES),

R2015 LOCKONSW (STATE BIT 5), REARSW (STATE BIT 6), RADMODES

R2016 SUBROUTINES CALLED_

R2017 PRADMODES, SMNB, CRULEGIC, MAGSUB, RROUT

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R2018 JOBS OR TASKS INITIATED_
R2019 NONE

P2020 ALARMS_ NONE

R2021 EXIT_ ENDOFJOB (ALWAYS)

2022					25,2646	0 0006 1	CCCS	EXTEND		
2023	REF	8	LAST	536	25,2647	3 0036 1		CCA	CPUT	
2024	REF	11	LAST	545	25,2650	53 007 1		EXCH	TANG	
2025	REF	46	LAST	545	25,2651	0 6042 1		TC	INTPRET	
2026					25,2652	77201 1		SFTPD	VLCAD	
2027					25,2653	00001 0				
2028	REF	6	LAST	545	25,2654	01101 0			RRTARGET	
2029					25,2655	74214 0	BCN		VXSC	
2030	REF	3	LAST	545	25,2656	00311 1			RRNBSW	
2031	REF	1			25,2657	52671 0			DCNPRC	TARGET IN NAV-BASE COORDINATES
2032	REF	1			25,2660	01767 0			MLCSV	MULTIPLY UNIT LCS BY MAGNITUDE
2033					25,2661	63372 1	VSL1		PDVL	
2034	REF	2	LAST	113	25,2662	01761 0			LCSVEL	
2035					25,2663	53361 0	VXSC		VAD	ADD ONE SECOND RELATIVE VELOCITY TO LCS
2036	REF	1			25,2664	13101 0			MCTCMS	
2037					25,2665	45056 0	UNIT		CALL	
2038	REF	3	LAST	541	25,2666	47541 1			COLTRIG	
2039					25,2667	77624 1	CALL			
2040	REF	3	LAST	541	25,2670	47673 0			*SMNB*	
2041					25,2671	14041 1	CONCRE	STOCL	32D	
2042	REF	12	LAST	550	25,2672	01110 0			TANG +1	
2043					25,2673	41434 1	RTB		PUSH	SHAFT COMMAND = V(32D).(CCS(S), 0,
2044	REF	11	LAST	375	25,2674	21577 1			COLLOGIC	(-SIN(S)).
2045					25,2675	65356 1	SIN	PDCL		SIN(S) TO 0 AND CCS(S) TO 2.
2046					25,2676	41546 0	COS	PUSH		
2047					25,2677	65205 0	CNF	PDCL		
2048					25,2700	00041 1			32D	
2049					25,2701	00045 0			36D	
2050					25,2702	44205 0	CNF		BESU	
2051					25,2703	00001 0			0	
2052					25,2704	77525 0	STADR			
2053	REF	13	LAST	550	25,2705	76667 1	STORE	TANG +1		SHAFT COMMAND
2054					25,2706	47135 0	SLOCAD	RTB		
2055	REF	14	LAST	550	25,2707	01107 0			TANG	
2056	REF	12	LAST	550	25,2710	21577 1			COLLOGIC	
2057					25,2711	71406 0	PUSH	COS		COS(T) TO 4.
2058					25,2712	73525 1	PDCL	SIN		
2059					25,2713	41206 0	PUSH	DMP		SIN(T) TO 6.
2060					25,2714	00003 1			2	

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2061	25,2715	65352 0	SL1	PDDL	DEFINE VECTOR L = (SIN(T)SIN(S))
2062	25,2716	60705 1		4	(COS(T))
2063	25,2717	41225 0	PDDL	DMF	(SIN(T)COS(S))
2064	25,2720	00207 0		6	
2065	25,2721	00101 0		1	
2066	25,2722	55552 0	SL1	VDEF	
2067	25,2723	77441 0	DOT	EXIT	DOT U WITH LCS TO GET TRANSMISSION COMMAND.
2068	25,2724	00041 1		320	

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P2069 - AT THIS POINT WE HAVE A ROTATION VECTOR IN CISE AXES LYING IN THE TS PLANE. CONVERT THIS TO A
 P2071 COMMAND RATE AND ENABLE THE TRACKER IF WE ARE WITHIN .5 DEGREES OF THE TARGET.

2073	REF	242	LAST	522	25,2725	4 0154 0	CS	MPAC	DCT WAS NEGATIVE OF DESIRED ANGLE.
2074					25,2726	0 0006 1	EXTEND		
2075	REF	1			25,2727	7 3175 1	MP	RDESGAIN	SCALING CN INPLT ANGLE WAS 4 RADIAN.
2076	REF	3	LAST	537	25,2730	551354 0	TS	TRUNNACMC	TRUNNAC COMMAND FOR PROUT
2077	REF	75	LAST	548	25,2731	4 0110 0	CS	RADMODES	A RELAY IN THE RR REVERSES POLARITY OF
2078	REF	22	LAST	510	25,2732	7 4740 1	MASK	BIT12	THE SHAFT COMMANDS IN MODE 2 SO THAT A
2079					25,2733	0 0006 1	EXTEND		POSITIVE TORQUE APPLIED TO THE SHAFT
2080					25,2734	1 2737 1	PZF	+3	GYRO CAUSES A POSITIVE CHANGE IN THE
2081	REF	15	LAST	550	25,2735	3 1107 0	CA	TANG +1	SHAFT ANGLE. COMPENSATE FOR THIS SWITCH
2082					25,2736	1 2740 1	TCF	+2	BY CHANGING THE POLARITY OF CUR COMMAND.
2083	REF	16	LAST	552	25,2737	4 1107 1	CS	TANG +1	
2084					25,2740	0 0006 1	EXTEND		
2085	REF	2	LAST	552	25,2741	7 3175 1	MP	RDESGAIN	SCALING CN INPLT ANGLE WAS 4 RADIAN.
2086	REF	1			25,2742	551355 1	TS	SHAFTCMC	SHAFT COMMAND FOR PROUT
2087	REF	47	LAST	550	25,2743	0 6042 1	TC	INTPRET	
2088					25,2744	41345 0	CLOAD	DMP	
2089					25,2745	00003 1		2	CCS(S).
2090					25,2746	00005 1		4	COS(T).
2091					25,2747	65352 0	SL1	PDDL	Z COMPONENT OF LRR.
2092					25,2750	65276 1	CCCMF	PDDL	Y COMPONENT = -SIN(T).
2093					25,2751	00001 0		0	SIN(S).
2094					25,2752	72405 0	DMP	SL1	
2095					25,2753	00005 1		4	CCS(T).
2096					25,2754	43166 0	VDEF	BON	FORM URR IN NB AXES.
2097	REF	4	LAST	550	25,2755	00311 1		RABSW	EYPASS NESM CONVERSION IN VERB 41.
2098					25,2756	52761 0		+2	
2099					25,2757	77624 1	CALL		
2100	REF	1			25,2760	47675 0		*NBSM*	GET URR IN SM AXES.
2101					25,2761	77441 0	DOT	EXIT	
2102	REF	7	LAST	550	25,2762	01101 0		PRTARGET	GET CCSINE OF ANGLE BETWEEN RP AND LCS.
2103					25,2763	0 0006 1	EXTEND		
2104	REF	1			25,2764	4 3177 0	CS	CCS1/2DG	
2105	REF	243	LAST	552	25,2765	20 155 1	CAS	MPAC	DIFFERENCE OF COSINES, SCALED B-2.
2106	REF	244	LAST	552	25,2766	10 154 0	CCS	MPAC	
2107	REF	115	LAST	543	25,2767	3 4755 1	CA	ZERC	IF CCS ERROR BIGGER, ERROR IS SMALLER.
2108					25,2770	1 2772 0	TCF	+2	
2109	REF	68	LAST	539	25,2771	3 4753 1	CA	ONE	
2110	REF	245	LAST	552	25,2772	54 155 1	TS	MPAC +1	ZERC IF RR IS POINTED OK, ONE IF NOT.

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P2111 SEE IF TRACKER SHOULD BE ENABLED OR DISABLED.

2111	REF	76	LAST	552	25,2773	10 113 0	CCS	RADMODES	IF CONTINUOUS DESIGNATE WANTED, PUT OUT
2113	REF	1			25,2774	1 2777 0	TCF	SIGNLCHK	COMMANDS WITHOUT CHECKING MAGNITUDE OF
2114	REF	2	LAST	553	25,2775	1 2777 0	TCF	SIGNLCHK	ERROR SIGNALS
2115	REF	1			25,2776	1 3027 0	TCF	DCRRCLT	
2116	REF	246	LAST	552	25,2777	10 155 1	SIGNLCHK	CCS	MPAC +1
2117	REF	1			25,3000	1 3010 1	TCF	DCRRCLT	SEE IF BOTH AXES WERE WITHIN .5 DECS.
2118	REF	38	LAST	541	25,3001	4 0074 0	CS	STATE	IF WITHIN LIMITS AND NO LOCK-ON WANTED,
2119	REF	1			25,3002	7 4747 0	MASK	LCKENBIT	PROBLEM IS FINISHED.
2120	REF	192	LAST	548	25,3003	10 000 0	CCS	A	
2121	REF	1			25,3004	1 3015 1	TCF	RRDESCUN	
2122	REF	51	LAST	515	25,3005	3 4736 1	CAF	BIT14	ENABLE THE TRACKER.
2123					25,3006	0 0006 1	EXTEND		
2124	REF	34	LAST	548	25,3007	05 012 1	WCP	CHAN12	
2125	REF	23	LAST	519	25,3010	3 4750 1	DCRRCLT	CAF	BIT4
2126					25,3011	0 0006 1	EXTEND		SEE IF DATA GOOD RECEIVED YET
2127	REF	11	LAST	519	25,3012	02 033 0	RAND	CHAN33	
2128	REF	193	LAST	553	25,3013	10 000 0	CCS	A	
2129	REF	2	LAST	553	25,3014	1 3027 0	TCF	DCRRCLT	
2130	REF	28	LAST	478	25,3015	4 4742 0	RRDESCUN	CS	BIT10
2131	REF	77	LAST	552	25,3016	7 0111 0	MASK	RADMODES	WHEN PROBLEM DONE, REMOVE BIT 10 SO NEXT
2132					25,3017	0 0014 0	INFINIT		WAITLIST TASK WE WILL GO TO RECOND.
2133	REF	78	LAST	553	25,3020	54 111 0	IS	RADMODES	
2134	REF	59	LAST	548	25,3021	0 5516 0	TC	DOWNFLAG	RESET LOSCMFLG TO PREVENT A
2135	REF	7	LAST	545	25,3022	10 041 1	ADRES	LOSCMFLG	RECOMPUTATION OF LOS AFTER DATA GOOD
2136	REF	22	LAST	532	25,3023	4 4752 1	CS	BIT2	TURN OFF ENABLE RR ERROR COUNTER
2137					25,3024	0 0006 1	EXTEND		
2138	REF	35	LAST	553	25,3025	03 012 1	WAND	CHAN12	
2139	REF	92	LAST	545	25,3026	1 5155 1	TCF	ENDOFJCE	WITH ECTR DISABLED.
2140	REF	8	LAST	499	25,3027	3 0176 0	DCRRCLT	CA	FLAGWRD2
2141	REF	1			25,3030	7 7715 1	MASK	BIT12,14	IF BOTH LOSCMFLAG AND SEARCH FLAG ARE
2142					25,3031	0 0006 1	EXTEND		ZERO, BYPASS VELOCITY ADJUSTMENT TO LOS
2143	REF	1			25,3032	1 3051 1	BZF	NCTP20	
2144	REF	48	LAST	552	25,3033	0 6042 1	TC	INTPRET	
2145					25,3034	74375 0	VLCAD	VXSC	MULTIPLY UNIT LOS BY MAGNITUDE
2146	REF	8	LAST	552	25,3035	01101 0		RRTARGET	
2147	REF	2	LAST	550	25,3036	01767 0		WLCSV	
2148					25,3037	41572 1	VSL1	PLSH	
2149					25,3040	74375 0	VLCAD	VXSC	ADD .5 SEC. OF VELOCITY
2150	REF	3	LAST	550	25,3041	01761 0		LCSVCL	TO LOS VECTOR
2151	REF	2	LAST	550	25,3042	13111 0		MOTOMS	
2152					25,3043	53362 0	VSRI	VAD	
2153					25,3044	77656 1	UNIT		
2154	REF	9	LAST	553	25,3045	15101 0	STCDL	RRTARGET	STORE VELOCITY-CORRECTED LOS (UNIT)

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2155				25,3146	70745 0		360	
2156	REF	3	LAST	553	25,3047	01767 0	STORE	MLCSV
2157					25,3050	77776 1	EXIT	AND STORE MAGNITUDE
2158					25,3051	0 5014 0	NCTP20	INFINIT
2159	REF	79	LAST	553	25,3152	4 0110 0	CS	PAOCCES
2160	REF	5	LAST	548	25,3153	7 4741 0	MASK	REPOSBIT
2161	REF	194	LAST	553	25,3054	10 000 0	CCS	A
2162	REF	2	LAST	536	25,3155	0 2217 0	TC	PRCUT
2163	REF	9	LAST	553	25,3056	3 0076 0	CA	FLAGWRD2
2164	REF	1			25,3057	7 4740 1	MASK	LCSCMBIT
2165					25,3060	0 0006 1	EXTEND	IF LOSCMFLG NOT SET, DCN'T TEST
2166	REF	93	LAST	553	25,3061	1 5155 1	BZF	ENDOFJOB
2167	REF	25	LAST	548	25,3062	11 4556 0	CCS	LCSCCUNT
2168	REF	1			25,3063	0 3073 0	TC	DDOSEND
2170	REF	5	LAST	518	25,3064	0 6032 0	TC	KILLTASK
2171	REF	2	LAST	548	25,3065	52613 1	CADR	DESLOCP +2
2172					25,3066	0 0003 1	RELINT	YES - KILL TASK WHICH SCHEDULES OCCES
2173	REF	3	LAST	379	25,3067	10 767 1	CCS	NEWJOB
2174	REF	2	LAST	379	25,3070	0 5122 0	TC	CHANG1
2175	REF	148	LAST	522	25,3071	0 4616 1	TC	BANKCALL
2176	REF	1			25,3072	50732 1	CADR	R21LEM2
2177	REF	26	LAST	554	25,3073	55 456 0	DDOSEND	TS
2178	REF	94	LAST	554	25,3074	0 5155 0	TC	LCSCCUNT
2179					25,3075	21122 0	DDOSEND	ENDOFJOB
21795	REF	1			7715		DDOSEND	ENDOFJOB
2180					25,3176	07777 1	DDOSEND	ENDOFJOB
2180					25,3077	33005 1	DDOSEND	ENDOFJOB
2181					25,3100	00310 0	DDOSEND	ENDOFJOB
2181					25,3101	00000 1	DDOSEND	ENDOFJOB

2179 25,3075 21122 0 RDFS GAIN DEC .53624 TRIES TO NULL .5 ERROR IN .5 SEC.

21795 REF 1 7715 BIT12,14 EQUALS PRI024 OCT 24000

2180 25,3176 07777 1 CCS1/200 20FC .999961923 E-2 COSINE OF 0.5 DEGREES.

2180 25,3077 33005 1

2181 25,3100 00310 0 MCTOMS 20FC 100 R-13

2181 25,3101 00000 1

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P2182 RADAR READ INITIALIZATION

R2183 RADAR DATA ARE READ BY A BANKCALL FOR THE APPROPRIATE LEAD-IN BELOW.

2184	REF	1		25,3102	0 3122 0	LRALT	TC	INITREAD -1	CNE SAMPLE PER READING.
2185				25,3103	00017 1	ALLREAD	CCT	17	

2186	REF	2	LAST	555	25,3104	0 3123 1	LRVELZ	TC	INITREAD
2187					25,3105	00016 0		CCT	16

2188	REF	3	LAST	555	25,3106	0 3123 1	LRVELY	TC	INITREAD
2189					25,3107	00015 0		CCT	15

2190	REF	4	LAST	555	25,3110	0 3123 1	LRVELX	TC	INITREAD
2191					25,3111	00014 1		CCT	14

2192	REF	5	LAST	555	25,3112	0 3122 0	RRPCOT	TC	INITREAD -1
2193					25,3113	00012 1		CCT	12

2194	REF	6	LAST	555	25,3114	0 3122 0	RRRANCE	TC	INITREAD -1
2195					25,3115	00011 1		CCT	11

R2196 LRVEL IS THE ENTRY TO THE LR VELOCITY READ RELTIME WHEN 5 SAMPLES ARE
 P2197 WANTED. ENTER WITH C(A)= 1,2,4 FOR LRVELZ,LRVELY,LRVELX RESP.

2198	REF	1			25,3116	55'174 1	LRVEL	TS	TIMEHOLD	STORE VEFAM INDEX HERE MOMENTARILY
2199	REF	11	LAST	505	25,3117	3 4756 1	CAF	FIVE		SPECIFY FIVE SAMPLES
2200	REF	2	LAST	555	25,3120	51'104 0	INDEX	TIMEHOLD		
2201	REF	2	LAST	403	25,3121	1 3104 0	TCF	LRVELZ		

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2202	REF	65	LAST	552	25,3122	3 4753 1	-1	CAF	CNE	ENTRY TO TAKE ONLY 1 SAMPLE.
2203					25,3123	0 0004 0		INITREAD	INHINT	
2204	REF	3	LAST	555	25,3124	55'104 1		TS	TIMEHOLD	GFT DT OF MIDPOINT OF NOMINAL SAMPLING
2205					25,3125	0 0006 1		EXTEND		INTERVAL (ASSUMES NO BAD SAMPLES WILL BE
2206	REF	25	LAST	491	25,3126	7 4751 1		MP	BIT3	ENCOUNTERED).
2207	REF	4	LAST	556	25,3127	53'105 0		DXCH	TIMEHOLD	
2208	REF	195	LAST	554	25,3130	10 000 0		CCS	A	
2209	REF	1			25,3131	55'110 1		TS	NSAMP	
2210	REF	70	LAST	556	25,3132	6 4753 1		AD	CNE	
2211					INSERT FOLLOWING INSTRUCTION TO GET 2N TRIES FOR N SAMPLES.					
2212					COMPLE					
2213	REF	2	LAST	223	25,3133	55'077 1		TS	SAMPLIM	
2214	REF	1			25,3134	3 3156 0		CAF	DGBITS	READ CURRENT VALUE OF DATA GCCC BITS.
2215					25,3135	0 0006 1		EXTEND		
2216	REF	12	LAST	553	25,3136	02 033 0		RAND	CHAN33	
2217	REF	1			25,3137	55'112 0		TS	OLCATAGD	
2218	REF	1			25,3140	4 3103 1		CS	ALLREAD	
2219					25,3141	0 0006 1		EXTEND		
2220	REF	8	LAST	472	25,3142	03 013 0		WAMP	CHAN13	REMOVE ALL RADAR BITS
2221	REF	164	LAST	546	25,3143	50 002 0		INDEX	Q	
2222					25,3144	3 0000 1		CAF	Q	
2223	REF	22	LAST	521	25,3145	8 4674 0		IC	IRNKCALL	
2224	REF	1			25,3146	36000 1		CAFR	PADSTART	
2225					25,3147	1 0006 1		EXTEND		
2226	REF	14	LAST	464	25,3150	3 0025 0		ECA	TIME2	
2227	REF	5	LAST	556	25,3151	21'105 0		DAS	TIMEHOLD	TIME OF NOMINAL MIDPOINT.
2228	REF	116	LAST	552	25,3152	3 4755 1		CAF	ZERO	
2229	REF	76	LAST	546	25,3153	54 001 1		TS	L	
2230	REF	3	LAST	492	25,3154	53'101 1		DXCH	SAMPLSUM	
2231	REF	2	LAST	535	25,3155	1 2377 1		TCF	RCADBACK	
2232					25,3156	00230 0		DGBITS	EOT	230

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P2232 RADAR RLPT READER

R2234 THIS ROUTINE STARTS FROM A RADARUPT. IT READS THE DATA & LOTS MORE.

2235 RFF 2 LAST 41 25,2000 SETLOC RADARUPT
2236 25,3157 BANK

2237 RFF 2 LAST 41 TO 41: 3 3* COUNT# \$\$/RUPT
2238 25,3157 0 0006 1 RADAREAD EXTENC MUST SAVE SBANK BECAUSE OF RLPT EXITS

2239 RFF 10 LAST 458 25,3160 04 007 1 RCP SLPERENK VIA TASKOVER (BACENC OR ECCENC).

2240 RFF 3 LAST 254 25,3161 54 016 1 TS BANKPLPT

2241 25,3162 0 0006 1 EXTENC

2242 RFF 3 LAST 254 25,3163 22 012 1 GXCH QRLPT

22421 25,3164 0 0006 1 EXTEND

22422 RFF 16 LAST 317 25,3165 3 1454 0 DCA TICGC

22423 RFF 2 LAST 317 25,3166 52 1272 0 DXCH TICIG

LOAD TIME TO TIC
FOR P65 RADAR READING.

2243 RFF 8 LAST 505 25,3167 3 4757 0 CAF SEVEN

2244 25,3170 0 0006 1 EXTEND

2245 RFF 9 LAST 556 25,3171 02 013 1 RANC CHAN13

2246 RFF 2 LAST 107 25,3172 55 1332 0 TS DNINDEX

2247 25,3173 0 0006 1 EXTEND

2248 RFF 1 25,3174 1 3200 1 BZF TRYCOUNT

IF RADAR SELECT BITS ZERO, CC NCT STOPPE
DATA FOR DOWNLIST (FPASSABLE PROBLEMS)

2249 RFF 1 25,3175 3 0046 0 CA RNRAC

2250 RFF 3 LAST 557 25,3176 51 1332 1 INDFX DNINDEX

2251 RFF 5 LAST 317 25,3177 55 1327 1 TS DNRANGE -1

2252 RFF 3 LAST 556 25,3200 11 0077 1 TRYCCUNT CCS SAMPLIM

2253 RFF 1 25,3201 1 3223 0 TCF PLENTY

2254 RFF 1 25,3202 1 3205 1 TCF NOMORE

2255 RFF 24 LAST 545 25,3203 0 5567 0 TC ALARM

2256 25,3204 0 0520 0 OCT 520

2257 RFF 16 LAST 260 25,3205 0 5270 1 TC RESUME

2258 RFF 3 LAST 281 25,3206 3 0107 1 NOMORE CA FLGWRD11

2259 RFF 3 LAST 281 25,3207 7 4735 0 MASK LRPRIT

2260 25,3210 0 0006 1 EXTEND

2261 RFF 1 25,3211 1 3221 0 BZF BADRAD

IS LRBPASS SET?

NO. RI2 IS ON -- BYPASS 521 ALARM.

2262 RFF 10 LAST 375 25,3212 4 0077 0 CS FLAGWRD3

2263 RFF 4 LAST 278 25,3213 7 4743 1 MASK PC4FLR11

2264 25,3214 0 0006 1 EXTENC

2265 RFF 2 LAST 557 25,3215 1 3220 0 BZF BADRAD

CHECK PC4FLAG.
IF 1, PC4 IS RUNNING. CC NCT ALARM-

2266 RFF 25 LAST 557 25,3216 0 5567 0 TC ALARM

2267 25,3217 0 0521 1 OCT 521

2268 RFF 71 LAST 556 25,3220 4 4753 0 PADRAD CS ONE

2269 RFF 4 LAST 557 25,3221 55 1077 1 TS SAMPLIM

2270 RFF 2 LAST 548 25,3222 0 3543 0 TC REPACENC -2

2271 RFF 5 LAST 557 25,3223 55 1077 1 PLENTY TS SAMPLIM

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2272	RFF	26	LAST	556	25,3224	3 4751 0	CAF	BIT3	
2273					25,3225	0 0006 1	EXTEND		
2274	RFF	10	LAST	557	25,3226	02 013 1	RAND	CHAN13	TO FIND OUT WHICH RADAR
2275					25,3227	0 0006 1	EXTEND		
2276	RFF	1			25,3230	1 3277 1	BZF	READRAD	
2277	RFF	1			25,3231	0 3365 1	TC	R77CHECK	R77 QUITs HERE.
2287	RFF	1			25,3232	3 6250 0	CAF	BIN3	= 00003 CCT
2288					25,3233	0 0006 1	EXTEND		
2289	RFF	11	LAST	558	25,3234	06 013 0	RXCR	CHAN13	RESET ACTIVITY BIT
2290	RFF	2	LAST	558	25,3235	7 6250 1	MASK	BIN3	
2291					25,3236	0 0006 1	EXTEND		
2292	RFF	1			25,3237	1 2273 0	BZF	LRHEIGHT	TAKE A LR RANCE READING
2293	RFF	12	LAST	527	25,3240	3 4733 1	CAF	PCSMAX	
2294	RFF	2	LAST	557	25,3241	7 0046 1	MASK	RNFAD	
2295	RFF	1			25,3242	6 2000 0	AD	LVLBIAS	
2296	RFF	77	LAST	556	25,3243	54 001 1	TS	L	
2297	RFF	3	LAST	558	25,3244	30 046 0	CAF	RNFAD	
2298					25,3245	6 0000 1	DOUBLE		
2299	RFF	28	LAST	529	25,3246	7 4753 0	MASK	BIT1	
2300	RFF	7	LAST	258	25,3247	52 064 1	EXCH	ITEMP3	
2301	RFF	26	LAST	526	25,3250	3 4744 1	CAF	BIT8	DATA GOOD ISNT CHECKED UNTIL AFTER READ-
2302	RFF	1			25,3251	7 3425 1	TC	DCCHECK	ING DATA SO SOME RADAR TESTS WILL WORK
A2303									INDEPENDENT OF DATA GOOD.
2304	RFF	2	LAST	556	25,3252	11 111 1	CS	NSAMP	
2305	RFF	1			25,3253	0 3263 1	TC	NCEND	
2306	RFF	72	LAST	557	25,3254	4 4753 0	CS	ONE	
2307	RFF	6	LAST	557	25,3255	55 077 1	TS	SAMPLIN	
2308	RFF	19	LAST	546	25,3256	4 0061 1	CS	ITEMP1	WHEN ENOUGH GOOD DATA HAS BEEN GATHERED,
2309	RFF	80	LAST	554	25,3257	7 0110 0	MASK	RADMCCES	RESET DATA FAIL FLAGS FOR SETTRK.
2310	RFF	81	LAST	558	25,3260	54 110 0	TS	RADMCCES	
2311	RFF	1			25,3261	6 3572 1	TC	RADLITES	LAMPS MAY GO OFF IF DATA JUST GOOD.
2312	RFF	2	LAST	534	25,3262	0 3536 1	TC	RGOODEND -2	
2313	RFF	2	LAST	558	25,3263	55 110 1	NCEND	TS	NSAMP
2314	RFF	7	LAST	558	25,3264	11 077 1	RESAMPLE	CCS	SAMPLIN
2315					25,3265	1 3267 0	TCF	+2	SEE IF ANY MORE TRIES SHOULD BE MADE.
2316	RFF	1			25,3266	1 3444 1	TCF	DATAFAIL	N SAMPLES NOT AVAILABLE.
2317	RFF	24	LAST	553	25,3267	3 4751 1	CAF	BIT4	RESET ACTIVITY BIT.
2318	RFF	23	LAST	556	25,3270	0 4674 0	TC	IPKCALL	
2319	RFF	2	LAST	556	25,3271	3670 1	CAF	RADSTART	
2320	RFF	17	LAST	557	25,3272	0 5270 1	TC	RESUME	
2321	RFF	27	LAST	490	25,3273	3 4747 1	LRHEIGHT	CAF	BIT5
2322	RFF	20	LAST	558	25,3274	54 061 1	TS	ITEMP1	(POSITION OF DATA GOOD BIT IN CHAN 33)

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2323	REF	18	LAST	322	25,3275	2 4743 0	CAF	BIT9		
2324	REF	1			25,3276	0 2321 1	TC	SCALECHK	-1	
2325	REF	6	LAST	554	25,3277	3 4741 1	RENDRAD	CAF	REPOSRT	MAKE SURE ANTENNA HAS NOT GONE OUT OF
2326	REF	82	LAST	558	25,3300	7 0110 0	MASK	PADMCCES		LIMITS.
2327	REF	156	LAST	556	25,3311	10 000 0	CCS	A		
2328	REF	3	LAST	557	25,3302	1 3220 0	TCF	BADRAD		
2329	REF	83	LAST	559	25,3313	4 0110 0	CS	PADMCCES		BE SURE RR CPU HASNT FAILED.
2330	REF	5	LAST	472	25,3304	7 4745 1	MASK	PCDUBBIT		
2331	REF	197	LAST	559	25,3305	10 000 0	CCS	A		
2332	REF	4	LAST	559	25,3306	1 3220 0	TCF	BADRAD		
2333	REF	25	LAST	558	25,3307	3 4750 1	CAF	BIT4		SEE IF DATA HAS BEEN GOOD.
2334	REF	21	LAST	558	25,3311	54 061 1	TS	ITEMP1		(POSITION OF DATA GOOD BIT IN CHAN 33)
2335	REF	29	LAST	558	25,3311	3 4753 1	CAF	BIT1		SEE IF RR RECT.
2336					25,3312	0 0006 1	EXTEND			
2337	REF	12	LAST	558	25,3313	02 012 1	RAND	CHAN13		
2338	REF	167	LAST	556	25,3314	54 002 1	TS	Q		FOR LATER TESTING.
2339	REF	158	LAST	559	25,3315	10 000 0	CCS	A		
2340					25,3316	1 3220 1	TCF	+2		
2341	REF	1			25,3317	1 3332 1	TCF	PADIN		NO SCALE CHECK FOR RR RECT.
2342	REF	27	LAST	558	25,3320	3 4751 0	CAF	BIT3		
2343	REF	78	LAST	558	25,3321	54 001 1	TS	L		
2344					25,3322	0 0006 1	SCALECHK	EXTEND		
2345	REF	13	LAST	556	25,3323	02 033 0	RAND	CHAN33		SCALE STATUS NOW
2346	REF	79	LAST	559	25,3324	56 001 0	XCF	L		
2347	REF	84	LAST	559	25,3325	7 0110 0	MASK	PADMCCES		SCALE STATUS BEFORE
2348					25,3326	0 0006 1	EXTEND			
2349	REF	12	LAST	554	25,3327	06 001 0	PXCR	LOCHAN		SEE IF THEY DIFFER
2350	REF	199	LAST	559	25,3330	10 000 0	CCS	A		
2351	REF	1			25,3331	1 3351 0	TC	SCALCFNG		THEY DIFFER
2352	REF	13	LAST	558	25,3332	3 4733 1	PADIN	CAF	PCSMAX	
2353	REF	4	LAST	558	25,3333	7 0046 1	MASK	RNRAD		
2354	REF	5	LAST	258	25,3334	54 064 1	TS	ITEMP4		
2355	REF	5	LAST	559	25,3335	20 046 0	CAF	RNRAD		
2356					25,3336	6 0000 1	DOUBLE			
2357	REF	20	LAST	559	25,3337	7 4753 0	MASK	BIT1		
2358	REF	8	LAST	558	25,3340	54 063 0	TS	ITEMP3		
2359	REF	168	LAST	559	25,3341	13 002 1	CCS	Q		SEE IF RR RECT.
2360	REF	1			25,3342	1 3403 1	TCF	SCALACJ		NOW, BUT SCALE CHANGING MAY BE NEEDED.
2361					25,3343	0 0006 1	EXTEND			IF RR RANGE RATE, THROW OUT BIAS.
2362	REF	1			25,3344	4 2002 0	CCS	PCDUBIAS		
2363	REF	9	LAST	559	25,3345	20 064 1	DASAPPL	CAS	ITEMP3	

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2364	REF	22	LAST	559	25,3346	3 0061 0	DCCHECK2	CA	ITEMP1	SEE THAT DATA HAS BEEN GOOD BEFORE AND
2365	REF	2	LAST	559	25,3347	0 3426 1		TC	DCCHECK +1	AFTER TAKING SAMPLE.
2366	REF	1			25,3350	0 2254 1		TC	GOODRAD	

2367	REF	85	LAST	559	25,3351	22 110 1	SCALCFNG	LXCH	RADMODES	
2368	REF	31	LAST	559	25,3352	6 4753 1		AD	RIT1	
2369					25,3353	0 0006 1		EXTEND		
2370	REF	13	LAST	559	25,3354	06 001 0		RXCR	LCHAN	
2371	REF	96	LAST	560	25,3355	54 110 0		TS	RADMODES	
2372	REF	2	LAST	556	25,3356	3 3156 0		CAF	DGBITS	UPDATE LAST VALUE OF DATA GOOD BITS.
2373					25,3357	0 0006 1		EXTEND		
2374	REF	14	LAST	559	25,3360	02 033 0		RAND	CHAN33	
2375	REF	2	LAST	556	25,3361	55 112 0		TS	OLEATAGE	
2376	REF	34	LAST	521	25,3362	0 55 4 0		TC	UPFLAG	SET RNGSCFLG
2377	REF	1			25,3363	00120 1		ACRES	RNGSCFLG	FOR LRS24.1
2378	REF	5	LAST	559	25,3364	1 3220 0		TCF	RADRAD	

R2379 P77 MUST IGNORE DATA FAILS SO AS NOT TO DISTURB THE ASTRONAUT.

2380	REF	16	LAST	492	25,3365	4 0101 0	R77CHECK	CS	FLAGWRD5	
2381	REF	4	LAST	492	25,3366	7 4741 0		MASK	P77FLBIT	
2382	REF	200	LAST	559	25,3367	10 000 0		CCS	A	
2383	REF	169	LAST	559	25,3370	0 0002 0		TC	C	NOT P77
2384	REF	1			25,3371	4 3402 0		CS	BITS5,8	UPDATE LR DATA GOOD BITS IN RADMODES
2385	REF	87	LAST	560	25,3372	7 0110 0		MASK	RADMODES	
2386	REF	80	LAST	559	25,3373	54 001 1		TS	L	
2387	REF	2	LAST	560	25,3374	3 3402 1		CA	BITS5,8	
2388					25,3375	0 0006 1		EXTEND		
2389	REF	15	LAST	560	25,3376	02 033 0		RAND	CHAN33	
2390	REF	81	LAST	560	25,3377	6 0001 0		AD	L	
2391	REF	88	LAST	560	25,3400	54 110 0		TS	RADMODES	
2392	REF	3	LAST	558	25,3401	1 3536 1		TC	PGCODENC -2	
2393					25,3402	00220 1	BITS5,8	OCT	220	

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P2394 THE FOLLOWING ROUTINE INCORPORATES RR RANGE AND LP ALT SCALE INFORMATION AND LEAVES DATA AT LC SCALE.

2396	REF	82	LAST	560	25,3403	10 001 1	SCALADJ	CCS	L	L HAS SCALE INBIT FOR THIS RADAR.
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2397					25,3404	1 3476 1		TCF	+2	CN HIGH SCALE.
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2398	REF	1			25,3405	1 3346 1		TCF	DCCHECK2	
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2399	REF	4	LAST	557	25,3406	2 1332 1		CA	CNINDEX	
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2400	REF	28	LAST	559	25,3407	7 4751 1		MASK	BIT3	
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2401	REF	201	LAST	560	25,3410	10 000 0		CCS	A	
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2402	REF	1			25,3411	1 2420 0		TCF	LPSCK	
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2403	REF	11	LAST	555	25,3412	52 064 1		DXCH	ITEMP3	
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2404					25,3413	20 001 1		DDOUBL		
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2405					25,3414	20 001 1		DDOUBL		
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2406					25,3415	20 001 1		DDOUBL		
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2407	REF	11	LAST	561	25,3416	52 064 1		DXCH	ITEMP3	
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2408	REF	2	LAST	561	25,3417	1 3346 1		TCF	DCCHECK2	
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2422					25,3420	0 0006 1	LPSCK	EXTEND		
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2423	REF	12	LAST	561	25,3421	2 0064 0		CA	ITEMP3	
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2424					25,3422	20 001 1		DDOUBL		
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2425					25,3423	20 001 1		DDOUBL		
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2426	REF	1			25,3424	1 3346 1		TCF	DASAMPL	
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2428	REF	23	LAST	560	25,3425	54 061 1	DCCHECK	TS	ITEMP1	
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2429					25,3426	0 0006 1		EXTEND		
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2430	REF	16	LAST	560	25,3427	02 032 0		RAND	CHAN33	
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2431	REF	83	LAST	561	25,3430	54 001 1		TS	L	
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2432	REF	24	LAST	561	25,3431	4 0361 1		CS	ITEMP1	
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2433	REF	3	LAST	560	25,3432	7 1112 0		MASK	OLDATAGE	
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2434	REF	84	LAST	561	25,3433	6 0001 0		AD	L	
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2435	REF	4	LAST	561	25,3434	57 1112 1		XCH	OLDATAGE	
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2436	REF	25	LAST	561	25,3435	7 0061 1		MASK	ITEMP1	
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2437	REF	85	LAST	561	25,3436	6 0001 0		AD	L	
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2438	REF	202	LAST	561	25,3437	10 000 0		CCS	A	
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2439	REF	1			25,3440	0 3264 1		TC	RESAMPLE	
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2440	REF	13	LAST	561	25,3441	52 064 1		DXCH	ITEMP3	
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2441	REF	4	LAST	556	25,3442	21 1101 1		DAS	SAMPLESUM	
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2442	REF	170	LAST	560	25,3443	0 0002 0		TC	G	
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2443	REF	26	LAST	561	25,3444	4 0061 1	DATAFAIL	CS	ITEMP1	
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2444	REF	89	LAST	560	25,3445	7 1110 0		MASK	PADM005	
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2445	REF	27	LAST	561	25,3446	6 0061 0		AD	ITEMP1	
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2446	REF	90	LAST	561	25,3447	54 110 0		TS	PADM005	
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2447	REF	14	LAST	561	25,3450	52 064 1		DXCH	ITEMP3	
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2448	REF	5	LAST	561	25,3451	52 101 1		DXCH	SAMPLESUM	
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UPDATE DATA GOOD BIT IN OLDATAGE AND MAKE SURE IT WAS ON BEFORE AND AFTER THE SAMPLE WAS TAKEN BEFORE RETURNING. IF NOT, GOES TO RESAMPLE TO TRY AGAIN. IF MAX NUMBER OF TRIES HAS BEEN REACHED, THE BIT CORRESPONDING TO THE DATA GOOD WHICH FAILED TO APPEAR IS IN ITEMPI AND CAN BE USED TO SET PADM005 WHICH VIA SETTRKE SETS THE TRACKER FAIL LAMP.

SHOULD BE THE SAME ZERO.

IF DATA GOOD BEFORE AND AFTER, ADD TO ACCUMULATION.

IN THE ABOVE CASE, SET PADM005 BIT SHOWING SOME RADAR DATA FAILED.

IF WE HAVE BEEN UNABLE TO GATHER A SAMPLES, USE LAST ONE ONLY.

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2449	REF	2	LAST	55E	25,3452	0 3572 1
2450	REF	2	LAST	557	25,3452	1 3216 1

TC	RACILITES
TCF	NOMORE

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P2451 COATING TO PROTECT CHANNEL 13 WILL PADAR READ IS IN CRITICAL PERIOD

2453	REF	1		17,2000			SETLCC C13BANK		
2454				17,2000			BANK		
2455	REF	171	LAST	561	17,2000	54 002 1	RACSTART TS	Q	
2456					17,2001	0 0026 1	+1	EXTEND	
2457	REF	4	LAST	382	17,2002	00 004 0	READ	LCSCALAR	READ PRESENT TIME
2458	REF	86	LAST	561	17,2003	54 001 1	TS	L	
2459	REF	8	LAST	446	17,2004	7 4346 0	MASK	LCW5	ONLY THE LCW 5 BITS MATTER
2460					17,2005	4 0000 0	CCM		
2461	REF	39	LAST	493	17,2006	6 4746 0	AD	B1*6	COMPUTE DELTA TIME TO NEXT 15 TICK
2462	REF	9	LAST	563	17,2007	7 4346 0	MASK	LCW5	
2463	REF	1			17,2010	55 270 1	TS	RADDEL	
2464	REF	4	LAST	495	17,2011	6 7751 0	AD	NEG2	IF A TICKING OF TS IS NEAR, WAIT UNTIL
2465					17,2012	0 0006 1	EXTEND		IT HAS TICKED. THE MAX DELAY HERE WILL
2466	REF	3	LAST	558	17,2013	6 2001 1	PZMF	RACSTART +1	BE 927.6 MICROSECONDS
2467	REF	172	LAST	563	17,2014	3 0002 0	CA	Q	
2468					17,2015	1 0006 1	EXTEND		IT IS SAFE TO SET THE ACTIVITY BIT NOW
2469	REF	13	LAST	559	17,2016	05 013 0	WCR	CHAN13	BECAUSE OF THE ABOVE LCCP
2470	REF	87	LAST	563	17,2017	4 0001 1	CS	L	
2471	REF	1			17,2020	55 267 1	TS	PADTIME	SAVE NEGATIVE TIME OF READ
2472	REF	1			17,2021	0 4707 0	TC	ISWRETRN	
2473	REF	1			17,2022	55 266 0	C13STALL TS	C13PSAV	
2477	REF	26	LAST	559	17,2023	3 4750 1	CA	PIT4	
2478					17,2024	0 0006 1	EXTEND		
2479	REF	14	LAST	563	17,2025	02 013 1	RANC	CHAN13	
2480					17,2026	0 0006 1	EXTEND		
2481	REF	1			17,2027	1 2050 1	BZF	TCQSTAL	IF NO PADAR ACTIVITY, RETURN
24815					17,2030	12 031 0	C13SLCCP	NOOP	*** NECESSARY TO PREVENT A TC TRAP ***
2482					17,2031	0 0006 1	EXTEND		
2483	REF	5	LAST	563	17,2032	0 0004 0	READ	LCSCALAR	
2484	REF	2	LAST	563	17,2033	6 1267 0	AD	PACTIME	COMPUTE DELTA T SINCE LAST PADAR READ
2485	REF	7	LAST	534	17,2034	6 4736 1	AD	HALF	
2486	REF	8	LAST	563	17,2035	6 4736 1	AD	HALF	CORRECT FOR TIME OVERFLOW
2487	REF	88	LAST	563	17,2036	56 001 1	XCF	L	
2488	REF	1			17,2037	3 2053 0	CA	90MSCALR	
2489	REF	2	LAST	563	17,2040	6 1270 1	AD	RADDEL	
2490					17,2041	0 0006 1	EXTEND		
2491	REF	89	LAST	563	17,2042	60 001 0	SL	L	

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2492					17,2043	0 0006 1		EXTEND		
2493	REF	2	LAST	563	17,2044	6 2050 0		BZMF	TCCSTAL	FORBIDDEN ZONE IS PAST, RETURN
2494	REF	1			17,2045	6 2054 1		AD	-DTSCALR	
2495					17,2046	0 0006 1		EXTEND		
2496	REF	1			17,2047	6 2030 0		BZMF	C13SLOOP	IN THE FORBIDDEN PERIOD, LOOP UNTIL O.K.
2497	REF	173	LAST	563	17,2050	22 002 0	TCCSTAL	LXCF	C	ALL IS WELL, RETURN
2498	REF	2	LAST	563	17,2051	3 1266 1		CA	C13FSAV	
2499					17,2052	52 005 0		CTCF		
2500					17,2053	00440 1	90MSCALP	CCT	440	90 MILLISEC IN SCALAR
2501					17,2054	77754 1	-DTSCALR	CCT	77754	-5.9375 MS IN SCALAR
2502	REF	2	LAST	518	6000			SETLCC	FFTAC6	
2503					6022			BANK		
2504	REF	1			6022	3 7727 1	C13STALL	CAF	PRI036	PRIC36 = 36000 = FCADR (17,2000)
2505	REF	3	LAST	466	6022	56 004 0		XCF	FRANK	
2506	REF	1			6024	1 2022 1		ICF	C13STAL1	

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P2517 THIS ROUTINE CHANGES THE LR POSITION, AND CHECKS THAT IT OCT THERE.

2508 RFF 2 LAST 528 25,2000 SETLCC P20S1

2509 25,2454 BANK

2510 RFF 2 LAST 528 TC 557: 564 564* COUNT# \$\$/RSLB

2511 25,3454 0 0014 0 LRPCS2 INFINIT

2512 RFF 91 LAST 561 25,3455 4 1110 0 CS RADNCCES

2513 RFF 1 25,3456 7 4746 1 MASK LRPOSBIT

2514 RFF 92 LAST 565 25,3457 26 1110 0 ACS RADNCCES

SHOW DESIRED LR POSITION IS 2

2515 RFF 23 LAST 513 25,3460 3 4745 0 CAF BIT7

2516 25,3461 0 1110 1 EXTEND

2517 RFF 17 LAST 561 25,3462 0 0033 0 RAND CHAN33

SEE IF ALREADY THERE.

2518 25,3463 0 1110 1 EXTEND

2519 RFF 2 LAST 535 25,3464 1 3513 1 BZF RADNCCP

2520 RFF 24 LAST 425 25,3465 3 4737 0 CAF PIT13

2521 25,3466 0 1110 1 EXTEND

2522 RFF 26 LAST 553 25,3467 05 112 1 WCR CHAN12

COMMAND TO POSITION 2

2523 RFF 1 25,3470 3 2537 1 CAF 6SECS

START SCANNING FOR INBIT AFTER 7 SECS.

2524 RFF 22 LAST 543 25,3471 0 5203 0 TC WAITLIST

2525 RFF 27 LAST 554 27,1456 FBANK= LCSCCOUNT

2526 RFF 1 25,3472 0 3526 0 ZCADR LRPCSCAN

2526 RFF 1 25,3473 52067 1

2527 RFF 2 LAST 556 25,3474 0 2377 0 TC READBACK

2528 RFF 8 LAST 558 25,3475 551077 1 LRPCS NXT TS SAMPLIM

2529 RFF 9 LAST 548 25,3476 0 5221 0 TC FIXDELAY

SCAN ONCE PER SECOND 15 TIMES MAX AFTER

2530 25,3477 0 144 0 DFC 100

INITIAL DELAY OF 7 SECONDS.

2531 RFF 24 LAST 565 25,3500 3 4745 0 CAF BIT7

SEE IF LR PCS2 IS ON

2532 25,3501 0 0006 1 EXTEND

2533 RFF 18 LAST 565 25,3502 02 033 0 RAND CHAN33

2534 25,3503 0 1006 1 EXTEND

2535 RFF 1 25,3504 1 3520 1 BZF LASTLRDT

IF THERE, WAIT FINAL SECOND FOR BOUNCE.

2536 RFF 9 LAST 565 25,3505 111077 1 CCS SAMPLIM

SEE IF MAX TIME UP.

2537 RFF 1 25,3506 1 3475 0 TCF LRPOS NXT

2538 RFF 25 LAST 565 25,3507 4 4737 1 CS BIT13

IF TIME UP, DISABLE COMMAND AND ALARM.

2539 25,3510 0 1006 1 EXTEND

2540 RFF 27 LAST 565 25,3511 03 012 1 WAND CHAN12

2541 RFF 3 LAST 557 25,3512 1 3545 1 TCF RDRADEND

2542 RFF 73 LAST 558 25,3513 3 4753 1 RADNCCP CAF ONE

NO FURTHER ACTION REQUESTED.

2543 RFF 22 LAST 565 25,3514 0 5203 0 TC WAITLIST

2544 RFF 28 LAST 565 27,1456 FBANK= LCSCCOUNT

2545 RFF 4 LAST 560 25,3515 0 3547 0 ZCADR RDRADEND

2545 25,3516 52067 1

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2546	REF	4	LAST	565	25,3517	0 2377 0	TC	RCADBACK	
2547	REF	1			25,3520	3 5000 1	LASTLRDT CA	2 SECS	WAIT TWO SECONDS AFTER RECEIPT OF INBIT
2548	REF	3	LAST	166	25,3521	0 5224 0	TC	VARDelay	TO WAIT FOR ANTENNA BOUNCE TO DIE CLT.
2549	REF	26	LAST	565	25,3522	4 4737 1	CS	BIT13	REMOVE COMMAND
2550					25,3523	0 0006 1	EXTEND		
2551	REF	38	LAST	565	25,3524	03 012 1	WAND	CHAN12	
2552	REF	5	LAST	565	25,3525	1 3540 1	TCF	PGCCEND	
2553	REF	1			25,3526	3 4317 0	LRPOSCAN CAF	FLRTREN	SET UP FOR 15 SAMPLES.
2554	REF	2	LAST	565	25,3527	1 3475 0	TCF	LRPCSXT	
2555					25,3530	01130 1	6SECS	DEC	600

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P2556 SEQUENCES TO TERMINATE RR OPERATIONS.

2557	REF	6	LAST	556	25,3531	3 4745 0	ENCRADAR	CAF	PCCEFBIT	PROLOG TO CHECK RR CDL FAIL BEFORE END.
------	-----	---	------	-----	---------	----------	----------	-----	----------	---

2558	REF	93	LAST	565	25,3532	7 0110 0		MASK	RADMCDFS	
------	-----	----	------	-----	---------	----------	--	------	----------	--

2559	REF	203	LAST	561	25,3533	10 000 0		CCS	A	
------	-----	-----	------	-----	---------	----------	--	-----	---	--

2560	REF	6	LAST	566	25,3534	1 3540 1		TCF	RCCCDENC	
------	-----	---	------	-----	---------	----------	--	-----	----------	--

2561	REF	4	LAST	565	25,3535	1 3545 1		TCF	RDBADENC	
------	-----	---	------	-----	---------	----------	--	-----	----------	--

2562	REF	117	LAST	566	25,3536	4 4755 0	-2	CS	ZEPD	RCCCDENC WHEN NOT UNDER WAITLIST CONTROL
------	-----	-----	------	-----	---------	----------	----	----	------	--

2563	REF	2	LAST	59	25,3537	54 332 1		TS	RLPTAGN	
------	-----	---	------	----	---------	----------	--	----	---------	--

2564	REF	37	LAST	543	25,3540	3 4752 0	RCCDENC	CAF	TWC	
------	-----	----	------	-----	---------	----------	---------	-----	-----	--

2565	REF	37	LAST	522	25,3541	0 4635 0		TC	PCSTJUMP	
------	-----	----	------	-----	---------	----------	--	----	----------	--

2566	REF	2	LAST	245	25,3542	17657 0		CADR	GOODEND	
------	-----	---	------	-----	---------	---------	--	------	---------	--

2567	REF	118	LAST	567	25,3543	4 4755 0	-2	CS	ZEPD	RDBADENC WHEN NOT UNDER WAITLIST.
------	-----	-----	------	-----	---------	----------	----	----	------	-----------------------------------

2568	REF	3	LAST	567	25,3544	54 332 1		TS	RLPTAGN	
------	-----	---	------	-----	---------	----------	--	----	---------	--

2569	REF	38	LAST	567	25,3545	3 4752 0	REPADENC	CAF	TWC	
------	-----	----	------	-----	---------	----------	----------	-----	-----	--

2570	REF	38	LAST	567	25,3546	0 4635 0		TC	PCSTJUMP	
------	-----	----	------	-----	---------	----------	--	----	----------	--

2571	REF	1			25,3547	17654 0		CADR	BADENC	
------	-----	---	--	--	---------	---------	--	------	--------	--

2572	REF	18	LAST	511	6250		EIN3	EQUALS THREE		
------	-----	----	------	-----	------	--	------	--------------	--	--

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R2573 PROGRAM NAME_ LPS20.1 VECTOR EXTRAPCLATION AND LCS COMPUTATION
R2574 MOD. NO. 2 BY J.D. COYNE SRC DATE 12-7-66

R2575 FUNCTIONAL DESCRIPTION_

R2576 1) EXTRAPCLATE THE LEM AND CSM VECTORS IN ACCORDANCE WITH THE TIME REFERED TO IN CALLER + 1.
R2578 2) COMPUTES THE LCS VECTOR TO THE CSM, CONVERTS IT TO STABLE MEMBER COORDINATES AND STORES IT IN FRTARGET.
R2580 3) COMPUTES THE MAGNITUDE OF THE LCS VECTOR AND STORES IT IN MLCSV

R2581 CALLING SEQUENCE CALL
R2582 LPS20.1

R2583 SUBROUTINES CALLED_

R2584 LEMPREC,CSMPREC

R2585 NORMAL EXIT_ RETURN TO CALLER + 2

R2586 ERROR EXITS_ NONE

R2587 ALARMS_ NONE

R2588 OUTPLT_

R2589 LCS VECTOR (HALF UNIT) IN SM COORDINATES STORED IN FRTARGET
R2590 MAGNITUDE OF THE LCS VECTOR (METERS SCALED B-29) STORED IN MSLDV
R2591 RRNPSW CLEARED

R2592 INITIALIZED FRASEARLE

R2593 TDFC1 MUST CONTAIN THE TIME FOR EXTRAPCLATION
R2594 SEE ORBITAL INTEGRATION ROUTINE

R2595 DEPRIS_

R2596 MPAC DESTROYED BY THIS ROUTINE

2597		23,2337	BANK 23
2598	RFF 4 LAST 518	24,2000	SETLCC P215
2599		24,3255	BANK

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2600	REF	1			COUNT* #4/LPS20			
2601				24,3255	43020 1	LPS20.1	STG	BCFF
2602	REF	3	LAST	502	24,3256			LS21X
2603	REF	8	LAST	552	24,3257			LCSMFLG
2604	REF	1			24,3260			LMINT
2605				24,3261	77614 1		BON	
2606	REF	6	LAST	502	24,3262			SUPFLAG
2607	REF	1			24,3263			CSMINT
2608				24,3264	77624 1	LMINT	CALL	LEMCCNIC
2609	REF	3	LAST	489	24,3265			EXTRAPCLATE LEM
2610				24,3266	77775 1		VLOAD	
2611	REF	5	LAST	489	24,3267			RATT
2612	REF	2	LAST	502	24,3270		STCVL	LMFCS
2613	REF	1			24,3271			VATT
2614	REF	2	LAST	502	24,3272		STCDL	LMVFL
2615	REF	5	LAST	495	24,3273			TAT
2616	REF	16	LAST	520	24,3274		CSMINT	STCALL
2617	REF	2	LAST	240	24,3275			CSMCCNIC
2618				24,3276	52375 1		VLOAD	VSU
2619	REF	2	LAST	569	24,3277			VATT
2620	REF	3	LAST	569	24,3300			LMVFL
2621				24,3301	76521 0		MXV	VSL1
2622	REF	8	LAST	489	24,3302			REFSMAT
2623				24,3303	77776 1		EXIT	
2624	REF	6	LAST	554	24,3304		TC	KILLTASK
2625	REF	3	LAST	554	24,3305		CADP	DESLCSP +2
2626	REF	49	LAST	552	24,3306		TC	INTPRET
2627	REF	4	LAST	552	24,3307		STCVL	LCSVEL
2628	REF	6	LAST	569	24,3310			RATT
2629				24,3311	43051 1		VSU	BCFF
2630	REF	3	LAST	569	24,3312			LMFCS
2631	REF	4	LAST	504	24,3313			RADVZELG
2632	REF	1			24,3314			NOTSHIFT
2633				24,3315	77604 0		BCVB	
2634	REF	1			24,3316			TCDANZIG
2635				24,3317	77661 0		VSI	
2636				24,3320	20212 1			SC
2637				24,3321	41056 1	NOTSHIFT	UNIT	BCVB
2638	REF	1			24,3322			526ALARM
2639				24,3323	76521 0		MXV	VSL1
2640	REF	9	LAST	569	24,3324			REFSMAT
2641	REF	10	LAST	553	24,3325		STCDL	RRTARGET
2642				24,3326	00045 0			360
2643	REF	4	LAST	554	24,3327		STCRE	MLCSV
2644				24,3330	77614 1		CLREC	
2645	REF	5	LAST	552	24,3331			PRNBSW
2646	REF	4	LAST	569	24,3332			LS21X

LSCMFLG = 0 MEANS NOT CALLED BY R21
 SC CALL LEMCCNIC TO GET LM STATE
 IF IN R21 AND ON LUNAR SURFACE
 DON'T CALL LEMCCNIC
 EXTRAPCLATE LEM
 SAVE LM POSITION B-29
 SAVE LM VELOCITY B-7
 EXTRAPCLATE CSM
 COMPUTE RELATIVE VELOCITY V(CSM) - V(LM)
 KILL THE TASK WHICH CALLS CODES SINCE
 STORING INTO ERASEABLES USES
 IF OVERFLOW, RANGE MUST BE GREATER
 THAN 400 N. M.
 CONVERT TO STABLE MEMBER
 SAVE MAGNITUDE OF LCS VECTOR FOR
 VELOCITY CORRECTION IN DESIGNATE

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R2647 PROGRAM NAME_ LPS20.2 400 NM RANGE CHECK
 R2648 MOD. NO. 2 BY J.P. CCYAN SRC DATE 12-7-66

R2649 FUNCTIONAL DESCRIPTION_

R2650 COMPARES THE MAGNITUDE OF THE LCS VECTOR TO 400 NM

R2651 CALLING SEQUENCE CALL
 R2652 LPS20.2

R2653 SUBROUTINES CALLED_ NONE

R2654 NORMAL EXIT _ RETURN TO CALLER +1, MPAC EQ 0 (RANGE 400NM OR LESS.)

R2655 ERROR EXITS _ RETURN TO CALLER +1, MPAC EQ 1 (RANGE GREATER THAN 400NM)

R2656 ALARMS_ NONE

R2657 OUTPUT_ NONE

R2658 INITIALIZED SPASEFABLE_

R2659 PDI 360 MUST CONTAIN THE MAGNITUDE OF THE VECTOR
 R2660 DEGREE

R2661 MPAC DESTROYED BY THIS ROUTINE

2662 RFF 3 LAST 565 25,2100 SETLOC P20S1
 2663 25,3550 BANK
 2664 RFF 1 COUNT# 55/LPS20

2665				25,3550	45345 1	LPS20.2	DLOAD	DSU		
2666	RFF	5	LAST 565	25,3551	01767 0			MLCSV		MAGNITUDE OF LCS
2667	RFF	1		25,3552	12563 0			FHNM		OVER 400NM
2668				25,3553	77644 1		BPL			
2669	RFF	1		25,3554	52557 0			TCFAR		
2670				25,3555	43535 0		SLOAD	RVC		
2671	RFF	1		25,3556	06524 1			ZERO/SP		
2672				25,3557	42525 0	TCFAR	SLOAD	RVC		
2673	RFF	1		25,3558	12562 1			ONE/SP		
2674				25,3559	00001 0	CNE/SP	DFC	1		

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2675	25,3562	26467 0	FFNM	2DEC	740800 B-20	400 NAUTICAL MILES IN METERS E-20
2675	25,3562	00000 1				

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R2676 PROGRAM NAME: LRS22.1 (DATA READ SUBROUTINE 1)
R2677 MOD. NO.: 1 BY: P. VCLANTH SDC DATE: 11-15-66

R2678 FUNCTIONAL DESCRIPTION

R2679 1) READS PENETRIOUS RADAR RANGE AND RANGE-RATE, TRUNION AND SHAFT ANGLES, THREE CDU VALUES AND TIME. CONVERTS THIS
R2681 DATA AND LEAVES IT FOR THE MEASUREMENT INCORPORATION ROUTINE (LSP22.3). CHECKS FOR THE RR DATA GOOD DISCRETE, FOR
R2683 RR REPOSITION AND RR CDU FAIL

R2684 2) COMPARES RADAR LCS WITH LCS COMPUTED FROM STATE VECTORS TO SEE IF THEY ARE WITHIN THREE DEGREES

R2686 CALLING SEQUENCE: BANKCALL FOR LRS22.1

R2687 SUBROUTINES CALLED:

R2688 PPPDET LRS20.1
R2689 RRRANGE BANKCALL
R2690 RAESTALL CTRUCCIC
R2691 RRRR SMIB
R2692 NORMAL EXIT: RETURN TO CALLER+1 WITH MPAC SET TO 40

R2693 ERROR EXITS: RETURN TO CALLER+1 WITH ERROR CODE STORED IN MPAC AS FOLLOWS:

R2695 0001-ERROR EXIT 1-RR DATA NO GOOD (NO RR DATA GOOD DISCRETE OR RR CDU FAIL OR RR REPOSITION)
R2697 0002-ERROR EXIT 2-RR LCS NOT WITHIN THREE DEGREES OF LCS COMPUTED FROM STATE VECTORS

R2699 ALARMS: 521-COULD NOT READ RADAR DATA (RR DATA GOOD DISCRETE NOT PRESENT BEFORE AND AFTER READING THE RADAR)
R2701 (THIS ALARM IS ISSUED BY THE RADAREAD SUBROUTINE WHICH IS ENTERED FROM A RADARUT)

R2703 OUTPUT: RPLCSVEC- THE RR LINE-OF-SIGHT VECTOR (USED BY LRS22.2)-A HALF-UNIT VECTOR
R2705 RM- THE RR RANGE READING (TO THE CSN) OF, IN METERS SCALED B-29 (USED BY LRS22.2 AND LRS22.3)

R2707 ALL OF THE FOLLOWING OUTPUTS ARE USED BY LRS22.3:

R2708 RRRATE- THE RR RANGE-RATE READING, RP, IN METERS PER CENTISECOND, SCALED B-7
R2710 PTRUN-RR TRUNION ANGLE, DP, IN REVOLUTIONS, SCALED B0
R2711 PRSHAFT-RR SHAFT ANGLE, CP, IN REVOLUTIONS, SCALED B0
R2712 AIG, AMG, ACG- THE CDU ANGLES, THREE SP WORDS
R2713 RKTIME- THE TIME OF THE RR READING, DP, IN CENTISECONDS

R2714 FRASABLE INITIALIZATION REQUIRED:

R2715 RNRAD, THE RADAR READ COUNTER FROM WHICH IS OBTAINED:

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R2716 1)RR RANGE SCALED 9.38 FT. PER BIT ON THE LOW SCALE AND 75.04 FT. PER BIT ON THE HIGH SCALE
 P2718 2)RR RANGE RATE SCALED .6278 FT./SEC. PER BIT

R2719 THE CDU ANGLES FROM CDUX,CDUY,CDUZ AND TIME1 AND TIME2

R2720 DEBRIS: LRS22.1X,A,I,C,PUSHLIST

2721					32,2366			BANK	32	
2722	REF	2	LAST	41	32,2370			SFTLCC	LRS22	
2723					32,2366			RANK		
2724	REF	2	LAST	41	41:	4	4*	CCUNT#	\$/LRS22	
2725	REF	7	LAST	545	32,2366	3 4645	1	LRS22.1	TC	MAKECADR
2726	REF	2	LAST	546	32,2367	55 737	1	TS	LRS22.1X	
2727	REF	62	LAST	553	32,2370	0 5516	0	TC	DOWNFLAG	
2728	REF	2	LAST	561	32,2371	00120	1	ADPES	RNCSCFLG	
2729					32,2372	0 0004	0	INHINT		
2730	REF	29	LAST	561	32,2373	3 4751	0	CAF	BIT3	
2731					32,2374	0 0006	1	EXTEND		GET RR RANGE SCALE
2732	REF	19	LAST	565	32,2375	02 033	1	RAND	CHAN33	FROM CHANNEL 33 BIT 3
2733	REF	90	LAST	563	32,2376	54 001	1	TS	L	
2734	REF	1			32,2377	4 4751	1	CS	RRHSBIT	
2735	REF	94	LAST	567	32,2400	7 0110	0	MASK	RADMODES	
2736	REF	91	LAST	573	32,2401	6 0001	0	AD	L	
2737	REF	95	LAST	573	32,2402	54 110	0	TS	RADMODES	
2738					32,2403	0 0003	1	RELINT		
2739	REF	149	LAST	554	32,2404	0 4616	1	READRECT	BANKCALL	
2740	REF	4	LAST	520	32,2405	53112	0	CADR	RRRDET	RFAC RANGE-RATE (CNE SAMPLE)
2741	REF	150	LAST	573	32,2406	0 4616	1	TC	BANKCALL	
2742	REF	10	LAST	520	32,2407	17706	0	CADR	RATSTALL	WAIT FOR DATA READ COMPLETION
2743	REF	1			32,2410	1 2543	0	TCF	FRFXITI	COULD NOT READ RADAR-ERROR EXIT 1
2744					32,2411	0 0004	0	INHINT		NO INTERRUPTS WHILE READING TIME AND CDU
2745	REF	6	LAST	556	32,2412	53 1105	0	DXCH	TIMEHOLD	SET MARK TIME EQUAL TO THE MID-POINT
2746	REF	247	LAST	553	32,2413	52 162	0	EXCF	MPAC +5	TEMP BUFFER FOR DOWNLINK
2747	REF	6	LAST	561	32,2414	53 1111	1	DXCH	SAMPLESUM	SAVE RANGE-RATE READING
2748	REF	3	LAST	147	32,2415	53 1747	0	DXCH	PROTMSAV	
2749					32,2416	0 0005	1	EXTEND		
2750	REF	2	LAST	254	32,2417	3 0034	0	DCA	CDUY	SAVE CDU ANGLES
2751	REF	248	LAST	573	32,2420	52 160	1	EXCF	MPAC +3	TEMP BUFFER FOR DOWNLINK
2752	REF	10	LAST	556	32,2421	3 0032	0	CA	CDUX	
2753	REF	249	LAST	573	32,2422	54 156	1	TS	MPAC +2	TEMP BUFFER FOR DOWNLINK
2754					32,2423	0 0006	1	EXTEND		
2755	REF	15	LAST	556	32,2424	3 0025	0	DCA	TIME2	SAVE TIME
2756	REF	251	LAST	573	32,2425	52 155	1	DXCH	MPAC	SAVE TIME OF CDY READINGS IN MPAC
2757					32,2426	0 0006	1	EXTEND		
2758	REF	9	LAST	550	32,2427	3 0036	1	DCA	CDUT	SAVE TRUNION AND SHAFT ANGLES FOR RRNE
2759	REF	17	LAST	552	32,2430	53 1107	1	EXCF	TANG	

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2760				32,2431	C 0003	I	RELINT		
2761	REF	151	LAST	573	32,2432	J 4616	1	TC	BANKCALL
2762	REF	3	LAST	520	32,2433	53114	0	CADR	RRRANGE
									READ RR RANGE (ONE SAMPLE)
2763	REF	152	LAST	574	32,2434	0 4616	1	TC	PANKCALL
2764	REF	11	LAST	573	32,2435	17716	0	CADR	RADSTALL
2765	REF	1			32,2436	C 2537	1	TC	CHERR
									WAIT FOR READ COMPLETE
2766					32,2437	0 0014	0		CHECK FOR ERRORS DURING READ
27665					32,2440	0 0006	1	INHINT	COPY CYCLE FOR MARK DATA ON DOWNLINK
								EXTEND	
2767	REF	6	LAST	557	32,2441	3 1331	1	DCA	DARRANGE
									RANGE, RANGE RATE (RAW DATA)
2768	REF	3	LAST	200	32,2442	53'761	1	DXCH	RANGRODT
2769	REF	251	LAST	573	32,2443	52 162	0	DXCH	MPAC +5
2770	REF	5	LAST	202	32,2444	53'755	0	DXCH	MARKTIME
									MARK TIME
2771	REF	252	LAST	574	32,2445	52 161	1	DXCH	MPAC +3
2772	REF	3	LAST	202	32,2446	53'460	0	DXCH	AIG
									CCUY, CCLZ
2773					32,2447	0 0006	1	EXTEND	
2774	REF	18	LAST	573	32,2450	3 1107	0	DCA	TANG
									RESERVE TANG
2775	REF	7	LAST	545	32,2451	53'753	0	DXCH	TANGNB
									TRUNNION AND SHAFT ANGLES
2776	REF	253	LAST	574	32,2452	3 0156	0	CA	MRAC +2
2777	REF	3	LAST	202	32,2453	55'461	1	TS	ACC
									CCUX
2778	REF	50	LAST	569	32,2454	0 6042	1	TC	INTRRET
2779					32,2455	14025	0	STOCL	200
									SAVE TIME OF CDU READINGS IN 200
2780	REF	4	LAST	573	32,2456	03747	0		RECTMSAV
									CONVERT RECT UNITS AND SCALING
2781					32,2457	57261	0	SL	DMPR
									START WITH READING SCALED E-28, -.6278
2782					32,2460	20217	1		140
									FT./SECOND PER BIT
2783	REF	1			32,2461	24002	0		RECTCNV
									END WITH METERS/CENTISECOND, E-7
2784	REF	2	LAST	147	32,2462	03751	1	STORE	RDOTM
2785					32,2463	47135	0	SLCAD	RTB
									GET TRUNNION ANGLE
2786	REF	19	LAST	574	32,2464	01107	0		TANG
									CONVERT TO DP ONES COMP. IN REVOLUTIONS
2787	REF	13	LAST	550	32,2465	21577	1		CDULOGIC
									AND SAVE FOR TMI ROUTINE (LSR22.3)
2788	REF	2	LAST	147	32,2466	03734	1	STORE	RRTRCN
2789					32,2467	47135	0	SLCAD	RTB
									GET TRUNNION ANGLE
2790	REF	20	LAST	574	32,2470	01110	0		TANG +1
									DATA FOR SHAFT ANGLE
2791	REF	14	LAST	574	32,2471	21577	1		CDULCEIC
2792	REF	2	LAST	147	32,2472	17736	0	STOCL	RRSHAFT
									SAMRI SUM
2793	REF	7	LAST	573	32,2473	01101	0		SL2R
2794					32,2474	66405	0	DMP	SL2R
									CONVERT UNITS AND SCALING OF RANGE
2795	REF	1			32,2475	24004	0		RANGCCNV
									PER BIT, END WITH METERS, SCALED -29
2797	REF	4	LAST	202	32,2476	37757	0	STCALL	RM
2798	REF	2	LAST	545	32,2477	46041	0		RRAB
									COMPUTE RADAR LOS USING RRAB
2799	REF	3	LAST	147	32,2500	17741	0	STOCL	RRECPST
									AND SAVE
2800					32,2501	00025	0		200
2801	REF	17	LAST	569	32,2502	34041	0	STCALL	TDEC1
									GET STATE VECTOR LOS AT TIME OF CCL READ
2802	REF	5	LAST	520	32,2503	51255	1		LPS20.1
2803					32,2504	77776	1	EXIT	
2804	REF	4	LAST	574	32,2505	3 1457	0	CA	AIG
									STORE IML CDU ANGLES AT MARKTIME
2805	REF	10	LAST	480	32,2506	54 765	1	TS	CDUSPCT
									IN CDUSPCT FOR TRC*SMNE
2806	REF	1			32,2507	3 1460	1	CA	ANG
2807	REF	11	LAST	574	32,2510	54 767	0	TS	CDUSPCT +2
2808	REF	4	LAST	574	32,2511	3 1461	0	CA	ACC
2809	REF	12	LAST	574	32,2512	54 771	1	TS	CDUSPOT +4

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2810	REF	51	LAST	574	32,2513	0 6042 1	TC	INTERP	
2811					32,2514	45175 0	VLOAD	CALL	LOAD VECTOR AND CALL TRANSFORMATION
2812	REF	11	LAST	569	32,2515	01101 0		RRTARGET	
2813	REF	1			32,2516	47652 1		TPG*SMAP	ROTATE LCS AT MARKTIME FROM SW TO NE.
2814					32,2517	77641 1	DOT		DOT WITH RADAR LCS TO GET ANGLE
2815	REF	4	LAST	574	32,2520	02741 0		RRECSIT	
2816					32,2521	65552 0	SL1	ACCS	BETWEEN THEM
2817	REF	22	LAST	450	32,2522	01045 1	STORE	DSPTM1	STORE FOR POSSIBLE DISPLAY
2818					32,2523	50025 0	DSU	BMN	IS IT LESS THAN 3 DEGREES
2819	REF	1			32,2524	24547 1		THREDEG	
2820	REF	1			32,2525	64532 1		NCPMEXIT	YES-NORMAL EXIT
2821					32,2526	77776 1	EXIT		ERROR EXIT 2
2822	REF	33	LAST	553	32,2527	3 4752 0	CAF	BIT2	SET ERROR CODE
2823	REF	254	LAST	574	32,2530	54 154 0	TS	MPAC	
2824	REF	1			32,2531	1 2535 1	TCF	OUT22.1	
2825					32,2532	77776 1	NCPMEXIT	EXIT	NORMAL EXIT-SET MPAC EQUAL ZERO
2826	REF	116	LAST	567	32,2533	3 4755 1	CAF	ZERC	
2827	REF	255	LAST	575	32,2534	54 154 0	TS	MPAC	
2828	REF	4	LAST	572	32,2535	31 737 0	CLT22.1	CAF	LRS22.1X
2829	REF	10	LAST	543	32,2536	0 4640 1	TC	BANKJUMP	EXIT FROM LRS22.1
2830	REF	17	LAST	560	32,2537	30 101 1	CFEXERR	CAE	FLAGWRDS
2831	REF	1			32,2540	7 4742 0		MASK	PAGSCEIT
2832	REF	204	LAST	567	32,2541	10 000 0	CCS	A	CHECK IF RANGE SCALE CHANGED
2833	REF	1			32,2542	1 2404 1	TCF	REACRDOT	YES-TAKE ANOTHER READING
2834	REF	32	LAST	560	32,2543	3 4753 1	EREXIT1	CA	BIT1
2835	REF	256	LAST	575	32,2544	54 154 0	TS	MPAC	SET ERROR CODE
2836	REF	2	LAST	575	32,2545	0 2535 0	TC	OUT22.1	
2837					32,2546	00210 1	THREDEG	2DEC	.008333333
2837					32,2547	21042 1			THREE DEGREES, SCALED REVS, 60
2838	REF	12	LAST	575	1120		RRLOSVEC		EQUALS RETARGET

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P2835 PROGRAM NAME - LRS22.2 (DATA READ SUBROUTINE 2)

R2840 MOD. NO. : 1 BY: P VOLANTE SCC DATE 4-11-67

R2841 FUNCTIONAL DESCRIPTION-

R2842 2) CHECKS IF THE RR LOS (I.E. THE RADAR BORESIGHT VECTOR) IS WITHIN 30 DEGREES OF THE LM +Z AXIS

R2844 CALLING SEQUENCE- BANKCALL FOR LRS22.2

R2845 SUBROUTINES CALLED: G+N,AUTO SFTMAXDE

R2846 NORMAL EXIT - RETURN TO CALLER WITH MPAC SET TO +0 (VIA SWRETURN)

R2847 ERROR EXIT - RETURN TO CALLER WITH MPAC SET TO 00001 -RADAR LOS NOT WITHIN 30 DEGREES OF LM +Z AXIS

P2849 ALARMS - NONE

IN THE AUTO MODE

R2851 EPASAELE INITIALIZATION REQUIRED -

R2852 RRLOSVEC - THE RR LINE-OF-SIGHT VECTOR-A HALF UNIT VECTOR COMPUTED BY LRS22.1

R2854 RM - RR RANGE, METERS R-29, FROM LRS22.1

R2855 BIT 14 CHANNEL 31 -INDICATES AUTCPILCT IS IN AUTO MODE

R2856 DEPRIS - A,L,Q,MPAC -PUSHLIST AND PUSHLOC ARE NOT CHANGED BY THIS ROUTINE

2858 REF 5 LAST 568 24,2100 SFTLOC P20S

2859 24,3333

BANK

2860 REF 8 LAST 573 24,3333 0 4645 1 LRS22.2 TC MAKECADR

2861 REF 5 LAST 575 24,3334 551737 1 TS LRS22.1X

2862 REF 52 LAST 575 24,3335 0 6342 1 TC INTERPRET

A2863 2864 24,3336 65545 0 30DEGCHK DLOC ACOS CHECK IF RR LOS IS WITHIN 30 DEG OF THE SPACECRAFT +Z AXIS

A2866 2865 REF 5 LAST 575 24,3337 03745 1 RRRCSIT +4

A2867 2866 24,3337 03745 1 RRRCSIT +4 BY TAKING ARCCOS OF Z-COMP. OF THE RR LOS VECTOR, A HALF UNIT VECTOR IN NAV BASE AXES)

2868 2868 24,3340 50725 0 DSL RM

2869 REF 1 24,3341 11355 1 30DEG

2870 REF 1 24,3342 51347 0 CKEXIT

2871 2871 24,3343 77776 1 EXIT

2872 REF 33 LAST 575 24,3344 3 4753 1 CAF BIT1

2873 REF 257 LAST 575 24,3345 54 154 0 TS MPAC

2874 REF 1 24,3346 1 3352 1 TCF FLT22.2

2875 2875 24,3347 77775 1 CKEXIT EXIT

NORMAL EXIT-WITHIN 30 DEG.
ERROR EXIT-NOT WITHIN 30 DEG.
SET ERROR CODE IN MPAC

NORMAL EXIT-SET MPAC = ZERO

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2876	REF	121	LAST	575	24,3357	3 4755 1	CAF	ZERC
2877	REF	258	LAST	576	24,3351	54 154 0	TS	MPAC
2878	REF	6	LAST	576	24,3352	31 1737 0	CAF	LRS22.1X
2879	REF	11	LAST	575	24,3353	0 4640 1	TC	BANKJUMP

2880					24,3354	02525 1	30DFC	2DFC	.083333333	THIRTY DEGREES, SCALED REVS, B0
2881					24,3355	12525 0				

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P2881 PROGRAM NAME - LSR22.3

P2883 MOD. NO 3

P2885 MOD. BY - CANFORTH

P2887

P2889 FUNCTIONAL DESCRIPTION

DATE - 29 MAY 1967

LOG SECTION - P20-25

ASSEMBLY LEMP20S REV 10

R2889 THIS ROUTINE COMPUTES THE P-VECTORS AND DELTA C FOR EACH OF THE QUANTITIES MEASURED BY THE RENDEZVOUS
 R2891 RADAR. (RANGE, RANGE RATE, SHAFT AND TRUNNION ANGLES). THE ROUTINE CALLS THE INCCRP1 AND INCCRP2 ROUTINES
 R2893 WHICH COMPUTE THE DEVIATIONS AND CORRECT THE STATE VECTOR.

R2894 CALLING SEQUENCE

R2895 THIS ROUTINE IS PART OF P20 RENDEZVOUS NAVIGATION FOR THE LM COMPUTER ONLY. THE ROUTINE IS ENTERED FROM

R2897 R22LEM ONLY AND RETURNS DIRECTLY TO R22LEM FOLLOWING SUCCESSFUL INCORPORATION OF MEASURED DATA. IF THE

R2899 COMPLETED STATE VECTOR DEVIATIONS EXCEED THE MAXIMUM PERMITTED. THE ROUTINE RETURNS TO R22LEM TO DISPLAY

R2901 THE DEVIATIONS. IF THE ASTRONAUT ACCEPTS THE DATA R22LEM RETURNS TO LSR22.3 TO INCORPORATE THE

R2903 DEVIATIONS INTO THE STATE VECTOR. IF THE ASTRONAUT REJECTS THE DEVIATIONS, NO MORE MEASUREMENTS ARE

R2905 PROCESSED FOR THIS MARK, I.E., R22LEM GETS THE NEXT MARK.

R2906

R2907 SUBROUTINES CALLED

R2908 WLIMIT LGCLPDT INTEGRV INCCRP1 AECTAN

R2909 GETLLC RARARANG INCCRP2 NBSV TATSTALL

R2910

R2911 OUTPLT

R2912 CORRECTED LM OR CSM STATE VECTOR (PERMANENT)

R2913 NUMBER OF MARKS INCORPORATED IN MARKCTR

R2914 MAGNITUDE OF POSITION DEVIATION (FOR DISPLAY) IN R22DISP METERS B-29

R2915 MAGNITUDE OF VELOCITY DEVIATION (FOR DISPLAY) IN R22DISP +2 M/CSEC B-7

R2916 UPDATED W-MATRIX

R2917

R2918 ERASABLE INITIALIZATION REQUIRED

R2919 LM AND CSM STATE VECTORS

R2920 W-MATRIX

R2921 MARK TIME IN MKTIME

R2922 RADAR RANGE IN RM METERS B-29

R2923 RANGE RATE IN RDM METERS/SECS B-7

R2924 SHAFT ANGLE IN RS SHAFT REVS. B7

R2925 TRUNNION ANGLE IN RT RLN REVS. B0

R2926 GIMBAL ANGLES INNER IN AIC

R2927 MIDDLE IN ANG

R2928 OUTER IN ANG

R2929 REFSMAY

R2930 RENDEWFLG

R2931 NCANCFLG

R2932 VELLPFLG

R2933 EEPDIS

R2934 FLSHLIST--ALL

R2935 MX, MY, MZ (VECTORS)

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R2936 LLO, RXZ, SINTE-ETA, LCRET, PCRET, PVECTOR, W. IND, X78T

2937				13,2217		BANK	13	
2938	REF	1		26,2110		SETLCC	P2OS3	
2939				26,2416		BANK		
2940	REF	29	LAST	565	F7,1456	EPANK=	LCSCCUNT	
2941	REF	1				COUNT#	\$1/LSP22	
2942				26,2416	77624 1	CALL	LSR22.3	
2943	REF	7	LAST	508	26,2417		GRP2PC	
2944				26,2421	11226 1	SET		
2945	REF	7	LAST	565	26,2421	PON	SET	
2946	REF	1		26,2422	04307 1		SUPFFLAG	APE WE CN LUNAR SURFACE
2947	REF	1		26,2422	55200 0		LSP22.4	YES
2948	REF	1		26,2422	02466 1		DMENFLG	
2949	REF	6	LAST	502	26,2424	BCFF	CALL	
2950	REF	1		26,2425	45014 0		VEHUPFLG	
2951	REF	11	LAST	502	26,2426		DOLEM	
2952	REF	11	LAST	502	26,2427		INTSTALL	
2953	REF	10	LAST	502	26,2430	CLFAR	CALL	LM PRECISION INTEGRATION
2954	REF	4	LAST	502	26,2431		VINTFLAG	
2955				26,2432	01674 0		SETIFLGS	
2956	REF	1		26,2433	26645 1	CALL		
2957				26,2434	77624 1		INTGRCAL	
2958	REF	8	LAST	579	26,2435	CALL		
2959				26,2436	77624 1		GRP2PC	
2960	REF	12	LAST	579	26,2437	CALL		
2961				26,2440	11226 1		INTSTALL	
2962	REF	7	LAST	502	26,2441	CLFAR	BCFF	
2963	REF	5	LAST	502	26,2442		DIMOFLEG	
2964	REF	1		26,2443	01676 1		RENDWFLG	
2965				26,2444	02756 1		ACTWCSM	
2966	REF	8	LAST	579	54450 1	SET	SET	CSM WITH W-MATRIX INTEGRATION
2967	REF	5	LAST	502	26,2445		DIMOFLEG	
2968				26,2446	43014 0	NOTWCSM	SET	
2969	REF	11	LAST	579	26,2447		D6C09FLG	
2970	REF	3	LAST	496	26,2450		CLEAP	
2971				26,2451	01474 1	SET	VINTFLAG	
2972	REF	1		26,2452	01672 1		INTYFLEG	
2973	REF	2	LAST	579	26,2453		CALL	
2974				26,2454	45014 0		STATEFLG	
2975	REF	1		26,2455	01472 1		INTGRCAL	
2976				26,2456	55242 0	CDTC		
2977	REF	13	LAST	579	26,2457		MARKTEST	
2978	REF	12	LAST	579	26,2460	DOLEM	CALL	
2979	REF	5	LAST	579	26,2461		INTSTALL	
2980	REF	5	LAST	579	26,2462	SET	CALL	
2981				26,2463	45014 0		VINTFLAG	
2982	REF	3	LAST	579	01474 1		SETIFLGS	
				26,2465	26645 1	CALL		
				26,2466	77624 1		INTGRCAL	

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2982					26,2467	77624 1	CALL		
2984	REF	9	LAST	579	26,2470	11226 1		GRP2PC	
2985					26,2471	77624 1	CALL		
2986	REF	14	LAST	579	26,2472	27412 0		INTSTALL	
2987					26,2473	43014 0	CLEAR	BCFF	
2988	PEF	9	LAST	579	26,2474	01676 1		DIMDFLAG	
2989	REF	6	LAST	579	26,2475	02756 1		RENDWFLG	
2990	REF	1			26,2476	54512 1		NCTWLEM	
2991					26,2477	43014 0	SET	SET	LM WITH W-MATRIX INTEGRATION
2992	REF	10	LAST	580	26,2500	01476 0		DIMDFLAG	
2993	REF	6	LAST	579	26,2501	01475 0		D6CR9FLG	
2994					26,2502	43014 0	NOTWLEM CLEAR	CLEAR	
2995	REF	4	LAST	579	26,2503	01673 1		INTYFFLG	
2996	REF	13	LAST	579	26,2504	01674 0		VINTEFLAG	
2997					26,2505	45014 0	SET	CALL	
2998	REF	2	LAST	579	26,2506	01472 1		STATFFLG	
2999	REF	4	LAST	579	26,2507	55242 0		INTGRCAL	
3000					26,2510	45014 0	MARKTEST BON	CALL	HAS W-MATRIX BEEN INVALIDATED
3001	REF	7	LAST	580	26,2511	02716 0		FENDWFLG	HAS W-MATRIX BEEN INVALIDATED
3002	REF	1			26,2512	54514 0		RANGERC	
3003	REF	1			26,2513	55251 1		WLINIT	YES-REINITIALIZE
3004					26,2514	77414 0	PANGREQ BON	EXIT	CAN'T CALL R65 IF ON SURFACE
3005	REF	8	LAST	579	26,2515	04307 1		SLRFFLAG	
3006	REF	1			26,2516	54524 0		PANGREQ1	
3007	REF	121	LAST	577	26,2517	3 4755 1	CA	ZERO	
3008	REF	5	LAST	521	26,2520	551745 1	TS	R65CNTR	
3009	REF	152	LAST	574	26,2521	0 4616 1	TC	BANKCALL	
3010	REF	3	LAST	509	26,2522	46123 0	CADR	R65LEM	
3011	REF	52	LAST	576	26,2523	0 6042 1	TC	INTPRET	
3012					26,2524	43174 1	PANGREQ1 AXT,2	BON	CLEAR X2
3013					26,2525	0 0000 1		0	
3014	REF	2	LAST	37	26,2526	04304 1		LMCONFLG	IS MCON SPHERE OF INFLUENCE
3015	REF	1			26,2527	54532 1		SETX2	YES. STOPE ZERO IN SCALSHFT REGISTER
3016					26,2530	77714 0	INCR,2		
3017					26,2531	00202 0		2	
3018					26,2532	45134 0	SETX2 SXA,2	CALL	
3019	PEF	2	LAST	146	26,2533	02720 1		SCALSHFT	C-MCON. 2-EARTH
3020	REF	10	LAST	580	26,2534	11226 1		GRP2PC	
3021					26,2535	66170 1	AXT,1	SXA,1	STOPE RANGE CODE (1) FOR R3 IN ACUN 49
3022					26,2536	00001 0		1	
3023	REF	2	LAST	315	26,2537	01356 0		WHCHRFRD	
3024					26,2540	54335 0	SLOAD	SR	GET SINGLE PRECISION PVARMIN (B-12)
3025	REF	1			26,2541	01775 0		PVARMIN	SHIFT TO TRIPLE PRECISION (B-40)
3026					26,2542	20635 0		2ED	
3027					26,2543	77634 0	RTH		
3028	REF	1			26,2544	21634 0		TFMODE	AND SAVE IN 200
3029					26,2545	00025 0	STORE	200	
3030					26,2546	77624 1	CALL		BEGIN COMPUTING THE B-VECTORS, DELTAG
3031	REF	1			26,2547	55333 1		GETULC	B-VECTORS FOR RANGE
3032					26,2550	57414 1	BON	VCOMP	B0, COMP. IF LM BEING CORRECTED

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3033	REF	7	LAST	579	26,2551	00777 1		VEHUPFLG		
3034					26,2552	54553 0		+1		
3035	REF	2	LAST	146	26,2552	27525 0	STCVL	BVECTCP		
3036	REF	2	LAST	37	26,2554	16524 1		ZEROVECS		
3037	REF	3	LAST	581	26,2555	13533 1	STORE	BVECTCR +6	P1	
3038	REF	4	LAST	581	26,2556	17541 1	STOCL	BVECTCR +12C	E2	
3039					26,2557	00045 0		36D		
3040					26,2561	44257 1	SRR*	RCSIJ		
3041					26,2561	56174 0		2,2		SHIFT FROM EARTH/MOON SPHERE TO P-29
3042	REF	5	LAST	574	26,2562	13757 1		RM		RM - (MAGNITUDE RCSN-RLM)
3043					26,2563	77657 0	SLP*			
3044					26,2564	56574 1		2,2		SHIFT TO EARTH/MOON SPHERE
3045	REF	2	LAST	146	26,2565	17547 1	STOCL	DELTAQ		EARTH B-29. MOON B-27
3046					26,2566	00045 0		36D		RLC E-29/P-27
3047					26,2567	63501 0	NORM	DSC		NORMALIZE AND SQUARE
3048	REF	3	LAST	388	26,2570	00047 1		X1		
3049					26,2571	53605 1	RMP	SR*		
3050	REF	1			26,2572	01771 1		RANGEVAR		MULTIPLY BY RANGEVAR(B12) THEN
3051					26,2573	20577 0		" -2,1		UNNORMALIZE
3052					26,2574	53657 0	SR*	SR*		
3053					26,2575	20611 1		0,1		
3054					26,2576	57176 0		0,2		
3055					26,2577	47057 0	SR*	RTB		
3056					26,2600	57176 0		0,2		
3057	REF	2	LAST	580	26,2601	21634 0		TFACDE		
3058	REF	2	LAST	127	26,2602	02707 0	STORE	VARIANCE	B-40	
3059					26,2603	76276 0	CCCMF	TAC		
3060					26,2604	00025 0		20D	E-40	
3061					26,2605	72240 1	BMN	TLOAD		
3062	REF	1			26,2606	54611 0		GCK		
3063					26,2607	00025 0		20D	E-40	
3064	REF	3	LAST	581	26,2610	02707 0	STORE	VARIANCE		
3065					26,2611	77624 1	GCK	CALL		
3066	REF	1			26,2612	55471 1		LCUPDTE		
3067					26,2613	45131 0	SSF	CALL		
3068	REF	3	LAST	580	26,2614	01257 1		WHCHREAD		
3069					26,2615	00002 0	DEC	2		STORE R-RATE CODE (2) FOR P3 IN ACUM 49
3070	REF	11	LAST	580	26,2616	11226 1		GRP2PC		
3071					26,2617	77624 1	CALL			B-VECTCP, DELTAQ FOR RANGE RATE
3072	REF	2	LAST	580	26,2620	55333 1		GETULC		
3073					26,2621	53725 1	FDL	SR*		GFT RLC SCALED B-29/B-27
3074					26,2622	00045 0		36D		AND SHIFT TO B-23
3075					26,2623	57202 0		" -4,2		
3076					26,2624	24045 0	STOVL	36D		THEN STORE BACK IN 36C
3077					26,2625	57414 1	BON	VCOMP		B1, COMP. IF LM BEING CORRECTED
3078	REF	9	LAST	581	26,2626	00767 1		VEHUPFLG		
3079					26,2627	54630 0		+1		
3080					26,2630	77761 1	VXSC			
3081					26,2631	00045 0		36D		E1 = RLC (B-24/P-22)

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3082	REF	5	LAST	581	26,2632	27533 1	STCVL	BVECTOR +6	
3083	REF	1			26,2633	01653 0		NLVLEM	
3084					26,2634	53257 1	VSR*	VAD	
3085					26,2635	57170 0		6,2	SHIFT FOR EARTH/MOON SPHERE
3086	REF	2	LAST	502	26,2636	01667 1		VGVLEM	EARTH E-7, MOON E-5
3087					26,2637	53715 1	PDVL	VSR*	VL TO PD6
3088	REF	1			26,2640	01601 1		ALVCSM	
3089					26,2641	57170 0		6,2	SHIFT FOR EARTH/MOON SPHERE
3090					26,2642	52255 1	VAC	VSU	
3091	REF	1			26,2643	01615 1		VGVCSM	
3092					26,2644	50315 0	PDVL	DCT	VC - VL = VLC TC PD6
3093					26,2645	00111 0		0	
3094					26,2646	00007 0		6	
3095					26,2647	53616 1	PUSH	SRP*	RDCT E-8/B-6 TC PD12
3096					26,2650	56174 0		2,2	SHIFT FROM EARTH/MOON SPHERE TO B-8
3097					26,2651	57316 1	DSQ	DMPR	RDCT**2 E-16 X RATEVAR E12
3098	REF	1			26,2652	01773 0		RATEVAR	
3099	REF	4	LAST	581	26,2653	02707 0	STORE	VARIANCE	
3100					26,2654	54335 0	SLOAD	SR	
3101	REF	1			26,2655	01776 0		VVARMIN	GET SINGLE PRECISION VVARMIN (B+12)
3102					26,2656	20621 0		16D	SHIFT TC DE (E-4)
3103					26,2657	00031 0	STORE	24D	AND SAVE IN 24D
3104					26,2660	50025 0	ESU	BMM	IS MIN. VARIANCE > COMPLETED VARIANCE
3105	REF	5	LAST	582	26,2661	02707 0		VARIANCE	
3106	REF	1			26,2662	54666 0		VCK	ERANCH - NC
3107					26,2663	77745 1	CLCAD		YES - USE MINIMUM VARIANCE
3108					26,2664	00131 0		24D	
3109	REF	6	LAST	582	26,2665	02707 0	STORE	VARIANCE	
3110					26,2666	60545 0	CLCAD	SR2	RDCT(PD12) FROM E-8/B-6
3111					26,2667	53725 1	PDDL	SLR*	TC B-10/E-8
3112	REF	2	LAST	574	26,2670	03751 1		RDCTM	SHIFT TC EARTH/MOON SPHERE
3113					26,2671	56577 1		0 -1,2	E-7 TC P-10/B-8
3114					26,2672	77525 0	ESU		
3115					26,2673	77675 0	DMPR		
3116					26,2674	00045 0		36D	
3117	REF	3	LAST	581	26,2675	27547 1	STCVL	DELTA G	B-33
3118					26,2676	10001 0		0	NEW GET E)
3119					26,2677	47235 0	VXV	VXV	(LLC X VLC) X LLC
3120					26,2710	57414 1	BCN	VCOMP	BO, COMP. IF LM BEING CORRECTED
3121	REF	9	LAST	581	26,2711	00707 1		VEHLFFLG	
3122					26,2712	54713 1		+1	
3123					26,2713	77657 0	VSR*		
3124					26,2714	57207 1		1-2,2	SCALED B-5
3125	REF	6	LAST	582	26,2715	27525 0	STOVL	BVECTOR	
3126	REF	3	LAST	581	26,2716	06524 1		ZEROVCS	
3127					26,2717	00025 0	STORE	20D	ZERO CNT 20 TO 25 IN FLSHLIST
3128	REF	7	LAST	582	26,2710	27541 1	STCVL	BVECTOR +12C	
3129	REF	8	LAST	582	26,2711	02525 0		BVECTOR	
3130					26,2712	60246 1	ABVAL	NORM	LOAD BO, GET MAGNITUDE AND NORMALIZE
3131					26,2713	00025 0		20D	SHIFT COUNT IN 20D

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3132				26,2714	51575 1	VLOAD	ARVAL	
3133	REF	9	LAST	582	26,2715	03533 1	BVECTOR +6D	LOAD B1, GET MAGNITUDE AND NORMALIZE
3134					26,2716	71201 0	NORM	DLOAD
3135					26,2717	00727 1	22D	SHIFT COUNT IN 22D
3136					26,2720	00727 1	22D	FIND WHICH SHIFT IS SMALLER
3137					26,2721	50025 0	DSU	BRANCH- EQ HAS SMALLER SHIFT COUNT
3138					26,2722	00225 0	22D	
3139	REF	1			26,2723	54727 1	VCK1	
3140					26,2724	52150 1	LXA,1	GOTO
3141					26,2725	00026 0	22D	LOAD X2 WITH THE SMALLER SHIFT COUNT
3142	REF	1			26,2726	54731 0	VCK2	
3143					26,2727	77750 0	VCK1	LXA,1
3144					26,2730	00024 1	22D	
3145					26,2731	52775 1	VCK2	VLOAD
3146	REF	10	LAST	583	26,2732	03525 0		THEN ADJUST B0,B1,DELTAQ AND VARIANCE WITH THIS SHIFT COUNT
3147					26,2733	20201 0	0,1	
3148	REF	11	LAST	583	26,2734	27525 0	STOVL	BVECTOR
3149	REF	12	LAST	583	26,2735	03533 1		BVECTOR +6
3150					26,2736	77657 0	VSL*	
3151					26,2737	20201 0	0,1	
3152	REF	13	LAST	583	26,2740	17533 1	STOVL	BVECTOR +6
3153	REF	4	LAST	582	26,2741	02547 1		DELTAQ
3154					26,2742	77657 0	SL*	
3155					26,2743	20201 0	0,1	
3156	REF	5	LAST	583	26,2744	02547 1	STORE	DELTAQ
3157					26,2745	53745 1	DLOAD	SL*
3158					26,2746	00045 0		360
3159					26,2747	20200 1	0 -1,1	
3160					26,2750	41316 0	DSQ	DMP
3161	REF	7	LAST	582	26,2751	02707 0		VARIANCE
3162					26,2752	47012 1	SL4	RTP
3163	REF	2	LAST	581	26,2753	21634 0		TPMODE
3164	REF	9	LAST	583	26,2754	36707 1	STCALL	VARIANCE
3165	REF	2	LAST	581	26,2755	55401 1		LCUPCTE
3166					26,2756	77624 1	CALL	
3167	REF	12	LAST	581	26,2757	11226 1		GRP2PC
3168					26,2760	77414 0	BCN	EXIT
3169	REF	9	LAST	580	26,2761	04307 1		SURFFLAG
3170	REF	1			26,2762	55176 1		RFNDEND
3171	REF	5	LAST	574	26,2763	00000 0	FRANK=	AIG
3172	REF	1			26,2763	00000 0	CAF	AICRANK
3173	REF	12	LAST	458	26,2764	54006 0	TS	BRANK
3174	REF	6	LAST	582	26,2765	00000 0	CA	AIC
3175	REF	13	LAST	574	26,2766	54765 1	TS	CDUSPOT
3176	REF	2	LAST	574	26,2767	00000 0	CA	ANG
3177	REF	14	LAST	583	26,2770	54767 0	TS	CDUSPCT +2
3178	REF	5	LAST	574	26,2771	00000 0	CA	ACC
3179	REF	15	LAST	582	26,2772	54771 1	TS	CDLSPCT +4
3180	REF	54	LAST	580	26,2773	00042 1	TC	INTPRST

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3181					26,2774	45175 0	VICAD	CALL	
3182	REF	5	LAST	340	26,2775	06522 1		UNITX	
3183	REF	4	LAST	253	26,2776	47666 1		TRE*NBSM	
3184					26,2777	76505 0	VXM	VSL1	
3185	REF	10	LAST	569	26,3000	01734 0		REFSMMAT	
3186	REF	5	LAST	146	26,3001	27677 1	STCVL	MX	
3187	REF	3	LAST	301	26,3002	06520 0		UNITY	
3188					26,3003	77624 1	CALL		
3189	REF	2	LAST	552	26,3004	47675 0		*NBSM*	
3190					26,3005	76505 0	VXM	VSL1	
3191	REF	11	LAST	584	26,3006	01734 0		REFSMMAT	
3192	REF	2	LAST	146	26,3007	27705 0	STCVL	MY	
3193	REF	5	LAST	341	26,3010	76516 0		UNITZ	
3194					26,3011	77624 1	CALL		
3195	REF	3	LAST	584	26,3012	47675 0		*NBSM*	
3196					26,3013	76505 0	VXM	VSL1	
3197	REF	12	LAST	584	26,3014	01734 0		REFSMMAT	
3198	REF	2	LAST	146	26,3015	37713 0	SFAFTBQ STCALL	MZ	
3199	REF	1			26,3016	55361 0		RACARANE	
3200					26,3017	77231 0	SSP	VLOAD	STORE SHAFT CODE (3) FOR R3 IN NCLN 49
3201	REF	4	LAST	581	26,3020	01357 1		WHCHREAD	
3202					26,3021	00003 1	EEC	3	
3203	REF	2	LAST	146	26,3022	03724 0		ULC	
3204					26,3023	72441 0	DCT	SL1	
3205	REF	6	LAST	584	26,3024	02677 1		MX	
3206	REF	6	LAST	480	26,3025	24023 0	STCVL	SINTH	180
3207	REF	3	LAST	584	26,3026	03724 0		ULC	
3208					26,3027	72441 0	DCT	SL1	
3209	REF	3	LAST	584	26,3030	03713 1		MZ	
3210	REF	6	LAST	480	26,3031	34021 0	STCALL	CCSTH	160
3211	REF	3	LAST	480	26,3032	26510 1		ARCTAN	
3212					26,3033	41221 0	BDSU	DMP	
3213	REF	3	LAST	574	26,3034	03736 0		RRSHAFT	
3214	REF	1			26,3035	15441 1		2PI/8	
3215					26,3036	41472 0	SL3R	PUSH	
3216					26,3037	52545 1	ELCAD	SL3	
3217	REF	2	LAST	197	26,3040	01701 0		X785	
3218					26,3041	44257 1	SPR*	RDSU	SHIFT FROM -5/-3 TO R0
3219					26,3042	56176 1		0,2	
3220					26,3043	53605 1	DMP	SRP*	
3221	REF	2	LAST	146	26,3044	03722 0		RXZ	
3222					26,3045	21601 0		0,1	SHIFT TO EARTH/MCCN SPHERE
3223	REF	6	LAST	582	26,3046	27547 1	STCVL	DELTAG	EARTH B-29. MCCN B-27
3224	REF	4	LAST	584	26,3047	03724 0		ULC	
3225					26,3050	76435 1	VXV	VSL1	
3226	REF	3	LAST	584	26,3051	03705 0		MY	
3227					26,3052	77656 1	UNIT		
3228					26,3053	57414 1	BOFF	VCOMP	BO, COMP. IF CSM BEING CORRECTED
3229	REF	10	LAST	582	26,3054	00747 0		VEHUPFLG	
3230					26,3055	55056 1		+1	

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3231	REF	14	LAST	583	26,306	27525 0	STCVL	BVECTOR	
3232	REF	4	LAST	582	26,3057	26524 1		ZEROVECS	
3233	REF	15	LAST	585	26,3060	13533 1	STORE	BVECTOR +6	
3234	REF	16	LAST	585	26,3061	17541 1	STCDL	BVECTOR +120	
3235	REF	3	LAST	584	26,3062	17722 0		RXZ	
3236					26,3063	53657 0	SR*	SRR*	SHIFT FROM EARTH/MOON SPHERE TO B-25
3237					26,3064	20577 0		0 -2,1	
3238					26,3065	56176 1		0,2	
3239	REF	17	LAST	585	26,3066	03541 1	STORE	BVECTOR +120	
3240					26,3067	77735 0	SLCAD		
3241	REF	1			26,3070	12011 0		SHAFTVAR	
3242					26,3071	41215 1	DAD	DMP	
3243	REF	1			26,3072	15436 1		IMUVAR	RAC**2 E12
3244	REF	4	LAST	585	26,3073	03722 0		RXZ	
3245					26,3074	41257 1	SPR*	DMP	
3246					26,3075	21611 0		0,1	SHIFT TO EARTH/MOON SPHERE
3247	REF	5	LAST	585	26,3076	13722 0		RXZ	
3248					26,3077	53657 0	SP*	SRR*	
3249					26,3100	20577 0		0 -2,1	
3250					26,3101	57176 0		0,2	
3251					26,3102	47057 0	SR*	RTB	
3252					26,3103	57176 0		0,2	
3253	REF	4	LAST	583	26,3104	21634 0		TPNCEE	STORE VARIANCE TRIPLE PRECISION
3254	REF	9	LAST	583	26,3105	36707 1	STCALL	VARIANCE	B-40
3255	REF	2	LAST	583	26,3106	55401 1		LECUPOTE	
3256					26,3107	77624 1	CALL		
3257	REF	13	LAST	583	26,3110	11226 1		GPP2PC	
3258					26,3111	77624 1	TPUNBC	CALL	
3259	REF	2	LAST	584	26,3112	55361 0		RADAPANG	
3260					26,3113	77331 0	SSP	VLOAD	STORE TRUNNION CODE (4) FOR R3 IN M49
3261	REF	5	LAST	584	26,3114	01357 1		WFCHREAD	
3262					26,3115	00004 0	DEC	4	
3263	REF	5	LAST	584	26,3116	03724 0		ULC	
3264					26,3117	76435 1	VXV	VSL1	
3265	REF	4	LAST	584	26,3120	03725 0		MY	
3266					26,3121	76435 1	VXV	VSL1	(ULC X MY) X ULC
3267	REF	6	LAST	585	26,3122	03724 0		LLC	
3268					26,3123	57414 1	BOFF	VCOMP	B0, COMP. IF CSM BEING CORRECTED
3269	REF	11	LAST	584	26,3124	00747 0		VFPUPFLC	
3270					26,3125	55126 1		+1	
3271	REF	18	LAST	585	26,3126	27525 0	STCVL	BVECTOR	
3272	REF	5	LAST	585	26,3127	06524 1		ZEROVECS	
3273	REF	19	LAST	585	26,3130	03533 1	STORE	BVECTOR +6	
3274	REF	20	LAST	585	26,3131	17541 1	STCDL	BVECTOR +120	
3275	REF	6	LAST	585	26,3132	03722 0		RXZ	
3276					26,3133	53657 0	SR*	SRR*	SHIFT FROM EARTH/MOON SPHERE TO B-25
3277					26,3134	20577 0		0 -2,1	
3278					26,3135	56176 1		0,2	
3279	REF	21	LAST	585	26,3136	13543 0	STORE	BVECTOR +140	

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3280					26,3137	77735 0	SLCAD		
3281	REF	I			26,3140	12012 0		TRUNVAR	
3282					26,3141	41215 1	EAD	DMP	
3283	REF	2	LAST	585	26,3142	15436 1		IMLVAF	
3284	REF	7	LAST	585	26,3143	03722 0		RXZ	
3285					26,3144	41257 1	SRR*	DMP	
3286					26,3145	21501 0		0,1	SHIFT TO EARTH/MCCN SPHERE
3287	REF	8	LAST	586	26,3146	02722 0		PXZ	
3288					26,3147	52657 0	SR*	SR*	
3289					26,3150	20577 0		0 -2,1	
3290					26,3151	57176 0		0,2	
3291					26,3152	47057 0	SR*	RTB	
3292					26,3153	57176 0		0,2	
3293	REF	5	LAST	585	26,3154	21634 0		TRPCDE	STORE VARIANCE TRIPLE PRECISION
3294	REF	10	LAST	585	26,3155	16707 0	STOOL	VARIANCE	
3295	REF	2	LAST	147	26,3156	03732 1		SIN THETA	
3296					26,3157	44336 1	ASIN	BDSU	SIN THETA IN PE6
3297	REF	2	LAST	574	26,3160	03734 1		RRTRUN	
3298					26,3161	56405 0	DMP	SL3P	
3299	REF	2	LAST	584	26,3162	15441 1		2PT/8	
3300					26,3163	52525 1	PDEL	SL3	
3301	REF	3	LAST	584	26,3164	01702 1		X789 +2	
3302					26,3165	44257 1	SRR*	BDSU	SHIFT FROM -5/-3 TO B0
3303					26,3166	56176 1		0,2	
3304					26,3167	53605 1	DMP	SRR*	
3305	REF	9	LAST	586	26,3170	03722 0		RXZ	
3306					26,3171	21601 0		0,1	
3307	REF	7	LAST	584	26,3172	37547 0	STCALL	DELTAQ	EARTH B-29. MCCN B-27
3308	REF	4	LAST	585	26,3173	55401 1		LGCUPETE	
3309					26,3174	77624 1	CALL		
3310	REF	14	LAST	585	26,3175	11226 1		GRP2PC	
3311					26,3176	77650 1	RENDEND	GCTC	
3312	REF	1			26,3177	51562 0		R22LEMS3	

R3313 FUNCTIONAL DESCRIPTION

R3314 LSR22.4 IS THE ENTRY TO PERFORM LUNAR SURFACE NAVIGATION FOR THE LM

R3315 COMPUTER ONLY. THIS ROUTINE COMPUTES THE E-VECTORS AND DELTA Q FOR RANGE

R3316 AND RANGE RATE MEASURED BY THE RENDEZVOUS RADAR

R3317 SUBROUTINES CALLED

R3318 INSTALL LGCUPETE INCORP1 RE-TC-R

R3319 INTERV GETULC INCORP2

R3320 OUTPUT

R3321 CORRECTED CSM STATE VECTOR (PERMANENT)

R3322 NUMBER OF MARKS INCORPORATED IN MARKCTR

R3323 MAGNITUDE OF POSITION DEVIATION (FOR DISPLAY) IN P22DISP METERS B-29

R3324 MAGNITUDE OF VELOCITY DEVIATION (FOR DISPLAY) IN P22DISP +2 M/CSEC B-7

P3325 UPDATED W-MATRIX

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R3326 FRASABLE INITIALIZATION REQUIRED
 R3327 LM AND CSM STATE VECTORS
 R3328 W-MATRIX
 R3329 MARK TIME IN WKTIME
 R3330 RADAR RANGE IN NM METERS P-25
 R3331 RANGE RATE IN NM/CTN METERS/CSEC B-7
 R3332 VEHUPLOC

3333				26,3200	77624 I	LSR22.4	CALL		
3334	REF	1	LAST	580	26,3211	27412 C		INSTALL	
3335				26,3202	42014 C		SET	CLEAR	
3336	REF	3	LAST	580	26,3212	01472 I		STATEFLG	
3337	REF	14	LAST	580	26,3204	01674 C		VINTFLAG	CALL TO GET LM POS + VEL IN REF COORD.
3338				26,3215	77624 I		CALL		
3339	REF	5	LAST	580	26,3216	55242 C		INTERCAL	
3340				26,3207	77624 I		CALL		
3341	REF	15	LAST	586	26,3210	11226 I		GRP2PC	
3342				26,3211	45014 C		CLEAR	CALL	
3343	REF	2	LAST	579	26,3212	02666 C		DYENFLG	SET MATRIX SIZE TO 6X6 FOR INCRP
3344	REF	16	LAST	587	26,3213	27412 C		INSTALL	
3345				26,3214	46145 C		PLCAD	BHIZ	IS THIS FIRST TIME THROUGH
3346	REF	3	LAST	518	26,3215	03463 C		MARKCTR	
3347	REF	1			26,3216	55231 I		INITWMX6	YES. INITIALIZE 6X6 W-MATRIX
3348				26,3217	42014 C		CLEAR	SET	
3349	REF	7	LAST	580	26,3220	01675 I		DEORSFLG	
3350	REF	11	LAST	580	26,3221	01476 I		DIMOFLAG	
3351				26,3222	42014 C		SET	CLEAR	
3352	REF	15	LAST	587	26,3223	01474 I		VINTFLAG	
3353	REF	5	LAST	580	26,3224	01673 I		INTYPELG	
3354				26,3225	77624 I		CALL		
3355	REF	6	LAST	587	26,3226	55242 C		INTERCAL	
3356				26,3227	77650 I		GOTC		
3357	REF	2	LAST	580	26,3230	54514 C		RANGEBQ	
3358				26,3231	77624 I		INITWMX6	CALL	
3359	REF	2	LAST	580	26,3232	55251 I		WLINIT	INITIALIZE W-MATRIX
3360				26,3233	45014 C		SET	CALL	
3361	REF	16	LAST	587	26,3234	01474 I		VINTFLAG	
3362	REF	6	LAST	579	26,3235	26645 I		SETIFLG5	
3363				26,3236	77624 I		CALL		
3364	REF	7	LAST	587	26,3237	55242 C		INTERCAL	
3365				26,3240	77650 I		GOTC		
3366	REF	2	LAST	587	26,3241	54514 C		RANGEBQ	

R3367 THIS ROUTINE CLEARS REFINAL (CP) AND CALLS INTEGRV

3368				26,3242	71220 I	INTERCAL	STQ	DLOAD	
3369	REF	1			26,3243	03675 C		IGRET	
3370	REF	6	LAST	574	26,3244	03755 C		WKTIME	

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3371 RFF 18 LAST 574 26,3245 34041 C STCALL TCECI
3372 RFF 8 LAST 502 26,3246 27135 C INTEGRV
3373 RFF 1 LAST 502 26,3247 77650 1 GOTO
3374 RFF 2 LAST 587 26,3250 03675 0 IGRFT

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R3375 THIS ROUTINE INITIALIZES THE W-MATRIX BY ZEROING ALL W THEN SETTING
 R3376 DIAGONAL ELEMENTS TO INITIAL STORED VALUES.

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3377 RFF 4 LAST 128 55,1400 EBANK= W
3378 RFF 1 LAST 582 26,3251 77776 1 WLIMIT EXIT
3379 RFF 1 LAST 582 26,3252 3 3331 C CAF WBANK
3380 RFF 14 LAST 583 26,3253 54 006 0 TS BRANK
3381 RFF 1 LAST 107 26,3254 3 3437 1 CAF WSIZE
3382 RFF 2 LAST 107 26,3255 55 256 0 TS W.IND
3383 RFF 122 LAST 586 26,3256 3 4755 1 CAF ZERO
3384 RFF 3 LAST 588 26,3257 51 256 1 INDEX W.IND
3385 RFF 5 LAST 588 26,3260 55 400 0 TS W
3386 RFF 4 LAST 588 26,3261 11 256 0 CCS W.IND
3387 RFF 1 LAST 583 26,3262 0 3255 0 TC -5
3388 RFF 2 LAST 583 26,3263 3 3332 0 CAF AICBANK RSTORCE EBANK 7
3389 RFF 15 LAST 588 26,3264 54 006 0 TS BRANK
3390 RFF 55 LAST 583 26,3265 0 6042 1 TC INTERPT
3391 RFF 1 LAST 583 26,3266 67214 1 BON SLOAD IF ON LUNAR SURFACE, INITIALIZE WITH
3392 RFF 10 LAST 583 26,3267 04307 1 SUPFLAG WSURFPOS AND WSURFVEL INSTEAD OF
3393 RFF 1 LAST 118 26,3270 55274 0 WLSRFPOS WRENDPOS AND WRENDVEL
3394 RFF 2 LAST 118 26,3271 02001 1 WRENDPOS
3395 RFF 1 LAST 118 26,3272 77650 1 GOTO
3396 RFF 1 LAST 118 26,3273 55276 1 WPOSTORE
3397 RFF 1 LAST 118 26,3274 77735 0 WLSRFPOS SLOAD
3398 RFF 1 LAST 118 26,3275 02007 1 WSURFPOS
3399 RFF 1 LAST 118 26,3276 77661 0 WPOSTORE SP SHIFT TO B-15 SCALE
3400 RFF 1 LAST 118 26,3277 02006 0 W
3401 RFF 6 LAST 588 26,3300 02411 0 STORE W
3402 RFF 7 LAST 588 26,3301 02411 1 STORE W +80
3403 RFF 8 LAST 588 26,3302 02421 1 STORE W +160
3404 RFF 1 LAST 588 26,3303 67214 1 BON SLOAD
3405 RFF 11 LAST 588 26,3304 04307 1 SUPFLAG
3406 RFF 1 LAST 588 26,3305 55274 1 WLSRFVFL
3407 RFF 1 LAST 588 26,3306 02002 1 WRENDVFL
3408 RFF 1 LAST 588 26,3307 77650 1 GOTO
3409 RFF 1 LAST 588 26,3310 55313 0 WLSRFVFL WFLSTOR
3410 RFF 1 LAST 588 26,3311 77735 0 WFLSTOR
3411 RFF 1 LAST 588 26,3312 02011 1 WSURFVFL
3412 RFF 9 LAST 588 26,3313 02511 0 WFLSTOR STORE W +720
3413 RFF 1 LAST 588 26,3314 02521 0 STORE W +800
3414 RFF 11 LAST 588 26,3315 02531 1 STORE W +880
3415 RFF 1 LAST 588 26,3316 77735 0 SLOAD
3416 RFF 1 LAST 588 26,3317 02003 0 WSURFVFL
3417 RFF 12 LAST 588 26,3320 02621 0 STORE W +1440
3418 RFF 1 LAST 588 26,3321 77735 0 SLOAD

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3419	REF	1		26,3322	02004 1		WTFUN	
3420	REF	13	LAST	588	26,3322	02631 1	STORE	W +1520
3421					26,3324	66214 0	SET	SSP
3422	REF	8	LAST	586	26,3325	02476 0		RENDWFLG
3423	REF	4	LAST	587	26,3326	03463 0		MARKCTR
3424					26,3327	00000 1		0
3425					26,3330	77616 0	RVQ	
3426	REF	14	LAST	589	25,1410		EBANK=	W
3427	REF	3	LAST	587	26,3331	54065 0	WBANK	PRCCN W-LIMIT
3428	REF	7	LAST	583	27,1457		EBANK=	AIC
3429	REF	2	LAST	508	26,3332	54067 1	AIBANK	BBCCN LSP22.3

R3430 GETULC

R3431 THIS SUBROUTINE COMPUTES THE RELATIVE POSITION VECTOR BETWEEN THE CSM
 P3432 AND THE LM, LEAVING THE UNIT VECTOR IN THE PUSHLIST AND MPAC AND THE
 R3433 MAGNITUDE IN 360.

3434				26,3343	77211 1	GETULC	SETPC	VLOAD	
3435				26,3334	11001 0			0	
3436	REF	1		26,3335	01645 1			DELTALEN	
3437				26,3336	77754 1		LXA,2		
3438	REF	3	LAST	580	26,3337	03720 1		SCALESHIFT	LCAD X2 WITH SCALE SHIFT
3439				26,3340	53257 1		VSR*	VAD	
3440				26,3341	57165 1			9D,2	SHIFT FOR EARTH/MOON SPHERE
3441	REF	2	LAST	512	26,3342	01661 1		PCVLEN	
3442				26,3343	53715 1		PCVL	VSR*	
3443	REF	1		26,3344	01573 1			DELTA CS 4	
3444				26,3345	57165 1			9D,2	SHIFT FOR EARTH/MOON SPHERE
3445				26,3346	52255 1		VAD	VSU	
3446	REF	1		26,3347	01607 1			PCVCSN	
3447				26,3350	41424 1		RTB	PUSH	USE NORMUNIT TO PRESERVE ACCURACY
3448	REF	1		26,3351	21725 1			NORMUNX1	
3449	REF	7	LAST	585	26,3352	17724 0	STCDL	ULC	
3450				26,3353	01045 0			360	
3451				26,3354	77657 0		SL*		ADJUST MAGNITUDE FROM NORMUNIT
3452				26,3355	20201 0			0,1	
3453				26,3356	24045 0		STQVL	360	ULC IN PCO AND MPAC, PLC IN 360
3454	REF	8	LAST	589	26,3357	03724 0		ULC	
3455				26,3360	77616 0		RVQ		

R3456 RADARANG

R3457 THIS SUBROUTINE COMPUTES SIN THETA = -LLC DOT MY
 R3458 PX2 = (SGRT (1-SIN THETA**2))PLC
 R3459 OUTPUT
 R3460 ULC IN ULC, PCO
 R3461 PLC IN P3360
 R3462 SIN THETA IN SIN THETA AND PDA
 R3463 PX2 NORM IN PX2 IN IN X11

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3464					26,3361	45020 1	RADARANC STG	CALL	
3465	REF	2	LAST	146	26,3362	03675 0		PDRPT	
3466	REF	3	LAST	581	26,3363	55333 1		GETULC	
3467					26,3364	50276 1		VCCMP	
3468	REF	5	LAST	585	26,3365	03705 0		MY	
3469					26,3366	41572 1		PUSH	SIN THETA TO PD6
347	REF	3	LAST	586	26,3367	03732 1		STCRF	SIN THETA
3471					26,3370	44316 0		DSQ	BDSU
3472	REF	4	LAST	591	26,3371	06514 1		DF1/4TH	1 - (SIN THETA)**2
3473					26,3372	41366 1		SOPT	DMP
3474					26,3373	00045 0			360
3475					26,3374	60252 0		SLI	NCFM
3476	REF	4	LAST	591	26,3375	00047 1			X1
3477	REF	10	LAST	586	26,3376	02722 0		STCRF	RX2
3478					26,3377	77652 1		COTC	EXIT
3479	REF	3	LAST	590	26,3400	03675 0			RCRET
3480					26,34 1	45020 1	LGCLPCTE STG	CALL	
3481	REF	4	LAST	508	26,3402	03675 0		LGRET	
3482	REF	1			26,3403	46533 0		INCCRF1	
3483					26,3404	51575 1		VLCAD	ABVAL
3484	REF	3	LAST	127	26,3405	02673 1			DELTAx +6
3485					26,3406	53754 1		LXA,2	SRR*
3486	REF	4	LAST	585	26,3407	02722 1			SCALSHFT
3487					26,3410	56174 0			2,2
3488	REF	2	LAST	315	26,3411	24317 1		STCVL	R22DISP +2
3489	REF	4	LAST	590	26,3412	02665 0			DELTAx
3490					26,3413	53646 0		ABVAL	SRR*
3491					26,3414	56174 0			2,2
3492	REF	4	LAST	590	26,3415	00315 0		STORE	P22DISP
3493					26,3416	54335 0		SLCAD	SE
3494	REF	1			26,3417	02005 0			FMAX
3495					26,3420	20613 1			IND
3496					26,3421	50025 0		DSL	BMA
3497	REF	5	LAST	590	26,3422	02315 0			R22DISP
3498	REF	1			26,3423	50566 1			R22LEM96
3499					26,3424	45335 0		SLCAD	DSL
3500	REF	1			26,3425	02006 0			VMAX
3501	REF	6	LAST	590	26,3426	00317 1			R22DISP +2
3502					26,3427	77640 0		PWN	
3503	REF	2	LAST	590	26,3430	50566 1			R22LEM96
3504					26,3431	77624 1	ASTCK	CALL	
3505	REF	1			26,3432	46745 0			INCCRF2
3506					26,3433	77650 1		CCTC	
3507	REF	5	LAST	590	26,3434	03675 0			IGRET
3508					26,3435	00103 0	INLVAR	2DFC	E-6 B12
3509					26,3436	03270 0			RAD**2
3510					26,3437	00241 0	WSIZE	DEC	161
3511					26,3440	31103 1	2PI/8	2DEC	3.141592653 B-2
3512					26,3441	36652 0			
3513	REF	20	LAST	575	27,1456			EBANK=	LCSCOUNT

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R3512 PROGRAM NAME LRS24.1 P1 SEARCH ROUTINE
 R3513 MOD AC 0 EY P VOLANTE SEC

DATE 1-15-67

R3514 FUNCTIONAL DESCRIPTION

R3515 DRIVES THE RENDEZVOUS RADAR IN A HEXAGONAL SEARCH PATTERN ABOUT THE LCS TO THE CSM (COMPUTED FROM THE CSM AND LM
 R3517 STATE VECTORS) CHECKING FOR THE DATA GOOD DISCRETE AND MONITORING THE ANGLE BETWEEN THE RADAR BERESIGHT AND THE
 R3519 LM +Z AXIS. IF THIS ANGLE EXCEEDS 30 DEGREES THE PREFERRED TRACKING ATTITUDE ROUTINE IS CALLED TO PERFORM AN
 R3521 ATTITUDE MANEUVER.

R3522 CALLING SEQUENCE - BANKCALL FOR LRS24.1

R3523 SUBROUTINES CALLED

R3524 LEMCONIC P611EM
 R3525 CSMCONIC R001SSM
 R3526 JOPPELAY FLACDOWN
 R3527 WAITLIST FLACUP
 R3528 RPNP BANKCALL

R3529 EXIT - TO END OF JCE WHEN THE SEARCH FLAG (SRCHOPT) IS NOT SET

R3530 OUTPUT

R3531 DATAGOOD (SPI)-FOR DISPLAY IN P1- 0000 INDICATES NO LOCKON
 R3532 11111 INDICATES LOCKON ACHIEVED
 R3533 DMEGAD (SPI)-FOR DISPLAY IN P2- ANGLE BETWEEN PR BERESIGHT VECTOR AND THE SPACECRAFT +Z AXIS

R3535 ERASABLE INITIALIZATION REQUIRED
 R3536 SEARCH FLAG MUST BE SET
 R3537 LM AND CSA STATE VECTORS AND REFSMMAT MATRIX
 R3538 DEBRIS

R3539 PLMSRCH LXVECT
 R3540 VXRIM HYVECT
 R3541 LOSDESRO NSRCHPNT
 R3542 DATAGOOD DMEGAD
 R3543 MPAC PLSHLIST

3544 RFF 1 COUNT# 11/LRS24
 3545 RFF I23 LAST 580 26,3442 3 4755 1 LRS24.1 CAF ZERC
 3546 RFF 2 LAST 145 26,3443 55,736 0 TS NSRCHPNT
 3547 RFF F2 LAST 553 26,3444 3 4736 1 CHKSPCH CAF BIT14
 3548 26,3445 0 0006 1 EXTEND

SET SEARCH PATTERN POINT COUNTER TO ZERO
 ISSUE AUTO TRACK ENABLE TO RADAR

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3549	REF	25	LAST	566	26,3446	05 712 1	WCR	CHAR12	
3550	REF	1			26,3447	3 4736 1	CAF	SRCHCRIT	CHECK IF SEARCH STILL REQUESTED
3551	REF	10	LAST	554	26,3450	7 0075 1	MASK	FLAGWRD2	(SPCHCPT FLAG SET)
3552					26,3451	0 0006 1	EXTEND		
3553	REF	95	LAST	554	26,3452	1 5155 1	RZF	ENDCFJCB	NO-TERMINATE JCB
3554	REF	1			26,3453	3 3713 1	CAF	6SECCNDS	SCHEDULE TASK TO DRIVE RADAR TO NEXT PT.
3555					26,3454	0 0004 0	INHINT		
3556	REF	24	LAST	565	26,3455	0 5203 0	TC	WAITLIST	IN 6 SECCNDS
3557	REF	21	LAST	590	26,3456	0 0000 0	FRANK	LCSCCUNT	
3558	REF	3	LAST	518	26,3456	0 0000 0	2CADR	CALLOGCH	
3559					26,3457	54067 1			
3560	REF	96	LAST	572	26,3460	0 0003 1	RELINT		
3561	REF	5	LAST	548	26,3461	4 0110 0	CS	RADMCDES	IS REMODE IN PROGRESS
3562					26,3462	7 4736 0	MASK	REMFCEBIT	
3563	REF	56	LAST	592	26,3463	0 0006 1	EXTEND		
3564	REF	56	LAST	588	26,3464	1 5155 1	EZF	ENDOFJOB	YES- WAIT SIX SECCNDS
3565					26,3465	0 6042 1	TC	INTERPRET	
3566	REF	12	LAST	520	26,3466	42234 0	RTB	DAD	COMPLETE LCS AT PRESENT TIME + 1.5 SEC.
3567	REF	1			26,3467	21574 1		LOADTIME	
3568	REF	19	LAST	588	26,3470	15715 0		1.5SECS	
3569	REF	4	LAST	569	26,3471	34041 0	LFS24.11	STCALL	TDFC1
3570					26,3472	27101 1		LFMCNOC	EXTRAPOLATE LM STATE VECTOR
3571	REF	7	LAST	569	26,3473	77775 1	VLCAD		
3572	REF	4	LAST	145	26,3474	00001 0		RATT	
3573	REF	3	LAST	569	26,3475	27676 1	STOVL	RLMSRCH	SAVE LEM POSITION
3574	REF	1			26,3476	00007 0		VATT	
3575	REF	6	LAST	569	26,3477	17740 1	STOCL	SAVLEMV	SAVE LEM VELOCITY
3576	REF	20	LAST	592	26,3500	10015 0		TAT	
3577	REF	2	LAST	569	26,3501	24041 0	STCALL	TDFC1	EXTRAPOLATE CSM STATE VECTOR
3578					26,3502	27067 0		CSMCNOC	EXTRAPOLATE CSM STATE VECTOR
3579	REF	8	LAST	592	26,3503	52375 1	VLCAD	VSL	LCS VECTOR = R(CSM)-R(LM)
3580	REF	5	LAST	592	26,3504	00001 0		RATT	
3581					26,3505	03676 0		RLMSRCH	
3582	REF	2	LAST	145	26,3506	77656 1	UNIT		
3583	REF	4	LAST	592	26,3507	27712 0	STOVL	LCSDESPO	STOPE DESIRED LCS
3584					26,3508	00007 0		VATT	COMPUTE UNIT(V(CM) CROSS R(CM))
3585	REF	6	LAST	592	26,3511	47256 0	UNIT	VXV	
3586					26,3512	00001 0		RATT	
3587	REF	2	LAST	145	26,3513	77656 1	UNIT		
3588					26,3514	03774 1	STORE	VXPCM	
3589	REF	5	LAST	592	26,3515	52375 1	VLCAD	VSL	
3590	REF	2	LAST	592	26,3516	00007 0		VATT	
3591					26,3517	03740 1		SAVLEMV	
3592	REF	13	LAST	584	26,3520	76521 0	MXV	VSL1	CONVERT FROM REFERENCE TO STABLE MEMBER
3593	REF	2	LAST	592	26,3521	01734 0		REFSMAT	
3594					26,3522	03740 1	STORE	SAVLEMV	VLC = V(CSM) - V(LM)
					26,3523	52125 0	SLCAD	RZE	CHECK IF N=0

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3595	REF	3	LAST	591	26,3524	03737	1		NSFCHPNT	
3596	REF	1			26,3525	55626	1		DFSGLCS	YES-DESIGNATE ALCNG LCS
3597					26,3526	53025	0	DSU	BZF	IS N=1
3598	REF	1			26,3527	15711	1		CNECCT	YES-CALCULATE X AND Y AXES OF
3599	REF	1			26,3530	55023	0		CALCXY	SEARCH PATTERN COORDINATE SYSTEM
3600					26,3531	77775	1	VLOAD		NO-ROTATE X-Y AXES TO NEXT SEARCH POINT
3601	REF	2	LAST	145	26,3532	03720	1		UXVECT	
3602	REF	1			26,3533	24015	0	STOVL	UXVECTPR	SAVE ORIGINAL X AND Y VECTORS
3603	REF	2	LAST	145	26,3534	03726	1		UYVECT	UXPRIME = ORIGINAL UX
3604	REF	1			26,3535	00023	0	STORE	UYVECTPR	UYPRIME = ORIGINAL UY
3605					26,3536	77761	1	VXSC		
3606	REF	1			26,3537	15705	1		SIN60DEG	UX =(COS 60)UXPR +(SIN 60)UYPR
3607	REF	3	LAST	593	26,3540	27720	1	STOVL	UXVECT	
3608	REF	2	LAST	593	26,3541	00015	0		UXVECTPR	
3609					26,3542	53361	0	VXSC	VAD	
3610	REF	1			26,3543	06522	1		COS60DEG	
3611	REF	4	LAST	593	26,3544	03720	1		UXVECT	
3612					26,3545	77656	1	UNIT		
3613	REF	5	LAST	593	26,3546	27720	1	STOVL	UXVECT	
3614	REF	3	LAST	593	26,3547	00015	0		UXVECTPR	UY=(-SIN60)UXPR +(COS 60)UYPR
3615					26,3550	77761	1	VXSC		
3616	REF	2	LAST	593	26,3551	15705	1		SIN60DEG	
3617	REF	3	LAST	593	26,3552	27726	1	STOVL	UYVECT	
3618	REF	2	LAST	593	26,3553	00023	0		UYVECTPR	
3619					26,3554	52361	1	VXSC	VSU	
3620	REF	2	LAST	593	26,3555	06522	1		COS60DEG	
3621	REF	4	LAST	593	26,3556	03726	1		UYVECT	
3622					26,3557	77656	1	UNIT		
3623	REF	5	LAST	593	26,3560	03726	1	STOVL	UYVECT	
3624					26,3561	53361	0	OFFCALC	VXSC	OFFSET VECTOR = K(UY)
3625	REF	1			26,3562	15707	0		VAD	LCS VECTOR + OFFSET VECTOR OFFINES
3626	REF	3	LAST	592	26,3563	03712	0		OFFSFAC	DESIRE POINT IN SEARCH PATTERN
3627					26,3564	64256	1	UNIT	LCSDESRO	
3628	REF	14	LAST	592	26,3565	01734	0		MXV	
3629					26,3566	77772	1		REFSMNAT	CONVERT TO STABLE MEMBER COORDINATES
3630	REF	13	LAST	575	26,3567	25101	0	VSIL		
3631	REF	4	LAST	592	26,357	03740	1	CONTCESC	STOVL	RTARGET
3632	REF	5	LAST	569	26,3571	01761	0		SAVLEMV	
3633					26,3572	77776	1	STORE	LCSVEL	
3634					26,3573	00004	0	EXIT		
3635	REF	7	LAST	565	26,3574	06032	0	INHINT		
3636	REF	4	LAST	565	26,3575	52613	1	TC	KILLTASK	KILL ANY PRESENTLY WAITLISTED TASK
A3637								CADR	DEFLOOP +2	WHICH WOULD DESIGNATE TC THE LAST
3638	REF	1			26,3576	44735	0			POINT IN THE PATTERN
3639	REF	27	LAST	592	26,3577	70110	0	CONTCESC2	CS	
3640	REF	2	LAST	593	26,3600	64735	1		CDSEBIT	SET BIT 15 OF RADMCDES TO INDICATE
3641	REF	58	LAST	593	26,3601	54110	0	AC	RACMCDES	A CONTINUOUS DESIGNATE WANTED.
3642	REF	57	LAST	592	26,3602	06042	1	TS	RACMCDES	
								TC	INTPRFT	
3643					26,3603	77624	1	CALL		

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3644	REF	3	LAST	512	26,3604	52404 1	RRDFSSM	DESIGNATE RADAR TC PRITARGET VECTOR
3645					26,3605	77776 1	EXIT	
3646	REF	1			26,3606	0 3675 0	TC	LCS NOT IN YCCE 2 COVERAGE (P22)
3647	REF	2	LAST	594	26,3607	0 3675 0	TC	VEHICLE MANEUVER REQUIRED (P20)

A3648

A3649

COMPUTE CMEGA, ANGLE BETWEEN RR LGS AND SPACECRAFT +Z AXIS

3650					26,3610	0 0006 1	CMEGCALC	EXTEND	
3651	REF	10	LAST	573	26,3611	3 0036 1	CCA	CDLT	
3652	REF	8	LAST	574	26,3612	53 1753 0	EXCH	TANGNB	
3653	REF	68	LAST	593	26,3613	0 6742 1	TC	INTERPT	
3654					26,3614	77624 1	CALL		
3655	REF	3	LAST	574	26,3615	46041 0		RRNB	
3656					26,3616	65545 0	ELCAL	ACES	CMEGA IS ARCCOSINE OF Z-COMPONENT OF
3657					26,3617	00046 0		360	VECTOR COMPUTED BY RRNB (LEFT AT 32F)
3658	REF	3	LAST	145	26,3620	03735 0	STORE	CMEGDISP	STORE FOR DISPLAY IN R2
3659					26,3621	77776 1	EXIT		
3660	REF	97	LAST	592	26,3622	1 5155 0	TC	ENDOFJOB	

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P3661 CALCULATE X AND Y VECTORS FOR SEARCH PATTERN COORDINATE SYSTEM

3662					26,3623	47375 0	CALCXY	VLCAD	VXV	
3663	REF	2	LAST	592	26,3624	03704 1			VXPCM	
3664	REF	4	LAST	593	26,3625	03712 0			LCSDESRO	
3665					26,3626	77556 1		UNIT		
3666	REF	6	LAST	593	26,3627	27720 1		STOVL	UXVFCT	UX = (VLM X FLN) X LCS
3667	REF	5	LAST	595	26,3631	03712 0			LCSDESRO	
3668					26,3631	53435 0		VXV	UNIT	
3669	REF	7	LAST	595	26,3632	03720 1			UXVFCT	
3670	REF	6	LAST	593	26,3633	03726 1		STORE	UYVFCT	UY = LCS X LX
3671					26,3634	77650 1		GETC		
3672	REF	1			26,3635	55561 0			OFFCALC	

3673					26,3636	64375 1	DFSGLCS	VLCAD	MXV	WHEN N = 0, DESIGNATE ALONG LOS
3674	REF	6	LAST	595	26,3637	03712 0			LCSDESRO	
3675	REF	15	LAST	593	26,3640	01734 0			REFSMAT	CONVERT LOS FROM REFERENCE TO SW COORDS
3676					26,3641	52172 1		VSL1	GETC	
3677	REF	1			26,3642	55567 0			CONTDESG	

3678	REF	22	LAST	500	26,3643	30 074 1	CALLECCF	CAF	FLAGWRD	IS RENDEFVOCUS FLAG SET
3679	REF	8	LAST	541	26,3644	7 4745 1		MASK	RADVZBIT	
3680					26,3645	0 0006 1		EXTEND		
3681	REF	25	LAST	532	26,3646	1 5261 0		BZF	TASKOVER	NC-EXIT R24
3682	REF	2	LAST	492	26,3647	2 7716 0		CAF	PRI025	YES - SCHEDULE JOB TO DRIVE RADAR TO NEXT
3683	REF	23	LAST	548	26,3650	0 5105 0		TC	5INDVAC	POINT IN SEARCH PATTERN
3684	REF	6	LAST	592	26,3651	03654 0		EBANK=	RLMSFCH	
3685	REF	1			26,3651	03654 0		2CADR	DATGDCBK	
3686	REF	1			26,3652	54067 1				
3686	REF	26	LAST	595	26,3653	0 5261 1		TC	TASKOVER	

3687	REF	27	LAST	563	26,3654	3 4750 1	DATGDCBK	CAF	BIT4	
3688					26,3655	0 0006 1		EXTEND		CHECK IF DATA GOOD DISCRETE PRESENT
3689	REF	20	LAST	573	26,3656	02 033 0		PAND	CH/N33	
3690					26,3657	0 0006 1		EXTEND		
3691	REF	1			26,3660	1 3667 1		BZF	STOREIS	YES- GO TO STORE 11111 FOR DISPLAY IN R1
3692	REF	14	LAST	435	26,3661	4 6245 0		CS	SIX	
3693	REF	4	LAST	593	26,3662	6 1736 1		AF	NSRCHENT	IS N GREATER THAN 6
3694					26,3663	0 0006 1		EXTEND		
3695	REF	2	LAST	518	26,3664	1 3442 1		BZF	LRS24.1	YES - RESET N = 0 AND START AROUND AGAIN
3696	REF	5	LAST	595	26,3665	25 1736 1		INCR	NSRCHENT	NC-SFT N = N+1 AND GO TO
3697	REF	1			26,3666	1 3444 1		TCF	CHKSCH	NEXT POINT IN PATTERN

3698	REF	1			26,3667	3 3703 0	STOREIS	CAF	ALLIS	STORE 11111 FOR DISPLAY IN R1
3699	REF	5	LAST	517	26,3670	55 1733 0		TS	DATGDCBK	

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3700				26,3671	C 7004 0	INHINT		
3701	REF	8	LAST	593	26,3672	C 6032 0	TC	KILLTASK
3702	REF	5	LAST	593	26,3673	52613 1	CADR	DESLOOP +2
3703	REF	58	LAST	594	26,3674	C 5155 0	TC	ENDCFJOB
3704	REF	26	LAST	557	26,3675	C 5567 0	LTMALARM	TC
3705					26,3676	C 0527 1	TC	ALARM
3706					26,3677	C 0014 0	TC	527
3707	REF	9	LAST	596	26,3678	C 6032 0	INHINT	
3708	REF	4	LAST	592	26,3701	55643 0	TC	KILLTASK
3709	REF	99	LAST	596	26,3702	C 5155 0	CADR	CALLEGCH
							TC	ENDCFJOB
3710					26,3713	25547 0	ALLIS	DEC
3711					26,3714	33555 1	SIN60DEC	2DEC
3711					26,3715	01106 1		
3712	REF	7	LAST	363	23,2521		COS60DEC =	DPHALF
3713					0014		UXVECTPR	EQUALS 120
3714					0122		UYVECTPR	EQUALS 180
3715					0014		RLMUNIT	EQUALS 120
3716					26,3716	01642 0	OFFSTFAC	2DEC 0.05678
3716					26,3717	11045 0		TANGENT OF 3.25 DEGREES
3717					26,3710	00001 0	CNEOCT	CCT 00001
3718					26,3711	00000 1	3SECONDS	2DEC 300
3718					26,3712	00454 1		
A3719								**** NOTE-THESE TWO CONSTANTS MUST ****
A3720								**** BE IN THIS ORDER BECAUSE ****
								**** CNEOCT NEEDS A LOWER ORDER ****
								**** WORD OF ZERGES ****
3721					26,3713	01130 1	6SECONDS	DEC 600
3722					26,3714	00000 1	1.5SECS	2DEC 150
3722					26,3715	00226 1		
3723	REF	3	LAST	485	23,2523		ZERO/SF	EQUALS F16ZEROS
3724					4616			BLOCK 02
3725	REF	3	LAST	225	6111			SETLCC FFTAG5
3726					6025			BANK
3727	REF	1						COUNT# \$\$/P20
3728					6025	00006 1	GCTCV56	EXTEND
3729	REF	1			6026	3 6031 0	DCA	VB56CADR
3730	REF	4	LAST	455	6027	1 5165 1	TCF	SLPDCHZ
3731	REF	2	LAST	488	57,1471		EBANK=	WPCARES
3732	REF	2	LAST	262	6030	00041 1	VB56CADR	2CADR TRMTRACK
3732					6031	66107 1		

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R3733 PROGRAM NAME: R29 (RENDERZVOUS RADAR DESIGNATE DURING POWERED FLIGHT)
R3734 MOD NO. 2 BY F. BLAIR-SMITH JULY 2, 1968.

R3735 FUNCTIONAL DESCRIPTION:

R3736 DESIGNATES THE RENDERZVOUS RADAR TOWARD THE COMPUTED LCS TO THE CSM, WITH THE CHIEF OBJECTIVE OF OBTAINING RANGE
R3738 AND RANGE RATE DATA AT 2-SECOND INTERVALS FOR TRANSMISSION TO THE GPCUND. WHEN THE RR IS WITHIN .5 DEGREE OF
R3740 THE COMPUTED LCS, TRACKING IS ENABLED, AND DESIGNATION CONTINUES UNTIL THE DATA-CCCD DISCRETE IS RECEIVED. AT
R3742 THAT POINT, DESIGNATION CEASES AND A RADAR-READING ROUTINE TAKES OVER, PREPARING A CONSISTENT SET OF DATA FOR
R3744 DOWN TELEMETRY. THE SET INCLUDES RANGE, RANGE RATE, MARK TIME, TWO RR CCU ANGLES, THREE IMUCCU ANGLES, AND AN
R3746 INDICATOR WHICH IS 1 WHEN THE SET IS CONSISTENT AND 0 OTHERWISE. THE INDICATOR IS IN TRKMKCNT.

R3749 CALLING SEQUENCE: BEGUN EVERY 2 SECONDS AS AN INTEGRAL PART OF SERVICER

R3750 SUBROUTINES CALLED:

R3751 RCMODE PRONLY
R3752 UNIT MPACVBUF
R3753 GLICTRIC AX*SR*
R3754 SPSIN SPCCS
R3755 SETRPECR RRQUT
R3756 RRRDEL RRRANCE

R3757 EXIT: TO NOR2SNOW, IN SERVICER.

R3758 FLTPLT: (ALL FOR DOWNLINK)

R3759 RM RDCM (RAW)
R3760 AIC AMG

R3761 AFG TRKMKCNT TRKMKCNT = 00001 IF SET IS CONSISTENT,
R3762 TANGNB TANGNB +1 OTHERWISE TRKMKCNT = 00000.
R3763 MKTIME

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P3764 ERASABLE INITIALIZATION REQUIRED:

P3765 NOR2SFLG REACKFLG (TC 1 AND 0 BY FRESH START) (RESET NOR2SFLG TC LET SERVICER FLN R29)
 P3767 PIPTIME PADMODES (BIT 1) (BIT SET TC 0 BY FRESH START)
 P3768 R(CSM) V(CSM)
 P3769 P V (PIPTIME THRU V BY AVE G IN SERVICER)

P3770 DEBRIS:

P3771 RACMODES (BIT 10)
 P3772 LOSM L7SVDI/4 (= RRTARGET & LOSVEL)
 P3773 SAVECOUT OLDOSFLG (SAVECOUT = WLOSV)
 P3774 LOSCMFLG REACKFLG

P3775 ALARMS: NONE.

P3776 COMPONENT JCPS AND TASKS:

P3777 INITIALIZING, IF ER IS FOUND TC BE IN MODE 1: JCE R29REMCJ AND TASK REMCDE; ALWAYS: TASK PREPCS29.
 P3779 DESIGNATING: TASK BEGDECS29 & JOB P29DODES.
 P3780 RADAR READING: TASK W29REAF AND JCE R29RCJDE. ALL JCBS ARE NOVAC TYPE.

3781		33,2045	BANK 33
3782	RFF 1	33,2110	SFTLCC R29/SERV
3783		33,2045	BANK

3784	RFF 1		CCLNT# 11/R29
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3785	RFF 2 LAST 389	5114	N4298REP EQUALS EBANK5
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R3786 SERVICEP COMES TO P29 FROM "P29?" IF NCR29FLG, READRFLC, RRREMODE, RRCDLZFC, RRREPCS, AND DISPLAY-INERTIAL-DATA
 R3788 ARE ALL RESET, AND THE CP IS IN LCC MODE (OFTEN CONFUSINGLY CALLED AUTO MODE).

3790	REF	99	LAST	593	33,2045	4 0110 0	R29	CS	PADMCCES	
3791	REF	5	LAST	548	33,2046	7 4742 0		MASK	DESIGBIT	
3792					33,2047	0 0006 1		EXTEND		
3793	REF	1			33,2050	1 2123 1		BZF	P29.LCS	BRANCH IF DESIGNATION IS ALREADY ON.
3794					33,2051	0 0004 0		INFINIT		
3795	REF	100	LAST	599	33,2052	26 110 0		ADS	PADMCCES	SHOW THAT DESIGNATION IS NOW ON.
3796	REF	53	LAST	591	33,2053	4 4736 0		CS	BIT14	
3797					33,2054	0 0006 1		EXTEND		
3798	REF	40	LAST	592	33,2055	03 012 1		WAND	CHAN12	REMOVE RF TRACK ENABLE DISCPETE.
3799	REF	2	LAST	554	33,2056	4 4740 1		CS	LDSCMBIT	
3800	REF	11	LAST	592	33,2057	7 0076 1		MASK	FLAGARD2	
3801	REF	12	LAST	599	33,2060	54 076 1		TS	FLAGARD2	CLEAR LDSCMFLC TO SHOW CFS. LCCP IS OFF.
3802	REF	1			33,2061	4 4753 0		CS	OLDESBIT	
3803	REF	39	LAST	593	33,2062	7 0074 0		MASK	STATE	
3804	REF	40	LAST	599	33,2063	54 074 0		TS	STATE	SHOW THAT DES. LCCP IS ACT REQUESTED.
3805	REF	154	LAST	580	33,2064	0 4615 1		TC	BANKCALL	
3806	REF	2	LAST	542	33,2065	52167 0		CADR	SETRECR	ENABLE RF ERROR COUNTERS.
3807	REF	12	LAST	546	33,2066	3 4740 0		CA	ANTENBIT	
3808	REF	101	LAST	595	33,2067	7 0110 0		MASK	PADMCCES	
3809	REF	205	LAST	575	33,2070	10 000 0		CCS	A	TEST RF MODE BIT.
3810	REF	1			33,2071	1 2104 1		TCF	SETPRPOS	MODE 2.
3811	REF	2	LAST	329	33,2072	3 5031 0		CA	PRIC21	MODE 1; MUST REMOVE.
3812	REF	11	LAST	508	33,2073	0 5072 1		TC	NOVAC	
3813	REF	22	LAST	592	37,1456			EBANK=	LESCCOUNT	
3814	REF	1			33,2074	02113 0		2CADR	R29PENCJ	NEEDS OWN JOB TO REINSTALL IN.
3814	REF	1			33,2075	66067 0				
3815	REF	6	LAST	595	33,2076	4 4742 0		CS	DESIGBIT	
3816	REF	102	LAST	599	33,2077	7 0110 0		MASK	RADMCCES	CLEAR DESIGNATE FLAG IN RADMCCES
3817	REF	103	LAST	599	33,2100	54 110 0		TS	RADMCCES	BEFORE CALLING REMODE
3818	REF	6	LAST	592	33,2101	3 4736 1		CA	REMCCEIT	
3819	REF	104	LAST	595	33,2102	26 110 0		ADS	RADMCCES	SHOW THAT REMODING IS ON.
3820	REF	1			33,2103	1 2573 0		TCF	NCR29NCW	CONTINUE SERVICEP FUNCTIONS.
3821	REF	74	LAST	565	33,2104	2 4753 1	SETPRPOS	CA	CNE	
3822	REF	25	LAST	592	33,2105	0 5203 0		TC	WAITLIST	
3823	REF	33	LAST	595	37,1456			EBANK=	LESCCOUNT	
3824	REF	1			33,2106	02564 0		2CADR	PREPCS29	TASK TO SET TRUNNICK ANGLE TO -180 DEG.
3824	REF	1			33,2107	52067 1				
3825	REF	7	LAST	555	33,2110	3 4741 1		CA	REPCSEIT	
3826	REF	105	LAST	599	33,2111	26 110 0		ADS	PADMCCES	SHOW THAT REPOSITIONING IS ON.
3827	REF	2	LAST	599	33,2112	1 2573 0		TCF	NCR29NCW	

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P3828 RECODE PENDING VOCUS RADAR INTO MODE 2.

3829	REF	75	LAST	599	33,2113	3 4753 1	R29RENCJ	CA	ONE	
3830	REF	26	LAST	599	33,2114	0 5213 0		TC	WAITLIST	
3831	REF	34	LAST	599	57,1456			FRANK=	LOSCCUNT	
3832	REF	2	LAST	548	33,2115	02202 0		2CADP	REMODE	REMODE MUST RUN AS A TASK.
3832					33,2116	52747 1				
3833	REF	155	LAST	599	33,2117	0 4616 1		TC	BANKCALL	WAIT FOR END OF REMODING.
3834	REF	12	LAST	574	33,2120	17706 0		CADR	RADSTALL	
3835	REF	100	LAST	596	33,2121	1 5155 1		TCF	ENDOFJOB	BAC EXIT CAN'T HAPPEN.
3836	REF	101	LAST	600	33,2122	1 5155 1		TCF	ENDOFJOB	

P3837 TASK TO REPOSITION THE DRIVE TRUNNION ANGLE TO -180 DEG.

3838	REF	1			25,2500			SFTLOC	R29S1	
3839					25,2564			BANK		
3841	REF	2	LAST	368	25,3564	3 4735 1	PREPCS29	CA	NEGMAX	-180 DEG.
3841	REF	5	LAST	534	25,3565	0 2252 0		TC	PRONLY	DRIVE TRUNNION CUL.
3842	REF	8	LAST	599	25,3566	4 4741 0		CS	REFCSBIT	SHOW THAT REPOSITIONING IS OFF.
3843	REF	106	LAST	599	25,3567	7 0111 0		MASK	RACMODEFS	
3844	REF	107	LAST	600	25,3570	54 111 0		TS	FACMODEFS	
3845	REF	27	LAST	595	25,3571	1 5261 0		TCF	TASKCOVER	

R3846 COMPLETE LINE-OF-SIGHT AND LOS VELOCITY, AND PASS THEM TO THE R29000ES LOOP.

3848	REF	1			33,2045			SFTLOC	R29	
3849					33,2123			BANK		
3850					33,2123	0 0006 1	R29.LCS	EXTEND		
3851	REF	4	LAST	337	33,2124	4 1234 1		DCS	PIPTIME	
3852	REF	259	LAST	577	33,2125	52 155 1		EXCH	MPAC	
3853					33,2126	0 0006 1		EXTEND		
3854	REF	16	LAST	572	33,2127	3 0025 0		PCA	TIME2	
3855	REF	260	LAST	600	33,2130	20 155 1		EAS	MEAC	(MEAC) = T-PIPTIME, SCALED 8-28.
3856	REF	4	LAST	337	33,2131	54 162 1		TS	MODE	SET MODE TO DCUELE PRECISION.
3857	REF	261	LAST	600	33,2132	3 0155 0		CA	MPAC +1	
3858					33,2133	0 0006 1		EXTEND		
3859	REF	23	LAST	552	33,2134	7 4740 1		MP	BIT12	
3860	REF	262	LAST	600	33,2135	52 155 1		EXCH	MEAC	T-PIPTIME NOW SCALED 8-17.
3861	REF	59	LAST	594	33,2136	0 6042 1		TC	INTERPRET	

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P3862 LSCSMFLG=1 MEANS THAT THE DESIGNATION IS READY FOR NEW DATA. SETTING LSCSMFLG MAKES II GO AWAY SO SETUP29C CAN
 R3864 START IT UP WHEN THE DATA IS IN PLACE.

3865				33,2137	52315 1	PDVL	VSL	PUSH DOWN T-PIPTIME.
3866	REF	1		33,2140	01726 0		V(CSM)	
3867	REF	2	LAST	148	33,2141	02527 1	V	LCSVEL = V(CSM) - V.
3868					33,2142	74325 0	PDCL	SWAP LCSVEL FOR T-PIPTIME, MULTIPLY THEM
3869					33,2143	52255 1	VAD	AND ADD THE RESULT TO R(CSM) - R TO GET
3870	REF	1			33,2144	01720 0		AN UP-TO-DATE LCS VECTOR IN SM AXES.
3871	REF	4	LAST	234	33,2145	03521 1	R	
3872					33,2146	77414 0	BOFSET	EXIT (BOFSET DOES ITS THING INFINITELY.)
3873	REF	9	LAST	569	33,2147	01043 1	LSCSMFLG	IF DESIGNATE LCCP IS OFF, CHANGE LSCSM-
3874	REF	1			33,2150	66152 1	SETUP29C	FLG TO ON AND GO TO SET UP NEW DATA.
3875	REF	3	LAST	599	33,2151	1 2573 0	TCF	IF DES. LCCP IS ON, LET IT USE OLD DATA.
3876	REF	1			33,2152	25101 0	SETUP29C	LINE-OF-SIGHT VECTOR, STABLE MEMBER AXES
3877					33,2153	00001 0	STCVL	
3878					33,2154	77761 1	VXSC	
3879	REF	1			33,2155	26177 1	.5SECP17	
3880	REF	1			33,2156	01761 0	STCRE	LCSVEL/4
3881					33,2157	77414 0	CLEAR	1/2 SECOND'S WORTH OF LCS VELOCITY.
3882	REF	1	LAST	601	33,2160	01263 1	EXTT	LCSMFLG
								LET R29DLOOP USE NEW DATA.
3883	REF	41	LAST	599	33,2161	4 0074 0	CS	STATE
3884	REF	2	LAST	599	33,2162	7 4753 0	MASK	OLDRESIT
3885					33,2163	0 0006 1	EXTEND	
3886	REF	4	LAST	601	33,2164	1 2573 0	BZF	NCR29NOW
3887					33,2165	0 0014 0	INFINIT	
3888	REF	42	LAST	601	33,2166	26 074 0	ADS	STATE
								OTHERWISE REQUEST IT NOW.
3889	REF	1			33,2167	11 055 1	CCS	PIPCTR
3890	REF	1			33,2170	4 4776 1	CS	SUPER110
3891	REF	4	LAST	382	33,2171	6 4777 1	AD	ISFC
3892	REF	27	LAST	600	33,2172	0 5213 0	TC	WAITLIST
3893	REF	35	LAST	600	57,1456		FRANK=	LCSFCUNT
3894	REF	1			33,2173	03356 1	2CADR	BEGDES29
3894	REF	1			33,2174	50067 0		
3895	REF	5	LAST	601	33,2175	1 2573 0	TCF	NCR29NOW
								RELINT AND CONTINUE SERVICER FUNCTIONS.
3896					33,2176	00006 1	.5SECP17	2DEC
3896					33,2177	10000 0		50 B-17

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P2507 R25 DESIGNATE JOB AND TASK MACHINERY. TASK RECUPS EVERY .5 SEC UNTIL DESIGNATE IS CALLED OFF; IT MAY WAIT FOR A
 R3829 CENTISECOND OR TWO IF IT COMES UP WHILE SETUP29D IS SUPPLYING NEW DATA.

3900 24,3356 BANK 24
 3901 REF 6 LAST 576 24,2007 SETLCC P205
 3902 24,3356 BANK

3903 REF 1 COUNT* 11/R29

3904 REF 2 LAST 599 24,3356 3 5021 0 BEGDES29 CAF PRIC21
 3905 REF 12 LAST 599 24,3357 0 5072 1 TC NCVAC
 3906 REF 2 LAST 601 F3,1760 FBANK= LCSVET/4
 3907 REF 1 24,3360 02550 0 ZCADP R29DCFS
 3907 REF 1 24,3361 64063 0

START R29DCFS JOB TWICE A SECOND.

3908 REF 2 LAST 518 24,3362 3 4774 1 R29DLCCP CAF .5SEC
 3909 REF 4 LAST 566 24,3363 0 5224 0 TC VARDELAY

3910 REF 108 LAST 600 24,3364 4 0110 0 CS RADMCDIS
 3911 REF 7 LAST 599 24,3365 7 4742 0 MASK DESIGBIT
 3912 REF 2 6 LAST 599 24,3366 10 0000 0 CCS A
 3913 REF 28 LAST 600 24,3367 1 5261 0 TCF TASKOVER

QUIT IF DESIGNATION IS CALLED OFF.

3914 REF 13 LAST 599 24,3370 4 0076 1 CS FLAGWRD2
 3915 REF 3 LAST 599 24,3371 7 4740 1 MASK LDCMPBIT
 3916 24,3372 0 0006 1 EXTEND
 3917 24,3373 1 3376 1 BZF +3
 3918 REF 14 LAST 602 24,3374 26 076 1 ACS FLAGWRD2
 3919 REF 2 LAST 601 24,3375 1 3356 0 TCF REGDES29

BRANCH IF SETUP29D'S SUPPLYING NEW DATA.
 SET LDCMPFLG: SHOW THAT DES. LCCP IS ON.

3920 REF 76 LAST 601 24,3376 3 4754 1 CA ONE
 3921 REF 1 24,3377 1 3363 0 TCF R29DLCCP +1

WAIT A CENTISECOND FOR NEW DATA.

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P3922 R29DCCFS: RR DESIGNATION LOOP FOR R29

R3923 THIS ROUTINE DOES MUCH THE SAME THING AS R29DCCFS, BUT A GREAT DEAL FASTER. IT TAKES THE NON-UNITIZED LOS VECTOR
 P3925 IN STABLE MEMBER COORDINATES (LOSSM) AND A DELTA-LOS IN SM AXES (LCSVDI/4) WHICH IS 1/2 SEC TIMES LOS VELOCITY,
 R3927 AND DEVELOPS THE SHIFT AND TRANSLATION COMMANDS USING SINGLE PRECISION AS MUCH AS POSSIBLE, AND INTERPRETIVE ACT A1
 P3929 ALL. THE UNIT(LOSSM + LCSVEL * 1 SEC) IS COMPUTED IN CP AND TRANSFORMED TO NAV BASE COORDINATES IN COUPEL PRE-
 R3931CISION (USING SP SINES AND COSINES OF COU ANGLES), AND THE REST IS DONE IN SP.

R3932 THE FUNCTIONAL DIFFERENCE IS THAT R29DCCFS ALWAYS CLEARS LOSCMFLG WHEN IT ENDS, AND IT STARTS UP THE R29PEAC
 P3935 TASK WHEN LOCK-ON IS ACTIVATED.

3936				32,2550		BANK	32	
3937	REF	2	LAST	40	32,2550	SFTLCC	F2DPS*32	
3938				32,2550		BANK		
3939	REF	1				COUNT*	11/P29	
3940	REF	3	LAST	602	E3,176	EBANK=	LCSVDI/4	
3941	REF	77	LAST	602	32,2550	3 4753 1	R29DCCFS	ONE
3942	REF	21	LAST	574	32,2551	55'106 0	TS	TANG
3943	REF	12	LAST	555	32,2552	3 4756 1	CA	FIVE
3944	REF	207	LAST	602	32,2553	10 000 0	R29DVEEC	CCS
3945	REF	174	LAST	564	32,2554	54 002 1	TS	Q
3946	REF	22	LAST	603	32,2555	11'106 0	CCS	TANG
3947	REF	1			32,2556	1 2564 0	TCF	R29DPAS1
3948					32,2557	0 0006 1	EXTEND	
3949	REF	175	LAST	603	32,2560	5 0002 0	INDEX	Q
3950	REF	4	LAST	603	32,2561	3 1761 0	CCA	LCSVDI/4
3951	REF	176	LAST	603	32,2562	50 002 0	INDEX	Q
3952	REF	2	LAST	601	32,2563	21'101 1	CAS	LOSSM
3953					32,2564	0 0006 1	R29DPAS1	EXTEND
3954	REF	177	LAST	603	32,2565	5 0002 1	INDEX	Q
3955	REF	3	LAST	603	32,2566	3 11 1 0	CCA	LOSSM
3956	REF	178	LAST	603	32,2567	50 002 0	INDEX	Q
3957	REF	263	LAST	600	32,2570	52 155 1	CXCF	MPAC +1
3958	REF	23	LAST	603	32,2571	11'106 0	CCS	TANG
3959	REF	1			32,2572	1 2600 1	TCF	R29DVEND
3960					32,2573	0 0006 1	EXTEND	
3961	REF	179	LAST	602	32,2574	5 0002 0	INDEX	Q
3962	REF	5	LAST	603	32,2575	3 1761 0	CCA	LCSVDI/4
3963	REF	180	LAST	603	32,2576	50 002 0	INDEX	Q
3964	REF	264	LAST	603	32,2577	20 156 1	DAS	MPAC +1
3965	REF	181	LAST	603	32,2578	10 002 1	R29DVEND	CCS
3966	REF	1			32,2579	1 2553 1	TCF	R29DVEEC

INDICATE 1ST PASS THRU VECTOR LOOP.

COUNT DOWN BY TWOS IN VECTOR LOOP.

DO THIS ON 1ST PASS THRU LOOP.

(A "PASS" HERE MEANS 3 TIMES AROUND).

ADVANCE LOS VECTOR 1/2 SECOND.

MOVE CURRENT LOS (1ST PASS) OR LOS PRO-
 JECTED 1/2 SEC AHEAD (2ND PASS).

ELC CLT HERE IN 1ST PASS.

PROJECT LOS 1 SECOND AHEAD (2ND PASS).

BRANCH TO CONTINUE VECTOR LOOP.

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P3967 UNITIZE AND TRANSFORM TO NAV PASS AXES THE PRESENT LCS (1ST PASS) OR THE 1-SEC PROJECTED LCS (2ND PASS).

3969	REF	265	LAST	603	32,262	52 156 1	DXCH	MFAC +1	
3970	REF	266	LAST	604	32,2613	52 155 1	DXCH	MPAC	
3971	REF	1			32,2614	3 2775 0	CA	P29FXLCC	= ACRES INTE15+ -34D
3972	REF	18	LAST	357	32,2615	54 123 0	TS	FIXLCC	
3973	REF	1			32,2616	0 4713 0	TC	USPRCADR	WITH FIXLCC ARMED FOR LENGTH AND LENGTH SQUARED, BCRPCW UNITIZING ROUTINE.
3974	REF	1			32,2617	0 1123 1	CADR	UNIT	
3975	REF	1			32,2610	0 7535 0	TC	MPACV8UF	MOVE UNIT(LCS) TO AX*SR*T ARG AREA.
3976	REF	24	LAST	603	32,2611	11'106 0	CCS	TANG	
3977					32,2612	1 2614 1	TCF	+2	
3978	REF	1			32,2613	1 2630 1	TCF	GCTANGLS	GET CDU ANGLES ONLY AFTER 1ST PASS.
3979					32,2614	0 2004 0	INHINT		ENSURE CONSISTENT CDU READINGS.
3980					32,2615	0 0006 1	EXTEND		
3981	REF	11	LAST	594	32,2616	3 1736 1	ECA	CDUT	
3982	REF	1			32,2617	53'767 1	DXCH	SAVECDUT	TRUNNICK AND SHAFT ANGLES.
3983	REF	3	LAST	573	32,2620	3 0133 1	CA	CDLY	
3984	REF	16	LAST	583	32,2621	54 765 1	TS	CDUSPCT	
3985	REF	6	LAST	358	32,2622	2 0024 0	CA	CDLZ	
3986	REF	17	LAST	604	32,2623	54 767 0	TS	CDUSPCT +2	
3987	REF	11	LAST	573	32,2624	3 0032 0	CA	CDUX	
3988	REF	18	LAST	604	32,2625	54 771 1	TS	CDUSPCT +4	CDU ANGLES IN FUNNY ORDER FOR AX*SR*T.
3989	REF	156	LAST	600	32,2626	0 4616 1	TC	BANKCALL	
3990	REF	1			32,2627	47617 1	CADR	CLICTRIG	GET SINES AND COSINES OF CDU ANGLES.
3991	REF	19	LAST	567	32,2630	4 6250 1	GCTANGLS CS	TREF	
3992	REF	157	LAST	604	32,2631	0 4616 1	TC	BANKCALL	
3993	REF	1			32,2632	47677 1	CADR	AX*SR*T	TRANSFORM UNIT LCS TO NE AXES (ULCSNB).
3994	REF	25	LAST	604	32,2633	11'106 0	CCS	TANG	
3995					32,2634	1 2636 1	TCF	+2	
3996	REF	1			32,2635	1 2703 0	TCF	R29DPAS2	GO TO PR CCMANCC COMP. AFTER 2ND PASS.

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P3997 COMPUTE CCSINE OF THE ANGLE BETWEEN THE PRESENT LCS AND THE RP BORESIGHT VECTOR, AND SET THE SELFTRACK ENABLE IF
 R3999 THE CCSINE IS APPROXIMATELY CCS(.5 DEG) OR GREATER (I.E. SMALLER ANGLE).

4000					32,2636	0 0004 0	INHINT		
4001	REF	26	LAST	604	32,2637	55 116 0	TS	TANG	INDICATE 2ND PASS THRU VECTOR LCCF.
4002	REF	2	LAST	604	32,2640	3 1766 1	CA	SAVECCUT	
4003	REF	3	LAST	190	32,2641	0 5032 0	TC	SPCOS	
4004	REF	2	LAST	252	32,2642	54 166 1	TS	PUSHLCC	PUSHLCC = CCS T.
4005	REF	3	LAST	605	32,2642	4 1766 0	CS	SAVECCUT	
4006	REF	3	LAST	189	32,2644	0 5033 1	TC	SPSIN	
4007	REF	5	LAST	600	32,2645	54 163 1	TS	MODE	MODE = -SIN T.
4008					32,2646	0 0006 1	EXTEND		
4009	REF	26	LAST	336	32,2647	7 0124 1	MP	VBUF +2	FORM - SIN T LCCSNBY.
4010	REF	267	LAST	604	32,2650	52 155 1	CXCF	MPAC	
4011	REF	4	LAST	605	32,2651	3 1767 0	CA	SAVECCUT +1	
4012	REF	4	LAST	605	32,2652	0 5033 1	TC	SPSIN	
4013	REF	5	LAST	605	32,2653	55 1766 0	TS	SAVECCUT	SAVECCUT NOW = SIN S.
4014					32,2654	0 0006 1	EXTEND		
4015	REF	3	LAST	605	32,2655	7 0165 1	MP	PUSHLCC	
4016					32,2656	0 0006 1	EXTEND		
4017	REF	27	LAST	605	32,2657	7 0122 1	MP	VBUF	FORM SIN S CCS T LCCSNEX.
4018	REF	268	LAST	605	32,2660	20 155 1	EAS	MPAC	
4019	REF	6	LAST	605	32,2661	3 1767 0	CA	SAVECCUT +1	
4020	REF	4	LAST	605	32,2662	0 5032 0	TC	SPCOS	
4021	REF	7	LAST	605	32,2663	55 1767 1	TS	SAVECCUT +1	SAVECCUT +1 NOW = COS S.
4022					32,2664	0 0006 1	EXTEND		
4023	REF	4	LAST	605	32,2665	7 0166 1	MP	PUSHLCC	
4024					32,2666	0 0006 1	EXTEND		
4025	REF	28	LAST	605	32,2667	7 0126 0	MP	VBUF +4	FORM CCS S CCS T LCCSNEX.
4026	REF	269	LAST	605	32,2670	20 155 1	EAS	MPAC	CCS(FPROP) = LCCSNR * (SIN S CCS T,
4027					32,2671	0 0006 1	EXTEND		- SIN T, CCS S CCS T).
4028	REF	270	LAST	605	32,2672	3 0155 0	ECA	MPAC	
4029	REF	271	LAST	605	32,2673	20 155 1	EAS	MPAC	(LCCSNR IN VBUF WAS A HALF-UNIT VECTOR).
4030	REF	208	LAST	603	32,2674	17 000 0	CCS	A	TEST FOR + OVERFLOW, NONE, OR MINUS.
4031	REF	54	LAST	595	32,2675	3 4736 1	CA	BIT14	
4032					32,2676	12 677 1	NCCP		
4033					32,2677	0 0006 1	EXTEND		
4034	REF	41	LAST	595	32,2700	05 112 1	ACP	CHAN12	IF PLUS OVERFLOW, SET SELFTRACK ENABLE.
4035					32,2701	0 0003 1	REFLINT		
4036	REF	2	LAST	603	32,2702	1 2552 0	TCF	R29DVBEQ -1	MAKE 2ND PASS THRU VECTOR LCCF.

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P437 COMPUTE SHAFT AND TRUNNION COMMANDS TO NULL HALF THE ERROR IN HALF A SECOND.

4039	REF	8	LAST	605	32,2703	3 1767 0	R29CPAS2	CA	SAVECDUT +1	
4040					32,2704	0 0006 1		EXTEND		
4041	REF	29	LAST	605	32,2705	7 0122 1		MP	VBUE	FORM CCS S ULCSNB'X.
4042	REF	27	LAST	605	32,2706	53 0117 1		EXCH	TANG	
4043	REF	9	LAST	606	32,2707	4 1766 0		CS	SAVECDUT	
4044					32,2710	0 0006 1		EXTEND		
4045	REF	30	LAST	606	32,2711	7 0126 0		MP	VBUE +4	FORM - SIN S ULCSNB'Z.
4046	REF	28	LAST	606	32,2712	21 0117 1		DAS	TANG	RAW SHAFT CMD = ULCSNB' . (COS S, 0,
4047	REF	6	LAST	605	32,2713	4 0163 1		CS	MODE	- SIN S)
4048					32,2714	0 0006 1		EXTEND		
4049	REF	10	LAST	606	32,2715	7 1766 0		MP	SAVECDUT	
4050					32,2716	0 0006 1		EXTEND		
4051	REF	31	LAST	606	32,2717	7 0122 1		MP	VBUE	FORM SIN T SIN S ULCSNB'X.
4052	REF	272	LAST	605	32,2720	52 155 1		EXCH	MPAC	
4053	REF	5	LAST	605	32,2721	3 0166 0		CA	FLSHLCC	
4054					32,2722	0 0006 1		EXTEND		
4055	REF	32	LAST	606	32,2723	7 0124 1		MP	VBUE +2	FORM COS T ULCSNB'Y.
4056	REF	273	LAST	606	32,2724	20 155 1		DAS	MPAC	
4057	REF	7	LAST	606	32,2725	4 0163 1		CS	MODE	
4058					32,2726	0 0006 1		EXTEND		
4059	REF	11	LAST	606	32,2727	7 1767 1		MP	SAVECDUT +1	
4060					32,2730	0 0006 1		EXTEND		
4061	REF	23	LAST	606	32,2731	7 0126 0		MP	VBUE +4	FORM SIN T COS S ULCSNB'Z.
4062	REF	274	LAST	606	32,2732	20 155 1		DAS	MPAC	RAW TRUNNION CMD = ULCSNB' .
4063	REF	275	LAST	606	32,2733	3 0154 1		CA	MPAC	(SIN S SIN T, CCS T, SIN S CCS T).
4064					32,2734	0 0006 1		EXTEND		
4065	REF	1			32,2735	7 2776 1		MP	RR2SGAIN	
4066	REF	4	LAST	552	32,2736	57 354 1		EXCH	TRUNKCMD	STORE REFINED T CMD, GET RAW S CMD.
4067					32,2737	0 0006 1		EXTEND		
4068	REF	2	LAST	606	32,2740	7 2776 1		MP	RR2SGAIN	
4069	REF	2	LAST	552	32,2741	55 355 1		TS	SHAFTCMD	STORE REFINED SHAFT COMMAND FOR RROLL

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P4072 WHETHER OR NOT TRACKING WAS ENABLED THIS TIME, CHECK ON RR DATA-GOOD. IF PRESENT, STOP DESIGNATING AND START
 R4072 READING DATA FROM THE WIND-ZVCLUS RADAR.

4073	REF	28	LAST	595	32,2742	3 4750 1	GOOD?	CAF	BIT4	
4074					32,2743	0 0006 1		EXTEND		
4075	REF	21	LAST	595	32,2744	02 023 0		RAND	CHAN33	GFT RR DATA-GOOD BIT.
4076					32,2745	0 0704 0		INFIN		(MAINLY FOR PRCLT).
4077					32,2746	0 0006 1		EXTEND		
4078	REF	1			32,2747	1 2753 0		RZF	R29LCKCA	BRANCH IF DATA-GOOD IS PRESENT.
4079	REF	158	LAST	604	32,2750	0 4616 1		TC	BANKCALL	
4080	REF	3	LAST	554	32,2751	52717 0		CADR	PRCLT	DATA-GOOD IS ABSENT, SO SEND COMMANDS.
4081	REF	1			32,2752	1 2771 0		TCF	END2900D	
4082	REF	8	LAST	602	32,2753	4 4742 0	R29LCKCA	CS	DESIGNIT	
4083	REF	179	LAST	602	32,2754	7 0110 0		MASK	RADMCDES	
4084	REF	110	LAST	607	32,2755	54 110 0		TS	RADMCDES	SHOW THAT DESIGNATION IS OVER.
4085	REF	34	LAST	575	32,2756	4 4752 1		CS	RIT2	
4086					32,2757	0 0006 1		EXTEND		
4087	REF	42	LAST	605	32,2760	03 012 1		RAND	CHAN12	DISABLE RR ERROR COUNTERS.
4088	REF	2	LAST	220	32,2761	3 4743 0		CA	READRBIT	
4089	REF	11	LAST	557	32,2762	26 077 0		ADS	FLAGWRD3	SHOW THAT READING HAS BEEN REQUESTED.
4090	REF	2	LAST	601	32,2763	11 055 1		CCS	PIPCTR	SEE IF TASK SHOULD BE OFFSET 1 SEC.
4091	REF	2	LAST	601	32,2764	4 4776 1		CS	SUPER110	- 960 + 1000 = 4.
4092	REF	5	LAST	601	32,2765	6 4777 1		AC	ISEC	0 + 1000 = 1000.
4093	REF	28	LAST	601	32,2766	0 5203 0		TC	WAITLIST	
4094	REF	36	LAST	601	32,2767	03400 0		CBANK=	LCSCOUNT	
4095	REF	1			32,2770	50067 0		2CADP	R29READ	START READING TASK AND JOP.
4096	REF	4	LAST	602	32,2771	4 4740 1	END2900D	CS	LCSCMPIT	
4097	REF	15	LAST	602	32,2772	7 0076 1		MASK	FLAGWRD2	
4098	REF	16	LAST	607	32,2773	54 076 1		TS	FLAGWRD2	ALWAYS CLEAR LCSCMFLG.
4099	REF	102	LAST	600	32,2774	1 5155 1		TCF	RADCFJOP	

4100	REF	4	LAST	96	32,2775	00052 0	R29FXLOC	ADRES	INTR15+ -340
4101					32,2776	56655 1	RP29GAIN	CEC	- .53624
4102	REF	6	LAST	593	32,2760		LCVCT/4	EQUALS	LCVEL
4103	REF	14	LAST	593	32,2760		LOSSM	EQUALS	PRTARGET
4104	REF	6	LAST	570	32,2760		SAVECUT	EQUALS	MLCSV

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P4105 RR READING IS SET UP BY R29CODES WHEN IT DETECTS RR LOCK-ON.

4106					24,3400			BANK 24		
4107	REF	7	LAST	602	24,2000			SETICC P20S		
4108					24,3400			BANK		
4109	REF	2	LAST	602 TO	603:	18	18*	CCOUNT* 14/P29		
4110	REF	37	LAST	607	E7,1456			FBANK= LOSCOUNT		
4111	REF	10	LAST	548	24,3400	3 7717 1	R29READ	CAF	PRIC26	CALLED BY WAITLIST.
4112	REF	13	LAST	602	24,3401	1 5072 1		TC	NOVAC	
4113	REF	38	LAST	608	E7,1456			SBANK= LOSCOUNT		
4114	REF	1			24,3402	03413 1		20ADR	R29PCJOB	START JOB TO READ AND DOWNLINK FOR R29.
4114	REF	1			24,3403	50067 0				
4115	REF	2	LAST	566	24,3404	3 5000 1		CA	2SECS	
4116	REF	5	LAST	602	24,3405	0 5224 0		TC	VARDELAY	
4117	REF	12	LAST	607	24,3406	3 0077 1		CA	FLAGWRD3	2 SECONDS LATER, SEE IF READING IS STILL
4118	REF	3	LAST	607	24,3407	7 4743 1		MASK	READREIT	ALLOWED (NO TRACKER FAIL ETC.)
4119	REF	219	LAST	605	24,3410	10 000 0		CCS	A	
4120	REF	2	LAST	607	24,3411	1 3400 1		TCF	R29READ	IT'S OK; CALL IT AGAIN.
4121	REF	29	LAST	602	24,3412	1 5261 0		TCF	TASKOVER	IT AIN'T; WAIT FOR REDESIGNATE.
4122	REF	13	LAST	608	24,3413	3 0077 1	R29PCJOB	CA	FLAGWRD3	CALLEC VIA NOVAC.
4123	REF	3	LAST	281	24,3414	7 4741 0		MASK	NR29FBIT	
4124	REF	210	LAST	608	24,3415	10 000 0		CCS	A	TEST "MCR29FLC".
4125	REF	1			24,3416	1 3500 0		TCF	ENDP2SRD	R29 OVER, EXIT WITH RR STILL LOCKED ON
4126	REF	111	LAST	607	24,3417	3 0111 1		CA	PACMODES	
4127	REF	6	LAST	535	24,3420	7 4752 1		MASK	ALTCMBIT	
4128	REF	211	LAST	608	24,3421	10 000 0		CCS	A	TEST RR-NOT-IN-ALTC-MODE BIT.
4129	REF	1			24,3422	1 3475 0		TCF	ENCRD29	ASTPC TCKK RR OUT OF ALTC MODE.
4130	REF	159	LAST	607	24,3423	0 4616 1		TC	BANKCALL	
4131	REF	5	LAST	573	24,3424	53112 0		CAER	RRRDOT	INITIATE READING OF RANGE RATE.
4132	REF	160	LAST	608	24,3425	0 4616 1		TC	BANKCALL	
4133	REF	13	LAST	600	24,3426	17706 0		CAER	RADSTALL	GO TO SLEEP UNTIL IT'S READY.
4134	REF	2	LAST	608	24,3427	1 3475 0		TCF	ENCRD29	BAD REAC; REDESIGNATE.

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R4135 529 RARAF READING CONTINUED.

4136	REF	7	LAST	572	24,3430	53'105 0	EXCH	TIMFFCLE	
4137	REF	276	LAST	606	24,3431	52 155 1	EXCH	MPAC	TIME OF RR READING, FOR DOWNLINK.
4138					24,3432	0 0004 0	INFINT		BE SURE OF 5 CONSISTENT CCL ANGLES.
4139					24,3433	0 0006 1	EXTEND		
4140	REF	12	LAST	604	24,3434	3 0036 1	CCA	CDLT	
4141	REF	277	LAST	605	24,3435	52 157 0	EXCH	MPAC +2	PROCU ANGLES AT RR PEAC, FOR DOWNLINK.
4142					24,3436	0 0006 1	EXTEND		
4143	REF	4	LAST	604	24,3437	3 0034 0	CCA	CDLY	
4144	REF	278	LAST	605	24,3440	52 161 0	EXCH	MPAC +4	MPAC'S 7 WORDS ARE BUFFER FOR COPYCYCLE.
4145	REF	12	LAST	604	24,3441	3 0032 0	CA	CDLX	
4146	REF	275	LAST	609	24,3442	54 162 0	TS	MPAC +6	IMLCCL ANGLES AT RR PEAC, FOR DOWNLINK.
4147	REF	161	LAST	608	24,3443	0 4616 1	R29RANGE	TC	BANKCALL
4148	REF	4	LAST	574	24,3444	53114 0	CADR	RPRANGE	INITIATE READING OF RR RANGE.
4149	REF	162	LAST	605	24,3445	0 4516 1	TC	BANKCALL	
4150	REF	14	LAST	609	24,3446	1 7706 0	CADR	RAESTALL	GO TO SLEEP UNTIL IT'S READY.
4151	REF	1			24,3447	1 3466 1	TCF	R29RRR?	BAD READ CK SCALE CHANGE ... WHICH?
4152					24,3450	0 0004 0	INFINT		
4153	REF	7	LAST	574	24,3451	53'031 0	EXCH	RPRANGE	COPYCYCLE TO LAY OUT NEW R29 DOWNLINK.
4154	REF	6	LAST	581	24,3452	53'075 1	EXCH	FM	
4155	REF	280	LAST	605	24,3453	52 155 1	EXCH	MPAC	
4156	REF	7	LAST	587	24,3454	53'075 0	EXCH	MRTIME	
4157	REF	281	LAST	605	24,3455	52 157 0	EXCH	MPAC +2	
4158	REF	5	LAST	594	24,3456	53'075 0	EXCH	TANGNE	
4159	REF	282	LAST	609	24,3457	52 161 0	EXCH	MPAC +4	
4160	REF	8	LAST	585	24,3460	53'060 0	EXCH	ALG	
4161	REF	283	LAST	609	24,3461	3 0162 1	CA	MPAC +6	
4162	REF	6	LAST	583	24,3462	55'061 1	TS	ALG	
4163	REF	78	LAST	602	24,3463	3 4753 1	CA	CNE	
4164	REF	4	LAST	315	24,3464	55'062 1	TS	TRKMKCNT	SHOW THAT DOWNLINK DATA IS CONSISTENT.
4165	REF	103	LAST	607	24,3465	1 5155 1	TCF	ENDCFJCE	
4166	REF	18	LAST	575	24,3466	4 0161 0	R29RRR?	CS	FLAGWDS
4167	REF	29	LAST	553	24,3467	7 4742 0		MASK	RITLC
4168	REF	212	LAST	608	24,3470	10 0000 0	CCS	A	WAS IT A SCALE CHANGE (PEAL OR PHONY)?
4169	REF	3	LAST	608	24,3471	1 3475 0	TCF	ENDPRD29	NO, A BAD READ; REDESIGNATE.
4170	REF	61	LAST	573	24,3472	0 5516 0	TC	DOWNFLAG	
4171	REF	2	LAST	573	24,3473	00120 1	ADRES	PNGSCFLG	
4172	REF	1			24,3474	1 3443 0	TCF	R29RANGE	YES; CLEAR FLAG AND READ AGAIN.
4173	REF	55	LAST	605	24,3475	4 4735 0	ENDRRC25	CS	PIT14
4174					24,3476	0 0006 1	EXTEND		TRCLBLF MADE LS COME HERE TO LEAVE THE
4175	REF	43	LAST	607	24,3477	03 012 1	WANC	CFAN12	RR-READING MODE. DISCRECIT COUNTEL
4176	REF	124	LAST	551	24,3500	3 4755 1	ENDR25PC	CA	ZFPC
4177	REF	5	LAST	609	24,3501	55'062 1	TS	TRKMKCNT	
4178	REF	62	LAST	609	24,3502	1 5516 0	TC	DOWNFLAG	

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4179	REF	1	24,2512	0.763	1	ADRES	READRFLG
4180	REF	104	LAST	609	24,3574	1 5155	1 TCF ENDDFJOB

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P4181 A-MATRIX MONITOR

4182 31,2007 BANK 31
 4183 REF 1 31,2009 SETLOC VR67
 4184 31,2017 BANK
 4185 REF 1 COUNT* \$1/EXTVE

4186 REF 3 LAST 318 34,1600 EBANK= WWPCS

4187 REF 60 LAST 600 31,2017 0 6042 1 V67CALL TC INTPRET
 4188 31,2010 77624 1 CALL

4189 REF 1 31,2011 62120 1 V67WW

4190 31,2012 77776 1 EXIT

4191 31,2013 0 0006 1 EXTEND

4192 REF 4 LAST 611 31,2014 3 1601 1 DCA WWPCS

4193 REF 2 LAST 318 31,2015 531607 0 DXCH WWBIAS +2

4194 31,2016 0 0006 1 EXTEND

4195 REF 2 LAST 318 31,2017 3 1603 0 DCA WWVEL

4196 REF 3 LAST 611 31,2020 531611 1 DXCH WWBIAS +4

4197 31,2021 0 0006 1 EXTEND

4198 REF 4 LAST 611 31,2022 3 1605 0 DCA WWBIAS

4199 REF 5 LAST 611 31,2023 531613 0 DXCH WWBIAS +6

4200 REF 1 31,2024 3 2143 0 V6N99S CAF V06N99

4201 REF 163 LAST 609 31,2025 0 4616 1 TC BANKCALL

4202 REF 7 LAST 291 31,2026 2 0334 1 TADR CFXDSPF

4203 REF 33 LAST 490 31,2027 1 5472 1 TCF ENDFXT

4204 REF 1 31,2030 1 2032 0 TCF V6N99SPRC

4205 REF 1 31,2031 1 2024 1 TCF V06N99PCS

4206 31,2032 22 0007 0 V6N99SPRO ZI

4207 REF 13 LAST 603 31,2033 3 4756 1 CA FIVE

4208 REF 182 LAST 610 31,2034 54 0002 1 NS9LCCP TS Q

4209 REF 183 LAST 611 31,2035 50 0002 0 INDEX Q

4210 REF 5 LAST 611 31,2036 4 1600 1 CS WWPCS

4211 REF 184 LAST 611 31,2037 50 0002 0 INDEX Q

4212 REF 6 LAST 611 31,2040 6 1606 0 AC WWPOS +6

4213 REF 52 LAST 572 31,2041 26 0001 1 ACS L

4214 REF 185 LAST 611 31,2042 10 0002 1 CCS Q

4215 REF 1 31,2043 1 2034 0 TCF NS9LCCP

4216 REF 213 LAST 609 31,2044 22 0000 1 LXCH A

4217 31,2045 0 0006 1 EXTEND

4218 REF 1 31,2046 1 2051 0 B7F V06N9933

4219 REF 35 LAST 560 31,2047 0 5504 0 TC LFFLAG

4220 REF 1 31,2050 00160 0 ACRES V67FLAG

4221 REF 61 LAST 611 31,2051 0 6042 1 V6N9933 TC INTPRET

4222 31,2052 77414 0 ROM EXIT

4223 REF 2 LAST 611 31,2053 00707 1 V67FLAG

4224 31,2054 62056 0 +2

4225 REF 34 LAST 611 31,2055 1 5472 1 TCF ENDFXT

4226 31,2056 77745 1 CLEAR

SAVE THE PRESENT NS9 VALUES FOR
COMPARISON AFTER THE DISPLAY

THE SUM OF ALL DIFFERENCES MUST BE ZERO.

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4277					31,2141	77650 1		GOTC	
4278	REF	1			31,2142	60002 0		ADDPQS	
4279					31,2143	01543 1	VC6N95	VN	J699
4281	REF	1			30,2100			SETLCC	VB67A
4281					30,2102			FANK	
4282	REF	1						CCUNT#	\$/EXTVE
4283					30,2112	77615 0	ADDPQS	DAD	
4284	REF	9	LAST	612	30,2103	02201 0		WWPCS	
4285	REF	10	LAST	612	30,2104	02201 0		STORE	WWPCS
4286					30,2105	47573 0		VLOAD*	VSO
4287	REF	16	LAST	612	30,2106	02555 0			W +1080,1
4288					30,2107	77615 0		DAD	
4289	REF	5	LAST	612	30,2110	02203 1			WWVEL
4290	REF	6	LAST	612	30,2111	02203 1		STORE	WWVEL
4291					30,2112	47573 0		VLOAD*	VSO
4292	REF	17	LAST	612	30,2113	02643 1			W +1620,1
4293					30,2114	77615 0		DAD	
4294	REF	8	LAST	612	30,2115	02205 1			WWRIAS
4295	REF	9	LAST	612	30,2116	02205 1		STORE	WWRIAS
4296					30,2117	75500 0		TIX,1	SQRT
4297	REF	1			30,2120	62137 0			NXPDSVEL
4298					30,2121	77661 0		SR	
4299					30,2122	20613 1			100
4300	REF	10	LAST	612	30,2123	16205 1		STORE	WWRIAS
4301	REF	7	LAST	612	30,2124	02203 1			WWVEL
4302					30,2125	77766 0		SQRT	
4303	REF	8	LAST	612	30,2126	16203 1		STORE	WWVEL
4304	REF	11	LAST	612	30,2127	02201 0			WWPCS
4305					30,2131	77766 0		SQRT	
4306	REF	12	LAST	612	30,2131	02201 0		STORE	WWPCS
4307					30,2132	52001 0		BNV	GCTC
4308					30,2133	60035 1			+2
4309	REF	1			30,2134	60042 1			V67XXX
4310					30,2135	77745 1		DLOAD	
4311	REF	4	LAST	379	30,2136	06532 0			DPFQSMAX
4312	REF	13	LAST	612	30,2137	02201 0		STORE	WWPCS
4313	REF	9	LAST	612	30,2140	02203 1		STORE	WWVEL
4314	REF	11	LAST	612	30,2141	02205 1		STORE	WWRIAS
4315					30,2142	45345 1	V67XXX	DLOAD	DSU
4316	REF	14	LAST	612	30,2143	02201 0			WWPCS
4317	REF	1			30,2144	20060 0			FT99999
4318					30,2145	71241 1		BMN	DLOAD
4319					30,2146	60051 0			+3
4320	REF	2	LAST	612	30,2147	20060 0			FT99999
4321	REF	15	LAST	612	30,2150	02201 0		STORE	WWPCS
4322					30,2151	66150 0		LXA,1	SXA,1
4323	REF	6	LAST	612	30,2152	00051 0			S2
4324	REF	2	LAST	299	30,2153	00052 0			QPRFT

 SHIFT FROM INTERNAL SCALING (R+E) TO
 NOUN SCALING (R-E)

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4325					30,2054	77776	1		EXIT	
4326	REF	30	LAST	567	30,2055	0 4635	0		TC	PESTJUMP
4327	REF	2	LAST	299	30,2056	27423	1		CADR	INTWAKE
4328					31,2057	01670	1	FT99999	2DEC	30479 B-19
4328					30,2060	17000	1			

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P4320

4330 REF 3 LAST 557 25,3572 BANK 25

4331 REF 3 LAST 557 25,3572 SETLCC RADAPUPT

4332 REF 3 LAST 557 25,3572 BANK

4333 REF 3 LAST 557 TO 565: 237 240* COLINT* \$\$/RRUPT

4334 REF 29 LAST 608 57,1456 FRANK= LNSCOUNT

4346 REF 28 LAST 558 25,3572 4 4747 E RADLITES CS RITS

4347 REF 28 LAST 561 25,3573 6 0061 0 AC ITEMPI

4348 REF 214 LAST 611 25,3574 10 000 0 CCS A

4349 REF 79 LAST 609 25,3575 4 4752 0 CS CNE

4350 REF 1 25,3576 1 3625 1 TCF VLIGHT

4351 REF 1 25,3577 1 4570 0 TCF RRTKKE

4352 REF 4 LAST 258 25,3600 54 065 0 FLIGHT TS ITEMPS ZERO ITEMPS FOR H INDEX

4353 REF 1 25,3611 3 4747 1 CA HLITE

4354 REF 93 LAST 611 25,3612 54 001 1 TS L

4355 REF 1 25,3613 3 4747 1 CA LRALTBIT

4360 REF 112 LAST 618 25,3614 7 0110 0 BCTHLITS MASK RADMCES

4361 REF 215 LAST 615 25,3615 10 000 0 CCS A

4362 REF 1 25,3616 1 0620 1 TCF ONLITES

4363 REF 4 LAST 557 25,3617 3 0107 1 CA FLGWED11

4364 REF 5 LAST 615 25,3618 50 065 1 INDEX ITEMPS

4365 REF 1 25,3619 7 4753 0 MASK FFLSHBIT

4366 REF 216 LAST 615 25,3620 10 000 0 CCS A

4367 REF 2 LAST 615 25,3621 1 4570 0 TCF RRTKKE

4368 REF 1 25,3614 1 0606 1 LITIT EXTEND

4369 REF 3 LAST 181 25,3615 22 066 1 QXCH ITEMPA

4370 REF 2 LAST 526 25,3616 0 4602 1 TC TRKFELCN +1

4371 REF 4 LAST 615 25,3617 0 0666 1 TC ITEMPS

4374 REF 5 LAST 615 25,3622 50 065 1 ONLITES INDEX ITEMPS

4375 REF 2 LAST 615 25,3621 4 4753 0 CS FFLSHBIT

4376 REF 5 LAST 615 25,3622 7 0107 0 MASK FLGWED11

4377 REF 6 LAST 615 25,3623 54 107 0 TS FLGWRD11

4378 REF 54 LAST 615 25,3624 3 0601 0 CA L

4379 REF 1 25,3625 1 3614 0 TCF LITIT

4380 REF 7 LAST 615 25,3626 54 065 0 VLIGHT TS ITEMPS

4381 REF 1 25,3627 3 4751 0 CA VLITE

4382 REF 95 LAST 615 25,3630 54 001 1 TS L

4383 REF 27 LAST 558 25,3631 3 4744 1 CA BIT8

4384 REF 1 25,3632 1 3604 1 TCF BCTHLITS

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438F	DEF	29	LAST	615	4747	HLITF	EQUALS	BIT5
4386	DEF	30	LAST	572	4751	VLITF	EQUALS	BIT3

*** END OF LEMP20S .140 ***

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R0022 PROGRAM DESCRIPTION P30 DATE 3-6-67

R0024 MOD.1 BY RAMA AIYAWAR

R0025 FUNCTIONAL DESCRIPTION

R0026 ACCEPT ASTRONAUT INPUTS OF TIG, DELV(LV)

R0027 CALL IMU STATUS CHECK ROUTINE (R02)

R0028 DISPLAY TIME TO GO, APCGEE, PERIGEE, DELV(MAG), MAG AT IGN

R0029 REQUEST OPEN PROGRAM

R0030 CALLING SEQUENCE VIA JOB FROM V37

R0031 EXIT VIA V37 (CALL CR TO COTOPOCH (V34F))

R0032 SUBROUTINE CALLS-FLAGUP, PHASCHNG, BANKCALL, ENDGFJOB, GDFLASH, GCFLASHR

R0033 GCPEEFS, INTPRET, BLANKET, COTOPOCH, P02PCTH, S30.1,

R0034 TTG/M35, MIOGIM, DISPMGA

R0035 ERASABLE INITIALIZATION- STATE VECTOR

R0036 OUTPLT-RINIT, VINIT, +MGA, VTIG, RTIG, DELVSI, DELVSP, DELVSLV, EAPD,

R0037 EPEP, TTCC

R0038 DERRIS- A,L, MPAC, FLSHLIST

R0381					35,2777				BANK	32	
R0382	REF	1			35,2777				SETLCG	P30S	
R0383					35,2777				BANK		
R0384	REF	2	LAST	315	35,2777				EBANK=	+MGA	
R0389	REF	1							COUNT#	11/P30	
R0400	REF	26	LAST	611	35,2777	0	5504	0	P30	TC	UPFLAG
R0401	REF	3	LAST	497	35,2777	0	5504	1	ADRES	UPDATFLG	SET UPDATE FLAG
R0411	REF	37	LAST	617	35,2777	0	5504	0	TC	UPFLAG	SET TRACK FLAG
R0412	REF	4	LAST	504	35,2777	0	5504	0	ADRES	TRACKFLG	
R042	REF	1			35,2777	3	2732	1	P30N33	CAF	VC6N33
R043	REF	1			35,2777	0	3621	1	TC	VNPOOH	T OF IGN
											RETURNS ON PROCEED, POCH ON TERMINATE
R051	REF	1			35,2777	3	3636	1	CAF	VC6N81	DISPLAY DELTA V (LV)
R052	REF	2	LAST	617	35,2777	0	3621	1	TC	VNPOOH	REDISPLAY ON RECYCLE
R057	REF	63	LAST	609	35,2777	0	5516	0	TC	DCWFLAG	RESET UPDATE FLAG
R058	REF	4	LAST	617	35,2777	0	5516	1	ADRES	UPDATFLG	
R059	REF	62	LAST	611	35,2777	0	6042	1	TC	INTPRET	
R060					35,2777		77624	1	CALL		
R061	REF	1			35,2777		77776	0		S30.1	
R067	*				35,2777	43014	0		SET	SET	
R0675	REF	5	LAST	617	35,2777	0	470	1		UPDATFLG	
R0676	*REF	1			35,2777	0	1067	1		XDELVFLG	
R0677	*				35,2777	77776	1		EXIT		
R068	REF	1			35,2777	3	2032	0	PARAM30	CAF	V16N42
											DISPLAY APCGEE, PERIGEE, DELTA V

L PRC,F37

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0065	REF	2	LAST	617	35,2022	0 2621 1	TC	VNF00F
0070	REF	63	LAST	617	35,2023	0 4042 1	TC	INTPRET
0071	*				35,2024	77614 1	SFT	
0072	*PRF	1			35,2025	01771 0		FINALFLG
0074					35,2026	77624 1	REVN1645	CALL
0075	PRF	1			35,2027	73515 1		VN1645
0076					35,2030	77650 1	CCTC	
0077	REF	1			35,2031	72026 0		REVN1645
0100					35,2032	01441 1	VC6N33	VN 0633
0102					35,2033	01452 0	VC6N42	VN 0642

CCNES FFRF CN RECYCLE RESPONSE

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P0105	PROGRAM DESCRIPTION S30.1		DATE SN0V66		
R0106	MOD NO 1		LTC SECTION F30,F37		
R0107	MOD BY RAMA ATYAWAP **				
P0108	FUNCTIONAL DESCRIPTION				
R0109	BASED ON STICKED TARGET PARAMETERS (R OF IGNITION (RTIG), V OF				
R0110	IGNITION (VTIG), TIME OF IGNITION (TIG)), COMPLETE PERIGEE ALTITUDE				
R0111	APOGEE ALTITUDE AND DELTA-V REQUIRED (DELVSIN).				
R0112	CALLING SEQUENCE				
R0113	1 CALL				
R0114	1+1 S30.1				
P0115	NORMAL EXIT MODE				
R0116	AT L+2 OR CALLING SEQUENCE (GCTC L+2)				
R0117	SUBROUTINES CALLED				
P0118	LEMPREC				
R0119	PERTAPC				
R0120	ALARM OR ABORT EXIT MODES				
P0121	ACNF				
R0122	ERASABLE INITIALIZATION REQUIRED				
P0123	TIG	TIME OF IGNITION	CP	E28CS	
R0124	DELVSIN	SPECIFIED DELTA-V IN LOCAL VERT.			
R0125		COORDS. OF ACTIVE VEHICLE AT			
P0126		TIME OF IGNITION	VECTOR	B+7 METERS/CS	
R0127	CLTPLT				
R0128	RTIG	POSITION AT TIG	VECTOR	B+29 METERS	
R0129	VTIG	VELOCITY AT TIG	VECTOR	B+29 METERS/CS	
R0130	PCL 4C	APOGEE ALTITUDE	CP	B+29 M , B+27 METERS.	
R01301	PAPO	APOGEE ALTITUDE	CP	B+29 METERS	
R0131	PCL 8C	PERIGEE ALTITUDE	CP	B+29 M , B+27 METERS.	
R01311	HPER	PERIGEE ALTITUDE	CP	B+29 METERS	
R0132	DELVSIN	SPECIFIED DELTA-V IN INERTIAL			
R0133		COORDS. OF ACTIVE VEHICLE AT			
R0134		TIME OF IGNITION	VECTOR	B+7 METERS/CS	
P0135		DELVSIN MAG. OF DELVSIN	VECTOR	B+7 METERS/CS	
R0136	DEBRIS QTEMP	TEMP. ERASABLE			
R0137	QPRET, MPAC				
R0138	PUSHLIST				
0139	REF	1	34,200		SETLOC P30S1
0140			34,200		BANK
0141	REF	1			COUNT* 11/S30S
0142			34,2000	71220 1	S30.1
0143	REF	1	34,200	12622 0	STG
0144	REF	9	LAST 495	34,2102	03442 0
0145	REF	21	LAST 592	34,2013	34041 0
0146	REF	3	LAST 208	34,2014	27060 1
					TIME IGNITION SCALED AT 2(+28)CS
					STCALL TREF1
					LEMPREC
					ENCKE ROUTINE FOR LEM
0147			34,2005	67175 0	VLCAD SXA,2

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01471	REF	1	LAST	592	34,2006	00001 0	PATT	
0148	REF	1			34,2007	02777 1	RTX2	
0150	REF	2	LAST	143	34,2010	03642 1	RTIG	RADIUS VECTOR AT IGNITION TIME
0153					34,2011	57456 1	UNIT	VCOMP
0154	REF	3	LAST	144	34,2012	27656 1	STCVL	DELVSIN
0155	REF	6	LAST	592	34,2013	00007 0	VATT	ZRF/LV IN DELVSIN SCALED AT 2
0156	REF	2	LAST	143	34,2014	03650 1	STORE	VTIG
0158					34,2015	53435 0	VXV	UNIT
0159	REF	3	LAST	620	34,2016	03642 1	RTIG	VELOCITY VECTOR AT TIG, SCALED 2(7) M/CS
0160					34,2017	66001 0	SFTPD	SXA, 1
0161					34,2020	00001 0		0
01611	REF	2	LAST	125	34,2021	02776 0		PTX1
0162					34,2022	47206 0	PLSF	VXV
0163	REF	4	LAST	620	34,2023	02656 1		DELVSIN
0164					34,2024	63372 1	VSL1	PDVL
0165					34,2025	63315 0	PDVL	PDVL
0166	REF	5	LAST	620	34,2026	03656 1		DELVSIN
0167	REF	2	LAST	155	34,2027	03434 1		DELVSLV
0168					34,2030	76505 0	VXM	VSL1
0169					34,2031	00001 0		0
0170	REF	6	LAST	620	34,2032	02656 1	STORE	DELVSIN
0172					34,2033	77646 0	ABVAL	
0173	REF	2	LAST	143	34,2034	27664 0	STCVL	DELVSAB
0174	REF	4	LAST	620	34,2035	03642 1		RTIG
0175					34,2036	53315 0	PDVL	VAD
0176	REF	3	LAST	620	34,2037	03650 1		VTIG
0177	REF	7	LAST	620	34,2040	03656 1		DELVSIN
01771					34,2041	77624 1	CALL	
0178	REF	1			34,2042	46341 0		PERIAPD1
01781					34,2043	77624 1	CALL	
01782	REF	1			34,2044	46451 0		SHIFTD1
017822					34,2045	77624 1	CALL	
017824	REF	1			34,2046	45636 0		MAXCHK
01783	REF	2	LAST	315	34,2047	16321 0	STCDL	HPFR
01784					34,2050	00005 1		40
01785					34,2051	77624 1	CALL	
01786	REF	2	LAST	620	34,2052	46451 0		SHIFTD1
01787					34,2053	77624 1	CALL	
01788	REF	2	LAST	620	34,2054	45636 0		MAXCHK
0179	REF	4	LAST	315	34,2055	36317 1	STCALL	HAPC
0180	REF	2	LAST	619	34,2056	03632 0		QTMP

APGEE ALT 2(29) METERS, FOR DISPLAY

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P0010 COELLIPTIC SEQUENCE INITIATION (CSI) PROGRAMS (P32 AND P72)

R0011 MOD NO -1 LDC SECTION - P32-P35, P72-P75

R0012 MOD BY WHITE,P DATE 1JUN67

R0013 FLEPOST

R0014 (1) TO CALCULATE PARAMETERS ASSOCIATED WITH THE FOLLOWING
R0015 CONCENTRIC FLIGHT PLAN MANEUVERS - THE CO-ELLIPTIC SEQUENCE
R0016 INITIATION (CSI) MANEUVER AND THE CONSTANT DELTA ALTITUDE
R0017 (CDH) MANEUVER.

R0018 (2) TO CALCULATE THESE PARAMETERS BASED UPON MANEUVER DATA
R0019 APPROVED AND KEYED INTO THE DSKY BY THE ASTRONAUT.

R0020 (3) TO DISPLAY TO THE ASTRONAUT AND THE GROUND DEPENDENT VARIABLES
R0021 ASSOCIATED WITH THE CONCENTRIC FLIGHT PLAN MANEUVERS FOR
R0022 APPROVAL BY THE ASTRONAUT/GROUND.

R0023 (4) TO STORE THE CSI TARGET PARAMETERS FOR USE BY THE DESIRED
R0024 THRUSTING PROGRAM.

R0025 ASSUMPTIONS

R0026 (1) AT A SELECTED TPI TIME THE LINE OF SIGHT BETWEEN THE ACTIVE
R0027 AND PASSIVE VEHICLES IS SELECTED TO BE A PRESCRIBED ANGLE (θ)
R0028 FROM THE HORIZONTAL PLANE DEFINED BY THE ACTIVE VEHICLE
R0029 POSITION.

R0029 (2) THE TIME BETWEEN CSI IGNITION AND CDH IGNITION MUST BE
R0030 COMPUTED TO BE GREATER THAN 10 MINUTES FOR SUCCESSFUL
R0031 COMPLETION OF THE PROGRAM.

R0032 (3) THE TIME BETWEEN CDH IGNITION AND TPI IGNITION MUST BE
R0033 COMPUTED TO BE GREATER THAN 10 MINUTES FOR SUCCESSFUL
R0034 COMPLETION OF THE PROGRAM.

R0035 (4) CDH DELTA V IS SELECTED TO MINIMIZE THE VARIATION OF THE
R0036 ALTITUDE DIFFERENCE BETWEEN THE ORBITS.

R0037 (5) CSI PURN IS DEFINED SUCH THAT THE IMPULSIVE DELTA V IS IN THE
R0038 HORIZONTAL PLANE DEFINED BY THE ACTIVE VEHICLE POSITION AT CSI
R0039 IGNITION.

R0039 (6) THE PERICENTRE ALTITUDE OF THE ORBIT FOLLOWING CSI AND CDH
R0040 MUST BE GREATER THAN 35,000 FT (LUNAR ORBIT) OR 85 NM (EARTH
R0041 ORBIT) FOR SUCCESSFUL COMPLETION OF THIS PROGRAM.

R0042 (7) THE CSI AND CDH MANEUVERS ARE ORIGINALLY ASSUMED TO BE
R0043 PARALLEL TO THE PLANE OF THE CSN ORBIT. HOWEVER CREW

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R0044 MODIFICATION OF DELTA V (ΔV) COMPONENTS MAY RESULT IN AN
R0045 CUT-OF-PLANE CSI MANEUVER.

R0046 (8) STATE VECTOR UPDATES BY P27 ARE DISALLOWED DURING AUTOMATIC
R0047 STATE VECTOR UPDATING INITIATED BY P20 (SEE ASSUMPTION 10).

R0048 (9) COMPUTER VARIABLES MAY BE STORED FOR LATER VERIFICATION BY
R0049 THE GROUND. THESE STORAGE CAPABILITIES ARE NORMALLY LIMITED
R0050 ONLY TO THE PARAMETERS FOR ONE THRUSTING MANEUVER AT A TIME
R0051 EXCEPT FOR CONCENTRIC FLIGHT PLAN MANEUVER SEQUENCES.

R0052 (10) THE RENDEZVOUS RADAR MAY OR MAY NOT BE USED TO UPDATE THE LM
R0053 OR CSM STATE VECTORS FOR THIS PROGRAM. IF RADAR USE IS
R0054 DESIRED THE RADAR WAS TURNED ON AND LOCKED ON THE CSM BY
R0055 PREVIOUS SELECTION OF P20. RADAR SIGHTING MARKS WILL BE MADE
R0056 AUTOMATICALLY APPROXIMATELY ONCE A MINUTE WHEN ENABLED BY THE
R0057 TRACK AND UPDATE FLAGS (SEE P20). THE RENDEZVOUS TRACKING
R0058 MARK COUNTER IS ZEROED BY THE SELECTION OF P20 AND AFTER EACH
R0059 THRUSTING MANEUVER.

R0060 (11) THE ISS NEED NOT BE ON TO COMPLETE THIS PROGRAM.

R0061 (12) THE OPERATION OF THE PROGRAM UTILIZES THE FOLLOWING FLAGS -

R0062 ACTIVE VEHICLE FLAG - DESIGNATES THE VEHICLE WHICH IS
R0063 BEING RENDEZVOUS THRUSTING MANEUVERS TO THE PROGRAM WHICH
R0064 CALCULATES THE MANEUVER PARAMETERS. SET AT THE START OF
R0065 EACH RENDEZVOUS PRE-THRUSTING PROGRAM.

R0066 FINAL FLAG - SELECTS FINAL PROGRAM DISPLAYS AFTER CREW HAS
R0067 COMPLETED THE FINAL MANEUVER COMPUTATION AND DISPLAY
R0068 CYCLE.

R0069 EXTERNAL DELTA V STEERING FLAG - DESIGNATES THE TYPE OF
R0070 STEERING REQUIRED FOR EXECUTION OF THIS MANEUVER BY THE
R0071 THRUSTING PROGRAM SELECTED AFTER COMPLETION OF THIS
R0072 PROGRAM.

R0073 (13) IT IS NORMALLY REQUIRED THAT THE ISS BE ON FOR 1 HOUR PRIOR TO
R0074 A THRUSTING MANEUVER.

R0075 (14) THIS PROGRAM IS SELECTED BY THE ASTRONAUT BY DSKY ENTRY -

R0076 P32 IF THIS VEHICLE IS ACTIVE VEHICLE.

R0077 P72 IF THIS VEHICLE IS PASSIVE VEHICLE.

R0110 INPUT

R0111 (1) TCSI TIME OF THE CSI MANEUVER

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R0112 (2) NN NUMBER OF APSICAL CROSSINGS THRU WHICH THE ACTIVE
 R0113 VEHICLE ORBIT CAN BE ADVANCED TO OBTAIN THE CCH
 R0114 MANEUVER POINT
 R0115 (3) ELFV DESIRED LOS ANGLE AT TPI
 R0116 (4) TTPI TIME OF THE TPI MANEUVER
 R013 OUTPUT

R0131 (1) TRKMKCNT NUMBER OF MARKS
 R0132 (2) TTGO TIME TO GO
 R0133 (3) 4MCA MIDDLE GIMBAL ANGLE
 R0134 (4) DIFFALT DELTA ALTITUDE AT CCH
 R0135 (5) TTOT2 DELTA TIME FROM CSI TO CCH
 R0136 (6) T2TOT3 DELTA TIME FROM CCH TO TPI
 R0137 (7) DELVLVC DELTA VELOCITY AT CSI - LOCAL VERTICAL COORDINATES
 R0138 (8) DELVLVC DELTA VELOCITY AT CCH - LOCAL VERTICAL COORDINATES

R0139 CCKALINK

R01391 (1) TCSI TIME OF THE CSI MANEUVER
 R01392 (2) TCOF TIME OF THE CCH MANEUVER
 R01393 (3) TTPI TIME OF THE TPI MANEUVER
 R01394 (4) TTG TIME OF THE CSI MANEUVER
 R01395 (5) DELVFEFT1 DELTA VELOCITY AT CSI - REFERENCE COORDINATES
 R01396 (6) DELVFEFT2 DELTA VELOCITY AT CCH - REFERENCE COORDINATES
 R01397 (7) DIFFALT DELTA ALTITUDE AT CCH
 R01398 (8) NN NUMBER OF APSICAL CROSSINGS THRU WHICH THE ACTIVE
 R01399 VEHICLE ORBIT CAN BE ADVANCED TO OBTAIN THE CCH
 R014 MANEUVER POINT
 R01401 (9) ELFV DESIRED LOS ANGLE AT TPI

R01402 COMMUNICATION TO THRUSTING PROGRAMS

R01403 (1) TIC TIME OF THE CSI MANEUVER
 R01404 (2) RTIC POSITION OF ACTIVE VEHICLE AT CSI - BEFORE ROTATION
 R01405 INTO PLANE OF PASSIVE VEHICLE
 R01406 (3) VTIC VELOCITY OF ACTIVE VEHICLE AT CSE - BEFORE ROTATION
 R01407 INTO PLANE OF PASSIVE VEHICLE
 R01408 (4) DELVSTA DELTA VELOCITY AT CSI - REFERENCE COORDINATES
 R01409 (5) DELVSAR MAGNITUDE OF DELTA VELOCITY AT CSI
 R0141 (6) XDELVFLG SET TO INDICATE EXTERNAL DELTA VELOCITY COMPUTATION

R0150 SUBROUTINES USED

R0151 AVFLAG
 R0152 AVELAGP
 R01525 F20FIGCN
 R0153 VARALARM
 R0154 BANKCALL
 R0155 OCFLASH
 R0156 COTOPCCH

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R01562 VAPCOH
 R01564 GCFLASH
 R0157 BLANKET
 R0158 FNDQFJNR
 R0159 SELECTMU
 R0160 ADVANCE
 R0161 INTINT
 R0162 PASSIVE
 R0163 CSI/1
 R0164 S22/33.1
 R0165 ETSFVLVC
 R0166 VNI645

0400				35,2034			BANK 35
0401	REF	1		35,2034			SETLCC CSI/CDH
0402				35,2034			BANK
0403	REF	1		57,1471			EBANK= SUBEXIT
0404	REF	1					CCUNT# 11/P3272
0500	REF	1		35,2034	0 2354	1 P32	TC AVFLAGA
0502	REF	1		35,2035	0 2037	1	TC P32STR
0503	REF	1		35,2036	0 2361	1 P72	TC AVFLACP
050305				35,2037	0 0006	1 P32STR	EXTEND
050306	REF	1		35,2040	3 2425	0	DCA P30ZERO
050307	REF	3	LAST 316	35,2041	53 621	1	DXCF CENTANG
05031	REF	1		35,2042	0 2060	0	TC P32/P72A
05032				35,2043	77734	1 ALMX1TA	SXA,2
05033	REF	2	LAST 142	35,2044	03613	0	CSIALFM
05034				35,2045	77740	1 ALMX1T	LXC,1
05035	REF	3	LAST 624	35,2046	03613	0	CSIALFM
05038				35,2047	77522	1	SLCAD# EXIT
05039	REF	1		35,2050	32430	1	ALARM/TB -1,1
0504	REF	2P4	LAST 609	35,2051	3 0154	1	CA MPAC
05041	REF	3	LAST 389	35,2052	5734	1	TC VAFALARM
05042	REF	1		35,2053	3 5006	1	CAF V05N05
05043	REF	164	LAST 611	35,2054	0 4616	1	TC BANKCALL
05044	REF	8	LAST 495	35,2055	20477	1	CADR GCFLASH
05045	REF	6	LAST 495	35,2056	0 6001	0	TC GETOPCOH
05046				35,2057	0 2052	0	TC -4
0505	REF	1		35,2060	0 2366	0 P32/P72A	TC P20FLCON
05051	REF	2	LAST 624	35,2061	3 2424	1	CAF P30ZERO
0506	REF	3	LAST 316	35,2062	55 467	1	TS NN +1
05061	REF	4	LAST 206	35,2063	55 633	1	TS TCSI
05062	REF	5	LAST 624	35,2064	55 634	0	TS TCSI +1
0507	REF	1		35,2065	3 2415	0 VN0611	CAF V06N11 TCSI
0508	REF	4	LAST 618	35,2066	0 3621	1	TC VNPOCH
050801	REF	64	LAST 618	35,2067	0 6042	1	TC INTERPRET
050802				35,2070	57545	1	ELCAD DCGMP
050803	REF	6	LAST 624	35,2071	03634	0	TCSI
050804				35,2072	71240	1	BMN ELCAD
050805	REF	1		35,2073	72120	1	VND655

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050806	REF	2	LAST	502	35,2074	01643	1		TETLEM
050807	REF	22	LAST	619	35,2075	34741	0	STCALL	TFCF1
050808	REF	1			35,2076	46443	1		PRECSET
050809					35,2077	52775	1	VLCAD	VSE#
050810	REF	1			35,2100	02526	1		RACT3
050811					35,2101	57176	0		C,2
050812	REF	2	LAST	496	35,2102	26655	0	STOVL	RVFC
050813	REF	2	LAST	142	35,2103	02544	1		VACT3
050814					35,2104	43057	1	VSR#	SET
050815					35,2105	57175	0		0,2
050816	REF	2	LAST	496	35,2106	03466	1		RVSU
050817	REF	3	LAST	496	35,2107	16744	1	STOVL	VVEC
050818	REF	5	LAST	612	35,2110	06532	0		DEFSMAX
050819	REF	2	LAST	126	35,2111	36756	0	STCALL	DESIRED
050820	REF	1			35,2112	25557	1		TIMEPAD
050821					35,2113	77615	0	CAC	
050822	REF	1			35,2114	03574	1		TDFC2
050823	REF	7	LAST	624	35,2115	03634	0	STCRE	TCSI
050824					35,2116	77776	1	EXIT	
050825	REF	1			35,2117	02165	0	TC	VNF611
050826					35,2121	77775	1	EXIT	
0509	REF	1			35,2121	32623	1	CAF	VCAF55
0510	REF	165	LAST	624	35,2122	04616	1	TC	BANKCALL
0511	REF	9	LAST	624	35,2123	20477	1	CACR	GCFLASH
0512	REF	7	LAST	624	35,2124	06101	0	TC	GETOPCOH
0513					35,2125	02127	1	TC	+2
0514					35,2126	02121	1	TC	-5
0518	REF	1			35,2127	33632	0	CAF	VCAF37
0519	REF	5	LAST	624	35,2130	03621	1	TC	VNPOH
0520	REF	65	LAST	624	35,2131	06042	1	TC	INTPRET
0521					35,2132	77745	1	ELCAD	
0522	REF	8	LAST	625	35,2133	03634	0		TCSI
0523	REF	10	LAST	619	35,2134	37442	1	STCALL	TIG
0524	REF	1			35,2135	20000	0		SELECTMU
0525					35,2136	77624	1	P32/P72B CALL	
0526	REF	1			35,2137	71016	0		ADVANCE
0527					35,2140	77201	1	SETPD	VLCAD
0528					35,2141	00001	0		00
0529	REF	3	LAST	145	35,2142	03506	1		VPASS1
0530					35,2143	65215	0	FDVL	PDCL
0531	REF	2	LAST	142	35,2144	03500	1		RPASS1
0532	REF	5	LAST	625	35,2145	03634	0		TCSI
0533					35,2146	65325	0	PDCL	PDCL
0534	REF	4	LAST	307	35,2147	03636	1		TTPI
0535	REF	1			35,2150	33641	1		TWPI
0536					35,2151	45006	0	PLSH	CALL
0537	REF	1			35,2152	73370	1		INTINT
0538					35,2153	77624	1	CALL	
0539	REF	1			35,2154	46435	1		PASSIVE
0540					35,2155	77524	1	CALL	

NN, ELEV(PGLCS)

TTPI

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0541	REF.	1		35,2154	77113 0		CS1/A
0542				35,2157	43014 0	P32/P72C FCN	SET
0543	REF	2	LAST	618	01311 0		FINALFLG
0544	REF	1		35,2161	72163 0		P32/P72D
0545	REF	6	LAST	617	01471 1		UPDATFLG
0546				35,2162	77745 1	P32/P72D CLCAD	
0547	REF	3	LAST	317	02253 1		T1TOT2
0548	REF	4	LAST	626	02253 1	P32/P72E STORE	T1TCT2
0549				35,2166	51125 1	DSU	BPL
0550	REF	1		35,2167	32427 1		60MIN
0551	REF	1		35,2170	72165 0		P32/P72E
0552				35,2171	77745 1	CLCAD	
0553	REF	2	LAST	317	02255 1		T2TOT3
0554	REF	3	LAST	626	02255 1	P32/P72F STORE	T2TOT3
0555				35,2174	51125 1	DSU	BPL
0556	REF	2	LAST	626	35,2175		60MIN
0557	REF	1		35,2176	72173 1		P32/P72F
0558				35,2177	77776 1	EXIT	
0559	REF	1		35,2200	2 2417 1	CAF	VC6N75
0560	REF	6	LAST	625	0 3621 1	TC	VNPOOH
0561	REF	66	LAST	625	0 6142 1	TC	INTPRET
0562				35,2203	45175 0	VLQAD	CALL
0563	REF	3	LAST	199	02267 0		DELVEFT1
0566	REF	1		35,2205	71100 0		S32/33.1
0567	REF	4	LAST	626	26267 0	STCVL	DELVEFT1
05671	REF	2	LAST	118	02311 0		RACT2
05672	REF	2	LAST	118	26303 0	STCVL	RACT1
0568	REF	3	LAST	199	02275 0		DELVEFT2
0569				35,2212	45170 0	AXT,1	CALL
05691				35,2213	01522 0	VN	06H2
0572	REF	1		35,2214	72375 0		DISOVLVC
0573				35,2215	77745 1	CLCAD	
05731	REF	5	LAST	625	03656 1		TTP1
05732	REF	1		35,2217	37640 1	STCALL	TTP10
0574	REF	2	LAST	618	73515 1		VN1645
0575				35,2221	77650 1	GOTO	
0576	REF	1		35,2222	72136 0		P32/P72E

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PIC10 CONSTANT DELTA HEIGHT (CDH) PROGRAMS (P33 AND P73)

R1011 MCD NO -1 LOC SECTION - P32-P35, P72-P75

R1012 MCD BY WHITE.P DATE 1JUNE67

R1013 PURPOSE

R1014 (1) TO CALCULATE PARAMETERS ASSOCIATED WITH THE CONSTANT DELTA
R1015 ALTITUDE MANUEVER (CDH).

R1016 (2) TO CALCULATE THESE PARAMETERS BASED UPON MANUEVER DATA
R1017 APPROVED AND KEYED INTO THE DSKY BY THE ASTRONAUT.

R1018 (3) TO DISPLAY TO THE ASTRONAUT AND THE GROUND DEPENDENT VARIABLES
R1019 ASSOCIATED WITH THE CDH MANUEVER FOR APPROVAL BY THE
R1020 ASTRONAUT/COMAND.

R1021 (4) TO STORE THE CDH TARGET PARAMETERS FOR USE BY THE DESIRED
R1022 THRUSTING PROGRAM.

R1023 ASSUMPTIONS

R1024 (1) THIS PROGRAM IS BASED UPON PREVIOUS COMPLETION OF THE
R1025 CO-ELLIPTIC SEQUENCE INITIATION (CSI) PROGRAM (P32/P72).
R1026 THEREFORE -

R1027 (A) AT A SELECTED TPI TIME (NOW IN STORAGE) THE LINE OF SIGHT
R1028 BETWEEN THE ACTIVE AND PASSIVE VEHICLES WAS SELECTED TO BE
R1029 A PRESCRIBED ANGLE (S) (NOW IN STORAGE) FROM THE
R1030 HORIZONTAL PLANE DEFINED BY THE ACTIVE VEHICLE POSITION.

R1031 (B) THE TIME BETWEEN CSI IGNITION AND CDH IGNITION WAS
R1032 COMPUTED TO BE GREATER THAN 10 MINUTES.

R1033 (C) THE TIME BETWEEN CDH IGNITION AND TPI IGNITION WAS
R1034 COMPUTED TO BE GREATER THAN 10 MINUTES.

R1035 (D) THE VARIATION OF THE ALTITUDE DIFFERENCE BETWEEN THE
R1036 ORBITS WAS MINIMIZED.

R1037 (E) CSI BURN WAS DEFINED SUCH THAT THE IMPULSIVE DELTA V WAS
R1038 IN THE HORIZONTAL PLANE DEFINED BY ACTIVE VEHICLE

R1039 POSITION AT CSI IGNITION.

R1039 (F) THE PERICENTER ALTITUDES OF THE ORBITS FOLLOWING CSI AND
R1040 CDH WERE COMPUTED TO BE GREATER THAN 35,000 FT FOR LUNAR
R1041 ORBIT OR 85 NM FOR EARTH ORBIT.

R1042 (G) THE CSI AND CDH MANEUVERS WERE ASSUMED TO BE PARALLEL TO
R1043 THE PLANE OF THE PASSIVE VEHICLE ORBIT. HOWEVER, CREW

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R1044 MODIFICATION OF DELTA V (LV) COMPONENTS MAY HAVE RESULTED
R1045 IN AN CLT-OF-PLANE MANEUVER.

R1046 (2) STATE VECTOR UPDATES BY P27 ARE DISALLOWED DURING AUTOMATIC
R1047 STATE VECTOR UPDATING INITIATED BY P20 (SEE ASSUMPTION 4).

R1048 (3) COMPUTED VARIABLES MAY BE STORED FOR LATER VERIFICATION BY
R1049 THE GROUND. THESE STORAGE CAPABILITIES ARE NORMALLY LIMITED
R1050 ONLY TO THE PARAMETERS FOR ONE THRUSTING MANEUVER AT A TIME
R1051 EXCEPT FOR CONCENTRIC FLIGHT PLAN MANEUVER SEQUENCES.

R1052 (4) THE RENDEZVOUS RADAR MAY OR MAY NOT BE USED TO UPDATE THE LM
R1053 OR CSM STATE VECTORS FOR THIS PROGRAM. IF RADAR USE IS
R1054 DESIRED THE RADAR WAS TURNED ON AND LOCKED ON THE CSM BY
R1055 PREVIOUS SELECTION OF P20. RADAR SIGHTING MARKS WILL BE MADE
R1056 AUTOMATICALLY APPROXIMATELY ONCE A MINUTE WHEN ENABLED BY THE
R1057 TRACK AND UPDATE FLAGS (SEE P20). THE RENDEZVOUS TRACKING
R1058 MARK COUNTER IS ZEROED BY THE SELECTION OF P20 AND AFTER EACH
R1059 THRUSTING MANEUVER.

R1060 (5) THE ISS NEED NOT BE ON TO COMPLETE THIS PROGRAM.

R1061 (6) THE OPERATION OF THE PROGRAM UTILIZES THE FOLLOWING FLAGS -

R1062 ACTIVE VEHICLE FLAG - DESIGNATES THE VEHICLE WHICH IS
R1063 DOING RENDEZVOUS THRUSTING MANEUVERS TO THE PROGRAM WHICH
R1064 CALCULATES THE MANEUVER PARAMETERS. SET AT THE START OF
R1065 EACH RENDEZVOUS PRE-THRUSTING PROGRAM.

R1066 FINAL FLAG - SELECTS FINAL PROGRAM DISPLAYS AFTER CREW HAS
R1067 COMPLETED THE FINAL MANEUVER COMPLETION AND DISPLAY
R1068 CYCLE.

R1069 EXTERNAL DELTA V STEERING FLAG - DESIGNATES THE TYPE OF
R1070 STEERING REQUIRED FOR EXECUTION OF THIS MANEUVER BY THE
R1071 THRUSTING PROGRAM SELECTED AFTER COMPLETION OF THIS
R1072 PROGRAM.

R1073 (7) IT IS NORMALLY REQUIRED THAT THE ISS BE ON FOR 1 HOUR PRIOR TO
R1074 A THRUSTING MANEUVER.

R1075 (8) THIS PROGRAM IS SELECTED BY THE ASTRONAUT BY DSKY ENTRY -

R1076 P33 IF THIS VEHICLE IS ACTIVE VEHICLE.

R1077 P73 IF THIS VEHICLE IS PASSIVE VEHICLE.

R1110 INPUT

R1111 (1) TTPIG TIME OF THE TPI MANEUVER - SAVED FROM P32/P72

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R1112 (2) ELEV DESIRED LCS ANGLE AT TPI - SAVED FROM P72/P77
 R1113 (3) TCDH TIME OF THE CDF MANEUVER

R1130 OUTPUT

R1131 (1) TRKMKCAT NUMBER OF MARKS
 R1132 (2) TIGD TIME TO GO
 R1133 (3) +MCA MIDDLE CIRCULAR ANGLE
 R1134 (4) DIFFALT DELTA ALTITUDE AT CDF
 R1135 (5) T2TOT3 DELTA TIME FROM CDF TO COMPLETED TPI
 R1136 (6) NCMTPI DELTA TIME FROM NOMINAL TPI TO COMPLETED TPI
 R1137 (7) DELVLVC DELTA VELOCITY AT CDF - LOCAL VERTICAL COORDINATES

R1139 FCWALINK

R11391 (1) TCDH TIME OF THE CDF MANEUVER
 R11392 (2) TPI TIME OF THE TPI MANEUVER
 R11393 (3) TIG TIME OF THE CDF MANEUVER
 R11394 (4) DELVSET2 DELTA VELOCITY AT CDF - REFERENCE COORDINATES
 R11395 (5) DIFFALT DELTA ALTITUDE AT CDF
 R11396 (6) ELEV DESIRED LCS ANGLE AT TPI

R11402 COMMUNICATION TO THRUSTING PROGRAMS

R11403 (1) TIG TIME OF THE CDF MANEUVER
 R11404 (2) RTIC POSITION OF ACTIVE VEHICLE AT CDF - BEFORE ROTATION
 R11405 INTO PLANE OF PASSIVE VEHICLE
 R11406 (3) VTIC VELOCITY OF ACTIVE VEHICLE AT CDF - BEFORE ROTATION
 R11407 INTO PLANE OF PASSIVE VEHICLE
 R11408 (4) DELVSIN DELTA VELOCITY AT CDF - REFERENCE COORDINATES
 R11409 (5) DELVSAB MAGNITUDE OF DELTA VELOCITY AT CDF
 R1141 (6) XDELVFIG SET TO INDICATE EXTERNAL DELTA V VC COMPUTATION

R1150 SUPPCLTINES USED

R1151 AVFLAGA
 R1152 AVFIACP
 R11525 P2CFLECA
 R1153 VNPDCH
 R1154 SELECTMU
 R1155 ADVANCE
 R1156 CDFMVR
 R1157 INTINT3P
 R1158 ACTIVE
 R1159 PASSIVE
 R1160 S33/34.1
 R1161 ALARM
 R1162 PANKCALI
 R1163 GCFLASH
 R1164 COTOPDCH
 R1166 S32/33.1

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R1167		VN1645									
1499	REF	1							COUNT*	\$/P3273	
1500	REF	2	LAST	624	35,2223	0	2354	1	P33	TC	AVFLAGA
1502	REF	1			35,2224	0	2226	0		TC	P33/P73A
1503	REF	2	LAST	624	35,2225	0	2361	1	P73	TC	AVFLAGP
1505	REF	2	LAST	624	35,2226	0	2366	0	P33/P73A	TC	P20FLCEN
15051	REF	1			35,2227	2	2416	0		CAF	VC6N13
1506	REF	7	LAST	626	35,2230	0	3621	1		TC	VNPOOH
1507	REF	67	LAST	626	35,2231	0	6042	1		TC	INTPRET
1508					35,2232		77745	1			DLOAD
15081	REF	2	LAST	626	35,2233	0	3640	0			TTFIO
15082	REF	6	LAST	626	35,2234		17636	1		STCOL	TTFI
1509	REF	4	LAST	306	35,2235		91777	1			TCOH
1510	REF	11	LAST	625	35,2236		37442	1		STCALL	TIG
1511	REF	2	LAST	625	35,2237	20000	0				SELECTML
1512					35,2240		77624	1	P33/P73B	CALL	
1513	REF	2	LAST	625	35,2241		71016	0			ADVANCE
1514					35,2242		77624	1		CALL	
1515	REF	1			35,2243		71133	0			CCFMVR
1516					35,2244		77201	1		SETPD	VLCAD
1517					35,2245	00001	0				OD
1518	REF	3	LAST	625	35,2246	03544	1				VACT3
1519					35,2247		45115	0		PDVL	CALL
1520	REF	3	LAST	626	35,2250	02311	0				RACT2
1521	REF	1			35,2251		71071	1			INTINT3P
1522					35,2252		77624	1		CALL	
1523	REF	1			35,2253	46425	0				ACTIVE
1524					35,2254		77201	1		SETPD	VLCAD
1525					35,2255	00001	0				OD
1526	REF	2	LAST	142	35,2256	03530	1				VPASS2
1527					35,2257		45115	0		PDVL	CALL
1528	REF	2	LAST	142	35,2260	03522	1				RPASS2
1529	REF	2	LAST	625	35,2261		71071	1			INTINT3P
1530					35,2262		77624	1		CALL	
1531	REF	2	LAST	625	35,2263	46435	1				PASSIVE
1532					35,2264		43145	0		DLCAD	SET
1533	REF	3	LAST	624	35,2265	32425	0				P30ZFPO
1534	REF	1			35,2266	03460	0				ITSWICH
1535	REF	1			35,2267	36317	1			STCALL	NCMTFI
1536	REF	1			35,2270		72674	1			S33/34.1
1537					35,2271		77454	1		BZF	EXIT
1538	REF	1			35,2272		72357	0			P33/P73C
1539	REF	27	LAST	596	35,2273	0	5567	0		TC	ALARM
1540					35,2274	00611	1			CCT	611
1541	REF	2	LAST	624	35,2275	3	5026	1		CAF	VCENCS
1542	REF	166	LAST	625	35,2276	0	4616	1		TC	BANKCALL
1543	REF	10	LAST	625	35,2277		20477	1		CADR	GCFLASH
1544	REF	8	LAST	625	35,2278	0	6701	0		TC	GETOPOOH
1545					35,2281	0	2303	0		TC	+2

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1546	REF	2	LAST	630	35,2342	0 2226 0	TC	P33/P73A
1547	REF	66	LAST	630	35,2342	0 4442 1	TC	INTERFT
1548					35,2344	77745 1	DLOAD	
1549	REF	4	LAST	630	35,2345	32425 0		P33/P73B
1550	REF	2	LAST	630	35,2346	12317 0	STORE	NCMTFI
1551					35,2347	43014 0	P33/P73C BCN	SET
1552	REF	2	LAST	626	35,2340	11311 0		FINALFLG
1553	REF	1			35,2341	72312 0		P33/P73D
1554	REF	7	LAST	626	35,2342	00477 1		UPDATEFLG
1557					35,2343	43345 1	P33/P73D CLCAC	DAD
1558	REF	3	LAST	621	35,2344	02317 0		NCMTFI
1559	REF	7	LAST	630	35,2345	03636 1		TTPI
1560	REF	8	LAST	621	35,2346	03636 1	STORE	TTPI
1561					35,2347	77625 1	DSL	
1562	REF	5	LAST	630	35,2340	01777 1		TCCH
1563					35,2341	51025 1	P33/P73E DSU	RFL
1564	REF	3	LAST	626	35,2342	32427 1		60MIN
1565	REF	1			35,2343	72321 1		P33/P73E
1566					35,2344	77615 1	DAD	
1567	REF	4	LAST	631	35,2345	32427 1		60MIN
1568	REF	5	LAST	626	35,2346	16253 1	STCCL	T1TCT2
1569	REF	9	LAST	631	35,2347	03636 1		TTPI
1570					35,2348	41425 1	DSU	PUSH
1571	REF	3	LAST	630	35,2349	03640 0		TTPI
1572					35,2350	45246 0	P33/P73F ABS	DSL
1573	REF	5	LAST	621	35,2351	32427 1		60MIN
1574					35,2352	43244 1	BPL	DAD
1575	REF	1			35,2353	72332 0		P33/P73F
1576	REF	6	LAST	631	35,2354	32427 1		60MIN
1577					35,2355	45565 0	SIGN	STADR
1578	REF	4	LAST	626	35,2356	75522 0	STORE	T2TCT3
1579					35,2357	77776 1	EXIT	
1580	REF	2	LAST	626	35,2358	3 2417 1	CAF	VC6N75
1581	REF	8	LAST	630	35,2359	0 3621 1	TC	VNPPCH
1582	REF	69	LAST	631	35,2360	0 6042 1	TC	INTERFT
1583					35,2361	45175 0	VLOAD	CALL
1584	REF	4	LAST	626	35,2362	02275 0		DELVEFT2
1585	REF	2	LAST	626	35,2363	71107 1		S32/33.1
1586	REF	5	LAST	631	35,2364	36275 1	STCALL	DELVEFT2
1587	REF	3	LAST	626	35,2365	73515 1		VN1645
1588					35,2366	77650 1	COTG	
1589	REF	1			35,2367	72240 1		P33/P73E

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P3800 AVFLAG/P

R3850 SUBROUTINES USED

R3851 UPFLAG
R3852 DOWNFLAG

3900				35,2354	0 0006 1	AVFLAG	EXTEND		AVFLAG = LEN
3901	REF	2	LAST	624	35,2355	23'470 0	QXCH	SUBEXIT	
3902	REF	28	LAST	617	35,2356	0 5504 0	TC	UPFLAG	
3903	REF	1			35,2357	00050 1	ADRES	AVFLAG	
3904	REF	3	LAST	632	35,2361	0 1470 0	TC	SUBEXIT	
3905				35,2361	0 0006 1	AVFLAG	EXTEND		AVFLAG = CSM
3906	REF	4	LAST	632	35,2362	23'470 0	QXCH	SUBEXIT	
3907	REF	64	LAST	617	35,2363	0 5516 0	TC	DOWNFLAG	
3908	REF	2	LAST	632	35,2364	00050 1	ADRES	AVFLAG	
3909	REF	5	LAST	632	35,2365	0 1470 0	TC	SUBEXIT	
39091				35,2366	0 0006 1	P20FLAG	EXTEND		
39092	REF	6	LAST	632	35,2367	23'470 0	QXCH	SUBEXIT	
39093	REF	39	LAST	632	35,2370	0 5514 0	TC	UPFLAG	
3911	REF	8	LAST	631	35,2371	00027 1	ADRES	UPDATEFLG	SET UPDATEFLG
39101	REF	41	LAST	632	35,2372	0 5504 0	TC	UPFLAG	
39102	REF	5	LAST	617	35,2373	00031 0	ADRES	TRACKFLG	SET TRACKFLG
3911	REF	7	LAST	632	35,2374	0 1470 0	TC	SUBEXIT	

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P4600 DISOVLVC

R4650 SUBROUTINES USED

R4651 S32/P3.X

R4652 VNPOOF

4700	REF	11	LAST	318	35,2375	03434	1	DISOVLVC	STORE	DELVLVC
4701					35,2376	45020	1		STG	CALL
4702	REF	2	LAST	141	35,2377	03463	0			NCRME X
47021	REF	1			35,2400	71120	1			S32/P3.X
47022					35,2401	64275	1		VLEAD	MXV
47023	REF	12	LAST	633	35,2402	03434	1			DELVLVC
47024					35,2403	00001	0			IF
470241					35,2404	66172	0		VSL1	SXA,1
470243	REF	1			35,2405	03615	0			VERBNCUN
47025	REF	13	LAST	632	35,2406	03434	1		STORE	DELVLVC
47026					35,2407	77776	1		EXIT	
4703	REF	2	LAST	622	35,2410	31615	1		CA	VERBNCUN
4704	REF	9	LAST	631	35,2411	3621	1		IC	VNPOOF
4705	REF	70	LAST	631	35,2412	06042	1		IC	INTERPRET
4706					35,2413	77650	1		ECTC	
4707	REF	3	LAST	632	35,2414	3462	1			NCRME X

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P4800 CONSTANTS

4901	35,2415	01413 0	V06N11	VM	0611	
4902	35,2416	01415 0	V06N13	VM	0613	
4903	35,2417	01513 1	V06N75	VM	0675	
4914	35,2420	77776 1	SN359+	2DEC	- .000086601	
4914	35,2421	62460 1				
4915	35,2422	17777 0	CS359+	2DEC	+ .499999992	
4915	35,2423	37776 0				
4916	35,2424	00000 1	P30ZERO	2DEC	0	
4916	35,2425	00000 1				
4917	35,2426	00025 0	6CMIN	2DEC	360000	
4917	35,2427	37100 1				
4918	35,2430	00600 1	ALARM/TE	CCT	00600	NO 1
4920	35,2431	00601 0		CCT	00601	2
4921	35,2432	00602 0		CCT	00602	3
4922	35,2433	00603 1		CCT	00603	4
4923	35,2434	00604 0		CCT	00604	5
4924	35,2435	00605 1		CCT	00605	6
4925	35,2436	00606 1		CCT	00606	7

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P5000 CSI/A

R5150 SUBROUTINES USED

R5152 VECSHIFT
 R5153 TIMELEFT
 R5154 PERIAPC
 R5155 SHIFTR1
 R5156 INTINT2C
 R5157 CDHMPV
 R5158 PERIAP01
 R5159 INTINT
 R5160 ACTIVE

5400			34,2057		BANK	34	
5401	REF	1	34,2060		SETLOC	CSI/CDH1	
5402			34,2057		BANK		
5403	REF	8	57,1470		EBANK=	SUBEX1T	
5404	REF	1			COUNT*	17/CSI	
5413			34,2057	00000	1	LCOPMX	
5413			34,2060	00000	0		
5414			34,2061	00003	1	INITST	2DEC .03048 E-7
5414			34,2062	34661	1		INITIAL DFLDV = 10 FPS
5415			34,2063	00006	1	DVMAX1	2DEC 3.6480 E-7
5415			34,2064	04467	0		MAXIMUM CV1 = 1000 FPS
5416			34,2065	00601	0	DVMAX2	2DEC 3.14472 E-7
5416			34,2066	33216	1		989 FPS
5417			34,2067	10000	0	ICPP2	2DEC 1.00E-2
5417			34,2070	00000	1		
5418			34,2071	00000	1	ICPB2E	2DEC 1
5418			34,2072	00001	0		
5419			34,2073	00004	0	PMINE	2DEC 157420 E-29
5419			34,2074	31556	0		85 NM - MUST BE 8 WORDS BEFORE PMINE
5420			34,2075	00000	1	EPSILN1	2DEC .0003448 E-7
5420			34,2076	01177	1		.1 FPS
5421			34,2077	00002	0	NICKELC	2DEC .021336 E-7
5421			34,2100	27311	1		7 FPS (CHANGED FROM .05 FPS)
5422			34,2101	77754	1	FIFPSEP	2DEC -.152400 E-7
5422			34,2102	57611	0		50 FPS
5423			34,2103	00000	0	PMINM	2DEC 10668 E-29
5423			34,2104	12326	0		35000 FT - MUST BE 8 WORDS AFTER PMINE
5424			34,2105	00116	1	DFLMAX1	2DEC .6096000 E-7
5424			34,2106	00730	0		200 FPS
5425			34,2107	00000	1	CNETTET	2DEC .0001 E-3
5425			34,2110	06432	0		
5426			34,2111	00003	1	TMIN	2DEC 60000
5426			34,2112	25140	0		10 MIN
5510			34,2113	42014	0	CSI/A	CLEAR SFT
5501	REF	1	34,2114	13250	0		INITIALIZE INDICATORS
5502	REF	1	34,2115	02061	0		S32.1F1
							CVTI HAS EXCEEDED MAX INDICATOR
							S32.1F2
							FIRST PASS FOR NEWTON ITERATION INDICATOR

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5503				34,2116	43214 C	CLEAP	SET		
5504	REF	1		34,2117	03262 1		S32.1F3A	00=1ST 2 PASSES 2ND CYCLE 01=FIRST CYCLE	
5505	REF	1		34,2120	03063 1		S32.1F3B	10=2ND CYCLE 11=50FPS STAGE 2ND CYCLE	
5506				34,2121	77745 1	CLCAD			
5507	REF	5	LAST	621	34,2122	32425 C	P3/ZEFC		
5508	REF	1		34,2123	03606 1	STORE	LCOPCT		
5509	REF	4	LAST	624	34,2124	03514 1	STORE	CS1ALRM	
5510				34,2125	77201 1	SETPD	VLCAD		
5511				34,2126	00001 0		00		
5512	REF	3	LAST	626	34,2127	02203 C	RACT1		
5513				34,2130	41446 1	ABVAL	PUSH	RA1	B29 FLO2C
5514				34,2131	70501 1	NCRM	SF1		
5515	REF	2	LAST	489	34,2132	00050 1	X2		B29-N2+ B1 FLO4C
5516				34,2133	51515 1	PCVL	ABVAL		
5517	REF	1		34,2134	03552 0		RFASS3		
5518				34,2135	55201 0	NCRM	BCDV	RA1/REF3	B1 FLO2C
5519	REF	5	LAST	590	34,2136	00047 1	X1		
5520				34,2137	52464 0	XSL,2	SR*		B2
5521	REF	6	LAST	636	34,2140	00046 0	X1		
5522				34,2141	57175 0		1,2		
5523				34,2142	41215 1	CAC	DNF	(1+(RA1/REF3))RA1	B29+B2=B31 FLO0C
5524	REF	1		34,2143	30070 0		10PR2		
5525				34,2144	65301 0	NCRM	FCOL		PL02D
5526	REF	7	LAST	636	34,2145	00047 1	X1		
5527	REF	1		34,2146	02321 0		PTMU		
5528				34,2147	56342 1	SR1	DCV		P38-B31= B7 FLO0C
5529				34,2150	75457 0	SL*	SCRT		B7
5530				34,2151	20172 1		0 -7,1		
5531				34,2152	52515 0	PCVL	UNIT		PL02C
5532	REF	4	LAST	636	34,2153	02303 0	RACT1		
5533				34,2154	47315 0	PCVL	VXV		
5534	REF	2	LAST	118	34,2155	02261 0	LP1		
5535				34,2156	77656 1	UNIT		UNIT(LRP1 X UVP1 X UP41) = LH1	
5536				34,2157	72441 0	EFT	SL1	VAL . UF1	B7
5537	REF	2	LAST	145	34,2160	03472 0	VACT1		
5538				34,2161	45421 1	BCSU	STADR		FLOCC
5539	REF	3	LAST	142	34,2162	60203 0	STOCL	DELVCS1	
5540	REF	1		34,2163	30062 0		INITST	10 FPS	
5541	REF	4	LAST	142	34,2164	03612 1	STORE	DFLOV	
5542				34,2165	42245 1	CS1/P1	CLCAD	IF L00FCT = 16	
5543	REF	2	LAST	636	34,2166	03606 1	LCOPCT		
5544	REF	1		34,2167	30072 1		1CFB28		
5545	REF	3	LAST	636	34,2170	02606 1	STORE	LCOPCT	
5546				34,2171	77225 0	CSU	AXT,2		
5547	REF	1		34,2172	30060 1		LCOPMX		
5548				34,2173	00006 1		6		
5549				34,2174	77644 1	BFL			
5550	REF	1		34,2175	70776 0		SCNDSCL		
5551				34,2176	77501 0	CS1/B2	SETPD		
5552				34,2177	60001 0		00		

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560003	REF	1		34,2262	70372 0		CIPCL	
560004				34,2263	77745 1	ELCAD		
560005	REF	2	LAST 126	34,2264	02752 0		ECC	
5601				34,2265	50025 0	DSU	BMN	
5602	REF	1		34,2266	30110 1		CNETHH	
5603	REF	2	LAST 638	34,2267	70372 0		CIRCL	
5604				34,2270	45145 0	ELCAD	CALL	
5605	REF	1		34,2271	00041 1		R1	
5606	REF	4	LAST 637	34,2272	46451 0		SHIFTR1	
5607				34,2273	60201 1	SETPC	NCRM	
5608				34,2274	00002 1		2D	
5609	REF	8	LAST 636	34,2275	00047 1		X1	
5610				34,2276	50315 0	FDVL	DCT	FL040
5611	REF	6	LAST 637	34,2277	02303 0		PACT1	
5612	REF	3	LAST 637	34,2300	03566 1		VACT4	
5613				34,2301	56246 1	ABS	DOV	
5614				34,2302	00003 1		02D	(/ROCTV)/R1 E36-B29= P7
5615				34,2303	45257 0	SL*	DSU	
5616				34,2304	20201 0		0,1	
5617	REF	1		34,2305	30100 0		NICKFLDP	
5618				34,2306	71240 1	BMN	ELCAD	
5619	REF	5	LAST 638	34,2307	70372 0		CIRCL	
5620	REF	2	LAST 126	34,2310	02740 0		F	
5621				34,2311	45312 0	SL2	DSU	
5622	REF	2	LAST 636	34,2312	30070 0		ICPR2	
5623				34,2313	14017 1	STOCL	14D	
5624	REF	3	LAST 118	34,2314	02217 0		R7SP1/ML	
5625				34,2315	56342 1	SF1	DDV	(1/ROCTML)/R1 B-16-B29 = B-45 FL02C
5626				34,2316	41325 0	FDCL	DMF	
5627	REF	3	LAST 638	34,2317	02740 0		P	
5628	REF	2	LAST 638	34,2320	00041 1		R1	
5629				34,2321	77624 1	CALL		
5630	REF	5	LAST 638	34,2322	46451 0		SHIFTR1	
5631				34,2323	72412 0	SL4	SL1	
5632				34,2324	41366 1	SORT	DMF	((F/ML)**.5)/F1 E14+E-45 = E-31 FL02C
5633				34,2325	52414 1	BOFF	SL3	
5634	REF	2	LAST 27	34,2326	04342 1		CNCCFLG	
5635	REF	1		34,2327	70330 0	CSI/B3	OST/B3	
5636				34,2330	50315 0	PDVL	DCT	
5637	REF	7	LAST 638	34,2331	02202 0		PACT1	
5638	REF	4	LAST 638	34,2332	03566 1		VACT4	
5639	REF	2	LAST 143	34,2333	03617 1	STOPE	RECTV	
5640				34,2334	77646 0	ABS		
5641				34,2335	41301 0	NORM	DMF	((P/ML)**.5)ROCTV/F1 FL02C
5642	REF	3	LAST 636	34,2336	00050 1		X2	
5643				34,2337	53660 1	XSU,1	SL*	E-31+E36-B3= E2
5644	REF	4	LAST 638	34,2340	70047 1		X2	
5645				34,2341	20204 0		3,1	
5646				34,2342	14015 0	STOPL	12D	
5647	REF	6	LAST 636	34,2343	32+25 0		P3,2FPO	

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5648					34,2344	00021 1	STORE	16D	
5649					34,2345	52575 0	VLCAD	UNIT	
5650					34,2346	00015 0		12D	
5651	REF	4	LAST	637	34,2347	26737 1	STCVL	SATH	ALSO STORES CETH AND 0
5652	REF	8	LAST	638	34,2350	02203 0		RACT1	
5653					34,2351	75315 1	PDVL	SIGN	
5654	REF	5	LAST	638	34,2352	03566 1		VACT4	
5655	REF	3	LAST	638	34,2353	02617 1		RDCTV	
5656					34,2354	45076 1	VCOMP	CALL	
5657	REF	2	LAST	637	34,2355	46441 1		VFCSHIFT	
5658	REF	5	LAST	637	34,2356	26744 1	STCVL	VVFC	
5659					34,2357	77614 1	SET		
5660	REF	4	LAST	637	34,2360	02466 0		RVSX	
5661	REF	4	LAST	637	34,2361	36655 1	STCALL	RVFC	
5662	REF	3	LAST	637	34,2362	24732 1		TIMETEST	
5663					34,2363	51125 0	FDDL	RFL	
5664	REF	4	LAST	639	34,2364	03617 1		RDCTV	
5665	REF	1			34,2365	72276 1		NTP/2	
5666					34,2366	45345 1	DLCAD	DSL	
5667	REF	2	LAST	637	34,2367	03674 0		HAFPA1	
5668					34,2370	52006 0	FLSH	GCTC	
5669	REF	2	LAST	639	34,2371	75376 1		NTP/2	
5670					34,2372	71201 1	CIPCL	SETPD	
5671					34,2373	00001 0		DLCAD	
5672	REF	7	LAST	638	34,2374	32425 0		00D	
5673					34,2375	77616 1		P00ZERO	
5674					34,2376	41345 0	NTP/2	PUSH	
5675	REF	4	LAST	624	34,2377	03467 1		DLCAD	DMP
5676	REF	3	LAST	635	34,2400	02604 0			NA
5677					34,2401	45261 0		HAFPA1	
5678					34,2402	22217 1	SL	DSU	
5679					34,2403	77615 0		14D	
5680	REF	10	LAST	625	34,2404	02634 0	FAC		
5681	REF	6	LAST	631	34,2405	01777 1	STORE	TCDH	
5682					34,2406	77021 1	BDSL	AXT,2	
5683	REF	11	LAST	631	34,2407	03636 1		TTP1	
5684					34,2410	00005 1		SD	
5685					34,2411	40240 0	BMN	SETPD	
5686	REF	4	LAST	637	34,2412	71776 0		SCNDSCL	
5687					34,2413	00001 0		OD	
5688					34,2414	63375 0	VLOAC	PDVL	
5689	REF	6	LAST	635	34,2415	03566 1		VACT4	
5690	REF	9	LAST	635	34,2416	02273 0		RACT1	
5691					34,2417	77624 1	CALL		
5692	REF	1			34,2420	71062 0		INTINT2C	
5693	REF	4	LAST	630	34,2421	26211 0	STCVL	RACT2	
5694	REF	7	LAST	620	34,2422	00007 0		VATT	
5695	REF	1			34,2423	27514 1	STCVL	VACT2	
5696	REF	4	LAST	625	34,2424	03506 1		VPASC1	
5697					34,2425	63211 1	SETPD	PDVL	

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5698					34,242A	00001 0		CD		
5699	PFF	2	LAST	625	34,2427	02511 1		RFASS1		
5700					34,2431	77624 1	CALL			
5701	REF	2	LAST	639	34,2431	71162 0		INTINT2C		
5702	REF	3	LAST	630	34,2432	27522 1	STCVL	RFASS2		
5703	REF	8	LAST	639	34,2433	00007 0		VATT		
5704	REF	2	LAST	630	34,2434	37530 0	STCALL	VFASS2		
5705	REF	2	LAST	630	34,2435	71133 0		CDHMVP		
5706					34,2436	40275 1	VLCAD	SETPD		
5707	REF	5	LAST	639	34,2437	02311 0		FACT2		
5708					34,2441	00001 0		OD		
5709					34,2441	45115 0	PDVL	CALL		
5710	REF	4	LAST	630	34,2442	03544 1		VACT3		
5711	REF	2	LAST	620	34,2443	46341 1		PEPIAFCL		
5712					34,2444	77624 1	CALL			
5713	REF	6	LAST	638	34,2445	46451 0		SHIFTF1		
5714	REF	2	LAST	142	34,2446	27674 0	STOVL	PCSTCDH		
5715	REF	5	LAST	640	34,2447	03544 1		VACT3		
5716					34,2450	63201 1	SETPD	PDVL		
5717					34,2451	00001 0		OD		
5718	REF	6	LAST	640	34,2452	02311 0		FACT2		
5719					34,2453	65325 0	PDDL	PDDL		
5720	REF	7	LAST	639	34,2454	01777 1		TCDH		
5721	REF	11	LAST	639	34,2455	02636 1		TIPI		
5722					34,2456	41525 1	PDDL	PUSH		
5723	PFF	2	LAST	625	34,2457	33641 1		TWCP1		
5724					34,2460	77624 1	CALL			
5725	REF	2	LAST	625	34,2461	73376 1		INTINT		
5726					34,2462	77624 1	CALL			
5727	REF	2	LAST	630	34,2463	46425 0		ACTIVE		
5728					34,2464	77745 1	CLCAD			
5729	PFF	4	LAST	316	34,2465	02257 0		ELFV		
5730					34,2466	73411 0	SETPD	SINF		
5740					34,2467	00007 0		6D		
5741					34,2470	53515 0	PDVL	UNIT		
5742	REF	2	LAST	625	34,2471	73536 1		FACT3		
5743					34,2472	00011 0	STORE	000	URA3 AT 000	
5744					34,2473	47315 1	PDVL	VXV	FL14C, FL08C	
5745	REF	4	LAST	637	34,2474	02261 0		UPL		
5746					34,2475	77656 1	UNIT			
5747					34,2476	71525 0	PDDL	CCSINE	UNIT(URA3XUVA3XURA3) = LH3	B1 FL14C
5748	REF	5	LAST	640	34,2477	02257 0		FLFV		
5749					34,2500	45561 1	VXSC	STADR	(CCSICS)(UF3)	B2 PLOED
5750					34,2501	77754 1	STORE	180	PLLS	
5751					34,2502	74345 0	CLCAD	VXSC	(SINLCS)(URA3) = U	B2 PLOED
5752					34,2503	76455 1	VAD	VSL1		
5753					34,2504	00023 0		180		B1
5754					34,2505	50206 0	FLSH	DET		PLOED
5755	REF	3	LAST	640	34,2506	03536 1		FACT3	(U . RA3) = TEMP1	B1 +B29=B30
5756					34,2507	41552 0	SL1	PUSH		B29 PLOED

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5757				34,251	72216 0	DSQ	TLCAD	TEMP1**2	E58
5758	PFF	285	LAST	624	34,2511	00155 0	MPAC		
5759				34,2512	50315 0	PDVL	DCT		PL110
5760	PFF	4	LAST	640	34,2513	03536 1	RACT2		
5761	PFF	5	LAST	641	34,2514	03536 1	RACT3		
5762				34,2515	57551 1	TLCAD	DCCMP	FA3.RA3	
5763	PFF	286	LAST	641	34,2516	00155 0	MPAC		
5764				34,2517	50315 0	PDVL	DCT	RF3.RF3	B58 PL140
5765	PFF	2	LAST	636	34,2520	03552 0	RFASS2		
5766	PFF	2	LAST	641	34,2521	03552 0	RFASS3		PL11C
5767				34,2522	76371 0	TAD	TAD	TEMP1**2+RA2.FA3+RF3.RF3=TEMP2	PLC6C
5768				34,2523	71244 0	BPL	DLOAD		
5769	PFF	1		34,2524	70542 0		K1CPK2		
5770	PFF	4	LAST	636	34,2525	03606 1	LCPCT		
5771				34,2526	77025 0	CSU	AXT,2		
5772	PFF	2	LAST	636	34,2527	30072 1	ICFB28		
5773				34,2530	00001 0		ID		
5774				34,2531	77654 0	BZF			
5775	PFF	1		34,2532	72043 0		ALMXTA		
5776				34,2533	70545 1	DLOAD	SR1		
5777	PFF	5	LAST	636	34,2534	03612 1	DELCV		
5778	PFF	6	LAST	641	34,2535	03612 1	STORE	DELDV	
5779				34,2536	77621 1	BDSU			
5780	PFF	1		34,2537	02576 0		DVPREV		
5781	PFF	8	LAST	637	34,2540	37574 0	STCALL	DELVCSE	
5782	PFF	1		34,2541	77165 1		CSI/B1		
5783				34,2542	41566 1	K1CPK2	SQRT	TEMP3 = TEMP2**5	B25 PL100
5784				34,2543	45276 0	DCCMP	DSU		
5785				34,2544	00017 0		060	-TEMP1-TEMP3 = K2 AT 100	
5786				34,2545	14012 0	STODL	100		PLC6C
5787				34,2546	45425 0	CSU	STADR		FL06C
5788				34,2547	77762 1	STORE	120	-TEMP1+TEMP2 = K1 AT 120	
5789				34,2550	77646 0	ABS			
5790				34,2551	14017 1	STODL	140		
5791				34,2552	00013 0		170		
5792				34,2553	45246 0	ABS	DSU		
5793				34,2554	00017 1		140		
5794				34,2555	71240 1	BMA	DLOAD		
5795	PFF	1		34,2556	77561 1		K2.		
5796				34,2557	00015 0		120		
5797				34,2560	00013 0	STORE	100	K=K1	
5798				34,2561	77745 1	DLOAD			
5799				34,2562	00013 0		100		
5800				34,2563	76561 1	VXSC	VSL1		
5801				34,2564	53455 0	VAC	UNIT	V=FA3+K0 UNIT	B1
5802	PFF	6	LAST	641	34,2565	03536 1	RACT3		
5803				34,2566	53515 0	PDVL	UNIT		FL06C
5804	PFF	4	LAST	641	34,2567	03552 0	RFASS3		
5805				34,2570	53515 0	PDVL	UNIT		PL120
5806	PFF	1		34,2571	03561 1		VPASS3		

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5807					34,2572	62235 0	VXV	PDVL	LVP3 X URP3	PL18C
5808					34,2573	00007 0		06D		
5809					34,2574	00007 0		06D		
5810					34,2575	50235 0	VXV	DCT		
5811					34,2576	00001 0		00C		
5812					34,2577	77626 0	STADR			PL12D
5813					34,2600	53762 1	STOVL	12D	(LVP3XV).(LVP3XURP3)=TEMP	PL06C
5814					34,2601	72441 0	DCT	SL1		PL00C
5815					34,2602	75326 1	APCCCS	SIGN		
5816					34,2603	00015 0		12D		R0
5817					34,2604	41542 1	SP1	PLSH	GAMMA=SIGN(TEMP)ARCOS(LNITV.URP3)	PL02C
5818					34,2605	71214 0	BON	DLOAD		
5819	REF	2	LAST	635	34,2606	03301 0		S32.1F2		
5820	REF	1			34,2607	70644 0		FRSTPAS		
5821					34,2610	00001 0		00C	NOT THE FIRST PASS OF A CYCLE	
5822					34,2611	65225 1	CSL	PDDL	GAMMA-CAMPREV	B1 PL04D
5823	REF	2	LAST	143	34,2612	03610 0		GAMPREV		
5824	REF	9	LAST	641	34,2613	03574 1		DELVCSI		
5825					34,2614	60225 1	CSL	NCRM		R7
5826	REF	2	LAST	641	34,2615	03576 0		DVPREV		
5827	REF	5	LAST	638	34,2616	00047 1		X1		
5828					34,2617	65265 0	BDDV	PDDL	(GAM-CAMPREV)/(CV-CVPREV)	B-6+N1 PL06D
5829					34,2620	00003 1		02D	= SLCFE	
5830	REF	10	LAST	642	34,2621	03574 1		DELVCSI		
5831	REF	3	LAST	642	34,2622	03576 0	STORE	DVPREV		
5832					34,2623	43004 0	BOFF	BOFF		
5833	REF	2	LAST	637	34,2624	03342 1		S32.1F3A		
5834	REF	1			34,2625	70656 0		THROCHK		
5835	REF	3	LAST	637	34,2626	03343 0		S32.1F3B		
5836	REF	2	LAST	642	34,2627	70656 0		THROCHK		
5837					34,2630	41345 0	FLCAD	DMP		
5838					34,2631	00003 1		02C		
5839	REF	3	LAST	642	34,2632	03610 0		GAMPREV		
5840					34,2633	71244 0	BPL	DLOAD		
5841	REF	1			34,2634	70663 0		FIFTYFPS		
5842	REF	2	LAST	636	34,2635	31062 0		INITST		
5843					34,2636	77765 0	SIGN			
5844	REF	7	LAST	641	34,2637	03612 1		DELDV		
5845	REF	8	LAST	642	34,2640	03612 1	STORE	DLOAD		
5846					34,2641	43004 0	SFT	CLEAR		
5847	REF	4	LAST	642	34,2642	03562 0		S32.1F3A		
5848	REF	4	LAST	642	34,2643	03263 0		S32.1F3B		
5849					34,2644	77745 1	FRSTPAS	DLOAD		
5850					34,2645	00001 0		00C		
5851	REF	4	LAST	642	34,2646	17610 0	STOCL	GAMPREV		
5852	REF	11	LAST	642	34,2647	03574 1		DELVCSI		
5853	REF	4	LAST	642	34,2650	03576 0	STORE	DVPREV		
5854					34,2651	43005 1	CSU	CLEAR		
5855	REF	9	LAST	642	34,2652	03612 1		DELDV		
5856	REF	3	LAST	642	34,2653	03261 1		S32.1F2		

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5857	REF	12	LAST	642	34,2654	37574 0	STCALL	DELVCSI	
5858	REF	2	LAST	641	34,2655	70165 1		CSI/B1	
5859					34,2656	42014 0	THROCK	ECN	BCN
5860	REF	5	LAST	642	34,2657	73312 0		S32.1F3A	
5861	REF	1			34,2660	70712 0		NEWTN	
5862	REF	5	LAST	642	34,2661	73313 1		S32.1F3B	
5863	REF	2	LAST	643	34,2662	70732 0		NEWTN	
5864					34,2663	75345 1	FIFTYFPS	CLCAD	SIGN
5865	REF	1			34,2664	30112 1		FIFPSDP	
5866					34,2665	70715 1		04D	
5867					34,2666	77765 0	SIGN		
5868	REF	5	LAST	642	34,2667	03610 0		GAMPREV	
5869	REF	10	LAST	642	34,2670	13612 1	STCRF	DELDV	
5870					34,2671	42276 0	CCCMF	04D	
5871	REF	13	LAST	643	34,2672	13574 1		DELVCSI	
5872	REF	14	LAST	643	34,2673	17574 1	STCCL	DELVCSI	
5873					34,2674	00001 0		04D	
5874					34,2675	43014 0	SFT	SFT	
5875	REF	6	LAST	642	34,2676	02063 1		S32.1F3B	
5876	REF	6	LAST	642	34,2677	03062 0		S32.1F3A	
5877	REF	6	LAST	643	34,2700	37610 1	STCALL	GAMPREV	
5878	REF	1			34,2701	70176 0		CSI/B2	
5879					34,2712	60345 0	NEWTN	CLCAD	NCFM
5880					34,2703	01005 1		04D	
5881	REF	5	LAST	638	34,2714	00050 1		X2	
5882					34,2715	54165 0	BDDV	XSD,1	
5883					34,2716	00001 0		04D	
5884	REF	6	LAST	642	34,2717	10047 1		X2	
5885					34,2718	77657 0	SP*		
5886					34,2711	20601 1		0,1	
5887	REF	11	LAST	643	34,2712	17612 1	STCCL	DELDV	
5888					34,2713	00001 0		04D	
5889	REF	7	LAST	643	34,2714	02610 0	STCRF	GAMPREV	
5890					34,2715	51545 1	CLCAD	APS	
5891	REF	12	LAST	642	34,2716	03612 1		DELDV	
5892					34,2717	45206 1	PUSH	DSU	
5893	REF	1			34,2720	30076 0		EPSILN1	
5894					34,2721	71240 1	BMN	CLCAD	
5895	REF	1			34,2722	70737 0		CSI/SOL	
5896					34,2723	50025 0	FSU	BMN	
5897	REF	1			34,2724	20106 0		DELMAX1	
5898	REF	1			34,2725	70732 0		CSISTEP	
5899					34,2726	75345 1	CLCAD	SIGN	
5900	REF	2	LAST	642	34,2727	30116 0		DELMAX1	
5901	REF	12	LAST	643	34,2730	13612 1		DELDV	
5902	REF	14	LAST	642	34,2731	13612 1	STCRF	DELDV	
5903					34,2732	45345 1	CLCAD	DSU	
5904	REF	15	LAST	643	34,2733	73574 1		DELVCSI	
5905	REF	15	LAST	642	34,2734	03612 1		DELDV	
5906	REF	16	LAST	643	34,2735	37574 0	STCALL	DELVCSI	

FLO8C

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P6000 ADVANCE

R6050 SUBROUTINES USED

R6051 PREFSET
R6052 RETATE

6100					34,3016	71220 1	ADVANCE	STG	PLCAP
6101	RFF	9	LAST	635	34,3017	03472 1			SUBEXIT
6102	RFF	12	LAST	630	34,3020	03442 0			TIG
6103	RFF	22	LAST	625	34,3021	34041 0		STCALL	TDEC1
6104	RFF	2	LAST	625	34,3022	46403 1			PREFSET
6105					34,3023	77214 0		SFT	VECAP
6105 ^e	RFF	2	LAST	617	34,3024	01067 1			XDFLVFLG
6106	RFF	2	LAST	641	34,3025	03560 1			VPASS3
6107	RFF	4	LAST	640	34,3026	03530 1		STORE	VPASS2
6108	RFF	5	LAST	639	34,3027	27506 1		STCVL	VPASS1
6109	RFF	5	LAST	641	34,3030	03552 0			RPASS3
6110	RFF	4	LAST	640	34,3031	03522 1		STORE	RPASS2
6111	RFF	4	LAST	640	34,3032	03510 1		STORE	RPASS1
6112					34,3033	47256 0		UNIT	VXV
6113	RFF	6	LAST	645	34,3034	03506 1			VPASS1
6114					34,3035	77656 1		UNIT	
6115	RFF	5	LAST	640	34,3036	26261 0		STCVL	UP1
6116	RFF	7	LAST	641	34,3037	03536 1			RACT3
6117	RFF	5	LAST	620	34,3040	37642 0		STCALL	RTIG
6118	RFF	1			34,3041	71052 0			RETATE
6119	RFF	7	LAST	640	34,3042	02311 0		STORE	RACT2
6120	RFF	10	LAST	630	34,3043	26303 0		STCVL	RACT1
6121	RFF	6	LAST	640	34,3044	03544 1			VACT3
6122	RFF	4	LAST	620	34,3045	37650 0		STCALL	VTIG
6123	RFF	2	LAST	645	34,3046	71052 0			RETATE
6124	RFF	2	LAST	639	34,3047	03514 1		STORE	VACT2
6125	RFF	4	LAST	637	34,3050	37472 1		STCALL	VACT1
6126	RFF	10	LAST	645	34,3051	03470 1			SUBEXIT

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P62 C ROTATE
.....

6300					34,2152	414 6 0	ROTATE	PLSH	PLSH
6301					34,3053	74241 0		COT	VXSC
6302	PFF	6	LAST	645	34,2054	02261 0			UP1
6303	PFF	7	LAST	646	34,3155	02261 0			UP1
6304					34,3056	51352 1		VSL2	BVSU
6305					34,3057	63256 0		UNIT	PCVL
6306					34,3160	74246 1		ABVAL	VXSC
6307					34,3061	43572 0		VSL1	FVG

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P7000 INTINTMA

7100					34,3162	65325 0	INTINT2C PDDL	PDDL
7101	REF	12	LAST	644	34,3053	03634 0		TCSI
7102	REF	10	LAST	644	34,3064	01777 1		TCDH
7103					34,3065	41525 0	PDDL	PLSH
7104	REF	2	LAST	640	34,3066	33641 1		TWCFI
7105					34,3067	77650 1	GCTC	
7106	REF	3	LAST	640	34,3070	73376 1		INTINT
7107					34,3071	65325 0	INTINT3P PDDL	PEFL
7108	REF	11	LAST	647	34,3072	01777 1		TCDH
7109	REF	13	LAST	644	34,3073	03636 1		TTPT
7110					34,3074	41525 0	PDDL	PLSH
7111	REF	9	LAST	644	34,3075	32425 0		P2CZERO
7112					34,3076	77650 1	GCTC	
7113	REF	4	LAST	647	34,3077	73376 1		INTINT

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P7400 S32/33.1

R7450 SUBROUTINES USED

R7451 S32/33.X

7500				34,3100	76720 1	S32/33.1 STG	AXI,1
75001	REF	11	LAST	645	34,3101	03470 1	SUFFIXIT
75002				34,3102	01521 0	VA	G681
75003				34,3103	77624 1	CALL	
75004	REF	2	LAST	626	34,3104	72375 0	DISCVLVC
7501				34,3105	77624 1	CALL	
7502	REF	2	LAST	633	34,3106	71121 1	S32/33.X
7503				34,3107	61375 1	VLCAD	VXM
7504	REF	14	LAST	632	34,3110	03434 1	DEIVLVC
7505				34,3111	00001 0		OC
75051				34,3112	77772 0	VSL1	
7506	REF	8	LAST	620	34,3113	03656 1	STORE DELVSIN
7507				34,3114	51406 1	FLSH	AEVAL
7508	REF	3	LAST	620	34,3115	27664 0	STOVL DELVSAB
7509				34,3116	77651 1	GOTO	
7510	REF	12	LAST	648	34,3117	03470 1	SUBEXIT

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P78 S32/33.X

7900					34,3120	77201 1	S32/33.X SFTPD	VLOAD
7901					34,3121	00007 0		6D
7902	REF	8	LAST	646	34,3122	02261 0		UF1
7903					34,3123	63276 1	VCOMP	PDVL
7904	REF	11	LAST	64F	34,3124	02303 0		PACT1
7905					34,3125	57456 1	LNIT	VCOMP
7906					34,3126	47205 0	PUSH	Vxv
7907	REF	9	LAST	649	34,3127	02261 0		UF1
7908					34,3130	77772 0	VSL1	
7909					34,3131	00601 0	STORE	UC
7910					34,3132	77616 0	RVQ	

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P8000 CPMVR

REC50 SUPPLINES USED

R8051 VECSHIFT

R8052 TIMETHET

R8053 SHIFTRI

8100					34,3132	77220 1	CPMVR	STC	VLCAD	
8101	REF	13	LAST	648	34,3134	03470 1			SUREXIT	
8102	REF	8	LAST	645	34,3135	02311 0			RACT2	
8103					34,3136	53406 0		PUSH	UNIT	
8104	REF	1			34,3137	27544 1		STOVL	UNVEC	UP SUB A
8105	REF	5	LAST	645	34,3140	03522 1			RFASS2	
8106					34,3141	50256 0		UNIT	DCT	
8107	REF	2	LAST	650	34,3142	03544 1			UNVEC	
8108					34,3143	72406 0		PUSH	SL1	
8109	REF	3	LAST	496	34,3144	16732 0		STOVL	CSTH	
8110					34,3145	65216 0		CSC	PDDL	
8111	REF	5	LAST	590	34,3146	06514 1			DPL/4TH	
8112					34,3147	45302 1		SP2	DSU	
8113					34,3150	72566 1		SCRT	SL1	
8114					34,3151	57515 1		PDVL	VCCMP	
8115					34,3152	77635 1		VXV		
8116	REF	6	LAST	650	34,3153	03522 1			RFASS2	
8117					34,3154	65241 0		DOT	PDDL	
8118	REF	10	LAST	645	34,3155	02261 0			UFI	
8119					34,3156	45565 0		STGN	STADR	
8120	REF	5	LAST	639	34,3157	51047 0		STOVL	SNTH	
8121	REF	7	LAST	650	34,3160	03522 1			RFASS2	
8122					34,3161	45115 0		PDVL	CALL	
8123	REF	5	LAST	645	34,3162	03530 1			VFASS2	
8124	REF	3	LAST	639	34,3163	46441 1			VECSHIFT	
8125	REF	6	LAST	639	34,3164	26744 1		STOVL	VVEC	
8126					34,3165	77614 1		CLEAR		
8127	REF	5	LAST	639	34,3166	03666 1			RVSX	
8128	REF	5	LAST	639	34,3167	36655 1		STCALL	RVFC	
8129	REF	4	LAST	639	34,3170	24722 1			TIMETHET	
8130					34,3171	53754 1		LXA,2	VSL*	
8131	REF	2	LAST	620	34,3172	02777 1			RTX2	
8132					34,3173	57576 1			Q,2	
8133					34,3174	00023 0		STORE	180	
8134					34,3175	76441 1		DCT	SLIP	
8135	REF	3	LAST	650	34,3176	03544 1			UNVEC	
8136					34,3177	51515 1		PDVL	ABVAL	OD = V SLR PV
8137					34,3200	63257 1		SL*	PDVL	
8138					34,3201	57576 1			Q,2	
8139	REF	9	LAST	650	34,3202	02311 0			RACT2	
8140					34,3203	65246 1		APVAL	PDDL	20 = LENGTH OF R SUB A
8141					34,3204	77625 0		DSU		

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8142				34,3205	00003 1						
8143	REF	4	LAST	317	34,3206	17601 1	STOCL	DIFFALT	DELTA H IN METERS	B+29	
8144	REF	2	LAST	126	34,3207	02742 1		P14			
8145					34,3210	65251 0	NORM	PCDL	2 - P V**/ML		040
8146	REF	10	LAST	642	34,3211	00047 1		X1			
8147	REF	3	LAST	628	34,3212	00041 1		R1			
8148					34,3213	77624 1	CALL				
8149	REF	7	LAST	640	34,3214	46451 0		SHIFTR1			
8150					34,3215	56362 0	SLP	DEV			
8151					34,3216	41457 1	SL*	PLSH			
8152					34,3217	20174 1		0 -5,1			
8153					34,3220	65225 1	DSL	PDDL	A SUE A	B+29	040
8154	REF	5	LAST	651	34,3221	03600 1		DIFFALT			
8155					34,3222	56202 0	SP2	DEV	A SUE F	P+31	
8156					34,3223	00025 1		040		B+2	
8157					34,3224	75406 1	PUSH	SGRT	A SLP P/A SLB A		040
8158					34,3225	41275 1	CMFR	DMP			
8159					34,3226	00017 0		060			
816					34,3227	00001 0		000			
8161					34,3230	65272 0	SL3R	PDDL	V SUB AV METERS/CS	B+7	080
8162					34,3231	00003 1		020	R SLB A MAGNITUDE	B+29	
8163					34,3232	65201 0	NORM	PCDL			
8164	REF	11	LAST	651	34,3233	00047 1		X1			
8165	REF	2	LAST	636	34,3234	02321 0		RTMJ			
8166					34,3235	56342 1	SP1	DEV	2MU E+38		
8167					34,3236	65257 1	SL*	PDDL	2 ML/R SLEAA	B+14	100
8168					34,3237	20174 1		0 -5,1			
8169					34,3240	00005 1		040	ASUPA	E+29	
8170					34,3241	65301 0	NORM	PCDL			
8171	REF	7	LAST	642	34,3242	00050 1		X2			
8172	REF	3	LAST	651	34,3243	02321 0		RTMU			
8173					34,3244	56342 1	SP1	DEV			
8174					34,3245	44257 1	SL*	REFL			
8175					34,3246	57614 1		0 -6,2	2U/R - L/A	B+14 (METERS/CS) SC	
8176					34,3247	63525 0	FDCL	DSG			100
8177					34,3250	00011 1		080			
8178					34,3251	75421 1	PDSU	SGRT			
8179					34,3252	47315 0	PDVL	VXV	SGRT (MU(2/R SLE A-1/A SUP A)-VSUBA2) 100		
8180	REF	11	LAST	651	34,3253	02261 0		UP1			
8181	REF	4	LAST	650	34,3254	03544 1		UNVEC			
8182					34,3255	74256 0	UNIT	VXSC			
8183					34,3256	00013 0		100			
8184					34,3257	74315 0	FDVL	VXSC			
8185	REF	5	LAST	651	34,3260	03544 1		UNVEC			
8186					34,3261	00011 1		080			
8187					34,3262	77455 1	VAC	VSL1			
8188					34,3263	77426 0	STADR				
8189	REF	7	LAST	645	34,3264	74233 0	STCRE	VACT3			
8190					34,3265	77451 0	VSL				
8191	REF	2	LAST	645	34,3266	03514 1		VACT2			

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8199	PTF	F	LAST	631	34,3267	36275 1
8200	REF	14	LAST	650	34,3270	33470 1

STCALL DELVSET2
SUREXIT

DELTA VCCF - REFERENCE COORDINATES

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PR201 COMPTGR
R8202 SLEPOLTIN'S USEDR8203 CLKCTASK
R8204 2PHSCHNG

R215				35,2437	BANK 35
R216	REF	2	LAST	624	SETLCC CSI/CDH
R217				35,2437	BANK
R218	REF	1		57,1465	FBANK= PTEN
R219	REF	1			CCUNT# 13/P3575

R211				35,2437	0 0006 1	COMPTGR	EXTEND
R211	REF	2	LAST	653	35,2440	23 1465 1	EXCF RTN
R212	REF	125	LAST	605	35,2441	3 4755 1	CAF ZERC
R213	REF	2	LAST	149	35,2442	55 1162 1	TS DISPDEX
R214	REF	35	LAST	607	35,2443	3 4752 0	CAF PIT2
R215				35,2444	0 0004 0		INHINT
R216	REF	29	LAST	617	35,2445	0 5203 0	TC WAITLIST
R217	REF	2	LAST	242	57,1455		FRANK= WHCF
R218	REF	2	LAST	243	35,2446	0 2723 0	2CAGR CLKCTASK
R219				35,2447	74067 0		
R219	REF	3	LAST	604	35,2450	0 5327 1	TC 2PHSCHNG
R220				35,2451	40036 0		CCT 40036
R221				35,2452	05024 1		CCT 05024
R222				35,2453	13000 0		CCT 13000
R223	REF	3	LAST	653	35,2454	0 1465 1	TC RTN

*** END OF LEMP30S .105 ***

L GROUND TRACKING DETERMINATION PROGRAM - P21

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R0001 GROUND TRACKING DETERMINATION PROGRAM P21

R0002 PROGRAM DESCRIPTION

R0003 MOD NO - 1

R0004 MOD BY - N.M. NEVILLE

R0005 FUNCTIONAL DESCRIPTION-

R0006

R0007 TO PROVIDE THE ASTRONAUT DETAILS OF THE LM OR CSM GROUND TRACK WITHOUT

R0008 THE NEED FOR GROUND COMMUNICATION (REQUESTED BY DSKY).

R0009 CALLING SEQUENCE -

R0010

R0011 ASTRONAUT REQUEST THROUGH DSKY V37E21E

R0012 SUBROUTINES CALLED-

R0013

R0014 GCFERF4

R0015 GCFEASH

R0016 THISPREC

R0017 CTRPREC

R0018 LAT-LONG

R0019 NORMAL EXIT MODES-

R0020

R0021 ASTRONAUT REQUEST THROUGH DSKY TO TERMINATE PROGRAM V34E

R0022 ALARM OR ABORT EXIT MODES-

R0023

R0024 NONE

R0025 CLTFUT -

R0026

R0027 ACTUAL DISPLAY OF OPTION CODE AND VEHICLE WHOSE GROUND TRACK IS TO BE

R0028 COMPLETED

R0029 OPTION CODE 00002

R0030 THIS 0001

R0031 OTHER 00002

R0032 DECIMAL DISPLAY OF TIME TO BE INTEGRATED TO HOURS, MINUTES, SECONDS

R0033 DECIMAL DISPLAY OF LAT, LONG, ALT

R0034 ERASABLE INITIALIZATION REQUIRED

R0035

R0036 AXC 2DEC 4.652459653 E-5 RADIANS 268-69 CONSTANTS"

R0037

R0038 -AYC 2DEC 2.147535898 E-5 RADIANS

R0039

R0040 AZC 2DEC .7753206164 REVOLUTIONS

R0041 FOR LUNAR ORBITS 504LM VECTOR IS NEEDED

R0042

R0043 504LM 2DEC -2.705340600 E-5 RADIANS

R0044

R0045 504LM _2 2DEC -7.514128400 E-4 RADIANS

R0046

R0047 504LM _4 2DEC -2.553198641 E-4 RADIANS

R0048

R0049 NONE

R0050 DEFERIS

L GROUND TRACKING DETERMINATION PROGRAM - P21

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RC051
RC052 CENTRALS-A,Q,L
RC053 OTHER-THOSE USED BY THE ABOVE LISTED SUBROUTINES
RC054 SEE LFMPRC,LAT-LONG
0055 RFF 8 LAST 494 30,2000 SPANK= LCWSUFR FOR LOW 2CAGR'S.

0056 33,2200 BANK 33
0057 RFF 8 LAST 608 24,2000 SFTLCC P21S
0058 24,3515 BANK

0059 RFF 4 LAST 240 F7,1762 FRANK= P21TIME
0060 RFF 1 COUNT* 1/P21

0061 RFF 80 LAST 615 24,3515 3 4753 1 PRG21 CAF ONE
0062 RFF 3 LAST 495 24,3516 55'144 0 TS OPTION2 ASSUMED VEHICLE IS LM , R2 = 00001
0063 RFF 36 LAST 653 24,3507 3 4752 0 CAF HIT2 OPTICN 2
0064 RFF 167 LAST 630 24,3510 0 4616 1 TC BANKCALL
0065 RFF 2 LAST 495 24,3511 20634 1 CADR GCPRF4
0066 RFF 9 LAST 620 24,3512 0 6001 0 TC GCTCPRCH TERMINATE
0067 24,3513 0 3515 0 TC +2 PROCEED VALUE OF ASSUMED VEHICLE CK
0068 24,3514 0 3507 0 TC -5 R2 LOADED THROUGH DSKY
00682 RFF 126 LAST 653 24,3515 3 4755 1 CAF ZPRC INITIAL TIME = PRESENT TIME
00684 RFF 23 LAST 575 24,3516 55'144 1 TS DSPTFM1
00686 RFF 24 LAST 655 24,3517 55'045 0 TS DSPTFM1 +1
0069 RFF 1 24,3520 3 3674 1 P21PRG1 CAF V6A34 LCAD DESIRED TIME OF LAT-LONG.
0070 RFF 168 LAST 655 24,3521 0 4616 1 TC BANKCALL
0071 RFF 11 LAST 630 24,3522 20477 1 CADR GCFLASH
0072 RFF 10 LAST 655 24,3523 0 6001 0 TC GCTOPCONH TERM
0073 24,3524 0 3526 0 TC +2 PROCEED VALUES OK
0074 24,3525 0 3520 0 TC -5 TIME LOADED THROUGH DSKY
0075 RFF 71 LAST 653 24,3526 0 6042 1 TC INTERPT
0076 24,3527 53145 1 CLCAD BZF
0077 RFF 25 LAST 655 24,3530 01045 1 DSPTFM1
00775 RFF 1 24,3531 51666 0 P21PRTM P21PRTM
0078 RFF 24 LAST 645 24,3532 34041 0 P21PRG2 STCALL TCEC1 INTEG TC TIME SPECIFIED IN TCEC1
0079 RFF 18 LAST 612 24,3533 27412 0 INTSTALL
0080 24,3534 43014 0 PCN CLEAR
0081 RFF 1 24,3535 00004 0 P21FLAG
0082 RFF 1 24,3536 51554 1 P21CCNT ON---RECYCLE USING BASE VECTOR
0083 RFF 17 LAST 587 24,3537 01674 0 VINTFLAG OFF---1ST PASS CALL BASE VECTOR
0084 24,3540 70525 0 SICAD SR1
0085 RFF 4 LAST 655 24,3541 01145 0 OPTION2
0086 24,3542 43030 0 PHIZ SET
0087 24,3543 51545 1 +2 ZERO---THIS VEHICLE(LM)
0088 RFF 18 LAST 655 24,3544 01474 1 VINTFLAG ONE---OTHER VEHICLE(OM)
0089 24,3545 43014 0 CLEAR
0090 RFF 12 LAST 587 24,3546 01676 1 DIMOFLAG
0091 RFF 6 LAST 587 24,3547 01673 1 INTYPFLG PRECISION
0092 24,3550 77624 1 CALL
0093 RFF 9 LAST 588 24,3551 27135 0 INTEGRV CALCULATE
0094 24,3552 77650 1 GCTC -AND

```

L GROUND TRACKING DETERMINATION PROGRAM - P21

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0095	REF	1		24,3553	51575 1	P21VSAVE	-SAVE BASE VECTOR
0096				24,3554	77775 1	P21CCNT	VLCAD
0097	REF	2	LAST	145	24,3555	03676 0	P21BASER
0098	REF	5	LAST	497	24,3556	25535 0	STCVL
0099	REF	2	LAST	145	24,3557	03704 1	P21BASEV
0100	REF	4	LAST	322	24,3558	15542 1	STOCL
0101	REF	5	LAST	655	24,3559	03763 0	P21TIME
0102	REF	5	LAST	497	24,3560	01517 0	STCRF
0103					24,3561	43014 0	CLEAR
0104	REF	12	LAST	655	24,3562	01676 1	DTMOFLAG
0105	REF	1			24,3563	00262 0	MCCNFLAG
0106					24,3564	53135 0	BZE
0107	REF	1			24,3565	01162 1	P21CRIG
0108					24,3566	51573 1	+3
0109					24,3567	77614 1	SET
0110	REF	2	LAST	656	24,3568	00063 1	MCCNFLAG
0111					24,3569	77624 1	+3 CALL
0112	REF	1			24,3570	27110 1	INTEGRVS
0113					24,3571	77745 1	P21VSAVE
0114	REF	7	LAST	592	24,3572	00015 0	CLCAD
0115	REF	6	LAST	656	24,3573	27763 0	TAT
0116	REF	4	LAST	496	24,3574	00017 1	P21TIME
0117	REF	3	LAST	656	24,3575	27676 0	STCVL
0118	REF	7	LAST	496	24,3576	00025 0	RATT1
0119	REF	3	LAST	656	24,3577	03704 1	P21BASER
01191					24,3578	52646 0	VATT1
01192					24,3579	57576 1	P21BASEV
01193	REF	2	LAST	318	24,3580	27712 0	SL*
01194	REF	11	LAST	620	24,3581	00001 0	0,2
01195					24,3582	50256 0	P21VEL
01196	REF	9	LAST	640	24,3583	00007 0	RATT
01197					24,3584	67471 0	UNIT
01198	REF	4	LAST	656	24,3585	03712 0	DCT
01199	REF	3	LAST	318	24,3586	03714 0	VATT
0120					24,3587	67334 1	ASIN
0121	REF	2	LAST	656	24,3588	01162 0	P21VEL
0122	REF	5	LAST	655	24,3589	01145 0	STCRE
0123					24,3590	46142 1	SMA,2
0124					24,3591	51624 0	P21CRIG
0125					24,3592	77650 1	CPTICK2
0126					24,3593	51627 0	B-IZ
0127					24,3594	77614 1	+3
0128	REF	13	LAST	612	24,3595	04307 1	GOTO
0129	REF	1			24,3596	51631 1	+4
0130					24,3597	77614 1	BCN
0131	REF	2	LAST	655	24,3598	00064 0	+4 SFT
0132					24,3599	67214 1	P21FLAG
0133	REF	1			24,3600	01663 0	SLCAD
0134	REF	8	LAST	651	24,3601	00051 1	LLNAFLAG
0135					24,3602	43054 1	X2
							SET

GENERATE DISPLAY DATA

L GROUND TRACKING DETERMINATION PROGRAM - P21

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0136					24,3635	51537 1		+2	C=EAPTH
0137	REF	2	LAST	656	24,3636	01463 1		LUNAFLAG	
0138					24,3637	77775 1	VLCAD		
0139	REF	12	LAST	656	24,3640	00001 0		RATT	
0140	REF	2	LAST	115	24,3641	16032 1	STCDL	ALPHAV	
0141	REF	8	LAST	656	24,3642	00015 0		TAT	
0142					24,3643	45714 0	CLPAR	CALL	
0143	REF	1			24,3644	00662 0		ERADFLAG	
0144	REF	1			24,3645	26351 1		LAT-LONG	
01442					24,3646	77605 1	OMP		MPAC = ALT, METERS B-29
01443	REF	1			24,3647	11676 0		K.O1	
01445	REF	2	LAST	318	24,3650	03716 1	STORE	P21ALT	ALT/100 FOR NS1 DISP
0145					24,3651	77776 1	EXIT		
0146	REF	1			24,3652	3 3673 0	CAF	VCEN43	DISPLAY LAT, LONG, ALT
0147	REF	169	LAST	655	24,3653	0 4616 1	TC	BANKCALL	LAT, LONG = 1/2 REVS B3
0148	REF	12	LAST	655	24,3654	20477 1	CADR	GCFLASH	ALT = KM B14
0149	REF	11	LAST	655	24,3655	0 6001 0	TC	GOTOPNOH	TERM
0150	REF	12	LAST	657	24,3656	0 6001 0	TC	GCTCPCH	
0151	REF	72	LAST	655	24,3657	0 6042 1	TC	INTPRET	V32F RECYCLE
0152					24,3660	43345 1	CLCAD	DAD	
0153	REF	7	LAST	656	24,3661	02762 0		P21TIME	
0154	REF	1			24,3662	11672 1		600SEC	600 SECONDS OF 10 MIN
0155	REF	26	LAST	655	24,3663	01045 1	STORE	DSPTM1	
0156					24,3664	77624 0	RIB		
0157	REF	1			24,3665	51520 1		P21PRCG1	
01572					24,3666	52034 1	P21PRTM	PTE	
01574	REF	13	LAST	592	24,3667	21574 1		LCADTIME	
01576	REF	1			24,3670	51532 1		P21PRCG2	
0158					24,3671	00003 1	600SEC	2DEC	10 MIN
0158					24,3672	25140 0			
0159					24,3673	01453 1	VCEN43	VM	00643
0160					24,3674	01442 1	VEN34	VM	00634
01602					24,3675	01243 1	K.O1	2DEC	.01
01602					24,3676	32703 1			

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P0010 TRANSFER PHASE INITIATION (TPI) PROGRAMS (P34 AND P74)

R0011 MOD NO -1 LCC SECTION - P32-P35, P72-P75

R0012 MOD BY WHITE.P DATE 1JUN67

R0013 PURPOSE

R0014 (1) TO CALCULATE THE REQUIRED DELTA V AND OTHER INITIAL CONDITIONS
R0015 REQUIRED BY THE ACTIVE VEHICLE FOR EXECUTION OF THE TRANSFER
R0016 PHASE INITIATION (TPI) MANEUVER, GIVEN -

R0017 (A) TIME OF IGNITION TIG (TPI) OR THE ELEVATION ANGLE (E) OF
R0018 THE ACTIVE/PASSIVE VEHICLE LOS AT TIG (TPI).

R0019 (E) CENTRAL ANGLE OF TRANSFER (CENTANG) FROM TIG (TPI) TO
R0020 INTERCEPT TIME (TIG (TPF)).

R0021 (2) TO CALCULATE TIG (TPI) GIVEN E CP E GIVEN TIG (TPI).

R0022 (3) TO CALCULATE THESE PARAMETERS BASED UPON MANEUVER DATA
R0023 APPROVED AND KEYED INTO THE DSKY BY THE ASTRONAUT.

R0024 (4) TO DISPLAY TO THE ASTRONAUT AND THE GROUND CERTAIN DEPENDENT
R0025 VARIABLES ASSOCIATED WITH THE MANEUVER FOR APPROVAL BY THE
R0026 ASTRONAUT/CP/CD.

R0027 (5) TO STOPP THE TPI TARGET PARAMETERS FOR LSE BY THE DESIRED
R0028 THRUSTING PROGRAM.

R0029 ASSUMPTIONS

R0030 (1) LM ONLY - THIS PROGRAM IS BASED UPON PREVIOUS COMPLETION OF
R0031 THE CONSTANT (FLTA ALTITUDE (CDH) PROGRAM (F33/P73).
R0032 THEREFORE -

R0033 (A) AT A SELECTED TPI TIME (NOW IN STORAGE) THE LINE OF SIGHT
R0034 BETWEEN THE ACTIVE AND PASSIVE VEHICLES WAS SELECTED TO BE
R0035 A PRESCRIBED ANGLE (E) (NOW IN STORAGE) FROM THE
R0036 HORIZONTAL PLANE DEFINED BY THE ACTIVE VEHICLE POSITION.

R0037 (B) THE TIME BETWEEN CDH IGNITION AND TPI IGNITION WAS
R0038 COMPLETED TO BE GREATER THAN 10 MINUTES.

R0039 (C) THE VARIATION OF THE ALTITUDE DIFFERENCE BETWEEN THE
R0040 ORBITS WAS MINIMIZED.

R0041 (D) THE PERICENTER ALTITUDES OF CREITS FOLLOWING CSI AND

R0042 CDH WERE COMPUTED TO BE GREATER THAN 35,000 FT FOR LUNAR

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USER'S PAGE NO. 2 FC 53

R0043 CPBIT CP 85 NM FOR EARTH CRBIT.

R0044 (E) THE CSI AND CFE MANEUVERS WERE ASSUMED TO BE PARALLEL TO
R0045 THE PLANE OF THE PASSIVE VEHICLE CRBIT. HOWEVER, CREW
R0046 MODIFICATION OF DELTA V (LV) COMPONENTS MAY HAVE RESULTED
R0047 IN AN OUT-OF-PLANE MANEUVER.

R0048 (2) STATE VECTOR UPDATES BY P27 ARE DISALLOWED DURING AUTOMATIC
R0049 STATE VECTOR UPDATING INITIATED BY P20 (SEE ASSUMPTION (4)).

R0050 (3) THIS PROGRAM MUST BE DONE OVER A TRACKING STATION FOR REAL
R0051 TIME GROUND PARTICIPATION IN DATA INPUT AND OUTPUT. COMPLETED
R0052 VARIABLES MAY BE STORED FOR LATER VERIFICATION BY THE GROUND.
R0053 THESE STORAGE CAPABILITIES ARE LIMITED ONLY TO THE PARAMETERS
R0054 FOR ONE THRUSTING MANEUVER AT A TIME EXCEPT FOR CONCENTRIC
R0055 FLIGHT PLAN MANEUVER SEQUENCES.

R0056 (4) THE RENDEZVOUS RADAR MAY OR MAY NOT BE USED TO UPDATE THE LM
R0057 OR CSM STATE VECTORS FOR THIS PROGRAM. IF RADAR USE IS
R0058 DESIRED THE RADAR WAS TURNED ON AND LOCKED ON THE CSM BY
R0059 PREVIOUS SELECTION OF P20. RADAR SIGHTING MARKS WILL BE MADE
R0060 AUTOMATICALLY APPROXIMATELY ONCE A MINUTE WHEN ENABLED BY THE
R0061 TRACK AND UPDATE FLAGS (SEE P20). THE RENDEZVOUS TRACKING
R0062 MARK COUNTER IS ZEROED BY THE SELECTION OF P20 AND AFTER EACH
R0063 THRUSTING MANEUVER.

R0064 (5) THE ISS NEED NOT BE ON TO COMPLETE THIS PROGRAM.

R0065 (6) THE OPERATION OF THE PROGRAM UTILIZES THE FOLLOWING FLAGS -

R0066 ACTIVE VEHICLE FLAG - DESIGNATES THE VEHICLE WHICH IS
R0067 DOING RENDEZVOUS THRUSTING MANEUVERS TO THE PROGRAM WHICH
R0068 CALCULATES THE MANEUVER PARAMETERS. SET AT THE START OF
R0069 EACH RENDEZVOUS PRE-THRUSTING PROGRAM.

R0070 FINAL FLAG - SELECTS FINAL PROGRAM DISPLAYS AFTER CREW HAS
R0071 SELECTED THE FINAL MANEUVER COMPUTATION CYCLE.

R0072 EXTERNAL DELTA V FLAG - DESIGNATES THE TYPE OF STEERING
R0073 EQUIPPED FOR EXECUTION OF THIS MANEUVER BY THE THRUSTING
R0074 PROGRAM SELECTED AFTER COMPLETION OF THIS PROGRAM.

R0075 (7) ONCE THE PARAMETERS REQUIRED FOR COMPLETION OF THE MANEUVER
R0076 HAVE BEEN COMPLETELY SPECIFIED, THE VALUE OF THE ACTIVE
R0077 VEHICLE CENTRAL ANGLE OF TRANSFER IS COMPUTED AND STORED.
R0078 THIS NUMBER WILL BE AVAILABLE FOR DISPLAY TO THE ASTRONAUT
R0079 THROUGH THE USE OF VO6A52.

R0080 THE ASTRONAUT WILL CALL THIS DISPLAY TO VERIFY THAT THE
R0081 CENTRAL ANGLE OF TRANSFER OF THE ACTIVE VEHICLE IS NOT WITHIN

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LSEP'S PAGE NO. 2 EC 53

R0082 170 TO 190 DEGREES. IF THE ANGLE IS WITHIN THIS ZONE THE
 R0083 ASTRONAUT SHOULD REASSESS THE INPUT TARGETING PARAMETERS BASED
 R0084 UPON DELTA V AND EXPECTED MANEUVER TIME.

R0085 (8) THIS PROGRAM IS SELECTED BY THE ASTRONAUT BY DSKY ENTRY -

R0086 P34 IF THIS VEHICLE IS ACTIVE VEHICLE.

R0087 P74 IF THIS VEHICLE IS PASSIVE VEHICLE.

R0088 INFLT

R0089 (1) TTPI TIME OF THE TPI MANEUVER
 R0090 (2) ELEV DESIRED LOS ANGLE AT TPI
 R0091 (3) CNTANG ORBITAL CENTRAL ANGLE OF THE PASSIVE VEHICLE DURING
 R0092 TRANSFER FROM TPI TO TIME OF INTERCEPT

R0093 OUTPUT

R0094 (1) TPKMKCNT NUMBER OF MARKS
 R0095 (2) TTIOC TIME TO GO
 R0096 (3) +MCA MIDDLE CINEAL ANGLE
 R0097 (4) TTPI COMPUTED TIME OF TPI MANEUVER
 R0098 CP
 R0099 ELEV COMPUTED LOS ANGLE AT TPI
 R0100 (5) POSTTPI PERIGEE ALTITUDE AFTER THE TPI MANEUVER
 R0101 (6) DELVTPI MAGNITUDE OF DELTA V AT TPI
 R0102 (7) DELVTPE MAGNITUDE OF DELTA V AT INTERCEPT
 R0103 (8) PVLOS DELTA V VELOCITY AT TPI - LINE OF SIGHT
 R0104 (9) DELVLVC DELTA VELOCITY AT TPI - LOCAL VERTICAL COORDINATES

R0105 DOWNLINK

R0114 (1) TTPI TIME OF THE TPI MANEUVER
 R0115 (2) TIG TIME OF THE TPI MANEUVER
 R0116 (3) ELEV DESIRED LOS ANGLE AT TPI
 R0117 (4) CNTANG ORBITAL CENTRAL ANGLE OF THE PASSIVE VEHICLE DURING
 R0118 TRANSFER FROM TPI TO TIME OF INTERCEPT
 R0119 (5) DELVEET3 DELTA VELOCITY AT TPI - REFERENCE COORDINATES
 R0120 (6) TPASS4 TIME OF INTERCEPT
 R0121 COMMUNICATION TO THRUSTING PROGRAMS

R0122 (1) TIG TIME OF THE TPI MANEUVER
 R0123 (2) RTAPG OFFSET TARGET POSITION
 R0124 (3) TPASS4 TIME OF INTERCEPT
 R0125 (4) XDELVELG RESET TO INDICATE LAMBERT (AIMPOINT) VG COMPLETION

R0126 SUBROUTINES USED

R0127 AVFLAC

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R0128 AVFLAGF
 R0129 VAPCONF
 R0130 DISPLAYF
 R0131 SELECTMU
 R0132 PRECSET
 R0133 S23/34.1
 R0134 ALARM
 R0135 PANKCALL
 R0136 GCFLASH
 R0137 GOTOPOOH
 R0138 TIMEFRET
 R0139 S24/35.2
 R0140 PFRIAP01
 R0141 SHIFTRI
 R0142 S24/35.5
 R0143 VN1645

0144	REF	3	LAST	652	35,2000				SETLCC CSI/CDH	
0145					25,2455				BANK	
0146	REF	15	LAST	652	27,1470				EBANK= SUBFXIT	
0147	REF	1							CCUNT* 41/P3474	
0148	REF	3	LAST	630	35,2455	0	2354	1	P24	TC AVFLAGA
0149	REF	1			35,2456	0	2460	1		TC P34/P74A
0150	REF	2	LAST	630	35,2457	0	2361	1	P74	TC AVFLACP
0151	REF	3	LAST	630	35,2460	0	2366	0	P24/P74A	TC P2 FLGON
01515	REF	2	LAST	625	35,2461	3	3632	0		CAF VOEN37
0152	REF	10	LAST	632	35,2462	0	3621	1		TC VAPCONF
01521					35,2463	0	0006	1		EXTEND
01522	REF	1			35,2464	3	3655	1		DCA 120DFG
01523	REF	5	LAST	637	35,2465	53	1621	1		EXCH CENTANG
01528	REF	10	LAST	647	35,2466	3	2424	1		CAF P20ZERO
01529	REF	5	LAST	635	35,2467	55	1466	0		TS NA
0153	REF	1			35,2470	0	2603	1		TC DISPLAYE
0154	REF	73	LAST	657	35,2471	0	6042	1		TC INTPRET
0155					35,2472	7	1214	0		CLEAR CLCAC
0156	REF	1			35,2473	0	1270	0		ETPIFLAG
0157	REF	14	LAST	647	35,2474	0	3636	1		TTPI
0158	REF	12	LAST	645	35,2475	1	7442	0		TIC
0159	REF	6	LAST	640	35,2476	0	2257	0		FLEV
0160					35,2477	4	3054	1		PZF SET
0161	REF	1			35,2500	7	2502	0		P34/P74B
0162	REF	2	LAST	661	35,2501	0	1171	1		ETPIFLAG
0163					35,2502	7	7624	1	P34/P74B	CALL
0164	REF	3	LAST	630	35,2503	2	0000	0		SELECTML
0165					0032				DELELC	EQUALS 26C
0166					25,2504	4	3145	0	P34/P74C	CLCAC SET
0167	REF	7	LAST	612	35,2505	0	6524	1		ZFROVECS
0168	REF	2	LAST	630	35,2506	0	3460	0		ITSWICH
0169					35,2507	4	3014	0	P34	CLEAR
0170	REF	3	LAST	661	35,2510	0	1310	1		ETPIFLAG

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0171	REF	1			35,2511	72512	0	SWCHSET		
0172	REF	3	LAST	661	35,2512	03660	1	1TSW1CH		
0173	REF	4	LAST	631	35,2513	02317	0	SWCHSET	STORE	
0174					35,2514	43345	1	INTLOCP	DL0AC	0AD
0175	REF	15	LAST	661	35,2515	03636	1			TTF1
0176	REF	5	LAST	662	35,2516	02317	0			1NMTPI
0177	REF	25	LAST	655	35,2517	34041	0		STCALL	1PSC1
0178	REF	3	LAST	645	35,2520	46403	1			PRECSET
0179					35,2521	77624	1		CALL	
0180	REF	2	LAST	630	35,2522	72674	1			S23/34.1
0181					35,2523	77454	1		PZF	EXIT
0182	REF	1			35,2524	72535	1			SWCHCLR
0183	REF	28	LAST	630	35,2525	05567	0	TC		ALARM
0184					35,2526	00611	1	CTT		611
0185	REF	3	LAST	630	35,2527	35006	1	CAF		VCENCS
0186	REF	170	LAST	657	35,2530	04616	1	TC		BANKCALL
0187	REF	13	LAST	657	35,2531	20477	1	CADR		GRFLASH
0188	REF	13	LAST	657	35,2532	06000	0	TC		GCTOPPOH
0189	REF	2	LAST	661	35,2533	02460	1	TC		P34/P74A
0190					35,2534	02525	1	TC		-7
										PROCCED
										V32
0191					35,2535	43014	0	SWCHCLR	PCNCLR	REN
0192	REF	4	LAST	662	35,2536	03660	1			1TSW1CH
0193	REF	1			35,2537	72514	1			INTLOCP
0194	REF	4	LAST	661	35,2540	01310	1			FTPTIFAC
0195	REF	1			35,2541	12545	0			P34/P74D
0196					35,2542	77776	1			DISPLAY TTF1
0197	REF	2	LAST	661	35,2543	03603	1	TC		DISPLAYF
0198	REF	1			35,2544	02550	0	TC		P34/P74E
0199					35,2545	77776	1	P34/P74C	EXIT	
0200	REF	3	LAST	661	35,2546	22632	0	CAF		VC6N37
0201	REF	11	LAST	661	35,2547	03621	1	TC		VNPOOH
0202	REF	74	LAST	661	35,2550	06042	1	P34/P74F	TC	INTPRT
0203					35,2551	71201	1	STPD		DICAD
0204					35,2552	00001	0			00
0205	REF	5	LAST	644	35,2553	02777	1			RTx1
0206	REF	12	LAST	651	35,2554	14047	1	STCDL		XJ
0207	REF	6	LAST	661	35,2555	03621	1			CENTANG
0208					35,2556	71406	0	PLSH		CES
0209	REF	4	LAST	650	35,2557	16732	0	STCDL		CSTH
0210					35,2558	77756	0	SN		
0211	REF	6	LAST	650	35,2561	26720	1	STCVL		SNTH
0212	REF	6	LAST	645	35,2562	03552	0			PPASS3
0213					35,2563	77657	0	VSR*		
0214					35,2564	57176	0			0,2
0215	REF	6	LAST	650	35,2565	26655	0	STCVL		PVEC
0216	REF	3	LAST	645	35,2566	03560	1			VFASS3
0217					35,2567	43057	1	VSR*		SET
0218					35,2570	57176	0			0,2
0219	REF	6	LAST	650	35,2571	03466	0			RVS*

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0220	REF	7	LAST	650	35,2572	36744 0	STCALL	VVSC	
0221	REF	5	LAST	650	35,2572	24732 1		TIME THE T	
0222					35,2574	77745 1	CLOAD		
0223	REF	16	LAST	662	35,2575	03636 1		TTFI	
0224	REF	1			35,2576	03610 0	STORE	INTIME	FOR INITVEL
0225					35,2577	77615 0	CAC		
0226	REF	2	LAST	496	35,2600	00037 0		T	RENDEZVOUS TIME
0227	REF	3	LAST	199	35,2611	37631 1	STCALL	TPASS4	FOR INITVEL
0228	REF	1			35,2602	73216 0		S34/35.2	
0229					35,2603	51575 1	VLOAD	ABVAL	
0230	REF	3	LAST	199	35,2604	02366 0		DELVEET3	
0231	REF	4	LAST	316	35,2605	27576 0	STCVL	DELVTPI	
0232	REF	1			35,2606	03516 1		VPASS4	
0233					35,2607	51451 0	VSV	ABVAL	
0234	REF	1			35,2610	03566 1		VTPRIME	
0235	REF	3	LAST	316	35,2611	26350 0	STOVL	DELVTPI	
0236	REF	8	LAST	645	35,2612	03536 1		RACT3	
0237					35,2613	45115 0	PDVL	CALL	
0238	REF	1			35,2614	02337 1		VIPRIME	
0239	REF	3	LAST	640	35,2615	46341 0		PEPIAPCI	
0240					35,2616	77624 1	CALL		
0241	REF	8	LAST	651	35,2617	46451 0		SHIFTFI	
0242	REF	4	LAST	316	35,2620	17606 1	STCDL	PCSTTFI	
0243	REF	17	LAST	663	35,2621	03636 1		TTFI	
0244	REF	14	LAST	661	35,2622	03442 0	STORE	TIG	
0245					35,2622	77776 1	EXIT		
0246	REF	1			35,2624	33634 0	CAF	VJEN58	
0247	REF	12	LAST	662	35,2625	03621 1	TC	VNPOCH	
0248	REF	75	LAST	662	35,2626	06042 1	TC	INTPRET	
0249					35,2627	77624 1	CALL		
0250	REF	1			35,2630	73432 0		S34/35.5	
0251					35,2631	77624 1	CALL		
0252	REF	4	LAST	631	35,2632	73515 1		VN1645	
0253					35,2633	77650 1	COTC		
0254	REF	1			35,2634	72504 0		P34/P74C	

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P0255 RENDEZVOUS MID-COURSE MANEUVER PROGRAMS (P35 AND P75)

R0256 MOD NO -1 LCG SECTION - F32-F35, F72-P75

R0257 MOD BY WHITE.P DATE 1JUN67

R0258 PLPPOSE

R0259 (1) TO CALCULATE THE REQUIRED DELTA V AND OTHER INITIAL CONDITIONS
R0260 REQUIRED BY THE ACTIVE VEHICLE FOR EXECUTION OF THE NEXT
R0261 MIDCOURSE CORRECTION OF THE TRANSFER PHASE OF AN ACTIVE
R0262 VEHICLE RENDEZVOUS.

R0263 (2) TO DISPLAY TO THE ASTRONAUT AND THE GROUND CERTAIN DEPENDENT
R0264 VARIABLES ASSOCIATED WITH THE MANEUVER FOR APPROVAL BY THE
R0265 ASTRONAUT/GROUND.

R0266 (3) TO STORE THE TEN TARGET PARAMETERS FOR USE BY THE DESIRED
R0267 THRUSTING PROGRAM.

R0268 ASSUMPTIONS

R0269 (1) THE ISS NEED NOT BE ON TO COMPLETE THIS PROGRAM.

R0270 (2) STATE VECTOR UPDATES BY P27 ARE DISALLOWED DURING AUTOMATIC
R0271 STATE VECTOR UPDATING INITIATED BY P20 (SEE ASSUMPTION (2)).

R0272 (3) THE RENDEZVOUS RADAR IS ON AND IS LOCKED ON THE CSM. THIS WAS
R0273 DONE DURING PREVIOUS SELECTION OF P27. RADAR SIGHTING MARKS
R0274 WILL BE MADE AUTOMATICALLY APPROXIMATELY ONCE A MINUTE WHEN
R0275 ENABLED BY THE TRACK AND UPDATE FLAGS (SEE P20). THE
R0276 RENDEZVOUS TRACKING MARK COUNTER IS ZEROED BY THE SELECTION OF
R0277 P20 AND AFTER EACH THRUSTING MANEUVER.

R0278 (4) THE OPERATION OF THE PROGRAM UTILIZES THE FOLLOWING FLAGS -

R0279 ACTIVE VEHICLE FLAG - DESIGNATES THE VEHICLE WHICH IS
R0280 DOING RENDEZVOUS THRUSTING MANEUVERS TO THE PROGRAM WHICH
R0281 CALCULATES THE MANEUVER PARAMETERS. SET AT THE START OF
R0282 EACH RENDEZVOUS PRE-THRUSTING PROGRAM.

R0283 FINAL FLAG - SELECTS FINAL PROGRAM DISPLAYS AFTER CREW HAS
R0284 SELECTED THE FINAL MANEUVER COMPUTATION CYCLE.

R0285 EXTERNAL DELTA V FLAG - DESIGNATES THE TYPE OF STEERING
R0286 REQUIRED FOR EXECUTION OF THIS MANEUVER BY THE THRUSTING
R0287 PROGRAM SELECTED AFTER COMPLETION OF THIS PROGRAM.

R0288 (5) THE TIME OF INTERCEPT (TINT)) WAS DEFINED BY PREVIOUS
R0289 COMPLETION OF THE TRANSFER PHASE INITIATION (TPI) PROGRAM
R0290 (P34/P74) AND IS PRESENTLY AVAILABLE IN STORAGE.

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R0291 (6) ONCE THE PARAMETERS REQUIRED FOR COMPUTATION OF THE MANEUVER
 R0292 HAVE BEEN COMPLETELY SPECIFIED, THE VALUE OF THE ACTIVE
 R0293 VEHICLE CENTRAL ANGLE OF TRANSFER IS COMPUTED AND STORED.
 R0294 THIS NUMBER WILL BE AVAILABLE FOR DISPLAY TO THE ASTRONAUT
 R0295 THROUGH THE USE OF V06N52.

R0296 THE ASTRONAUT WILL CALL THIS DISPLAY TO VERIFY THAT THE
 R0297 CENTRAL ANGLE OF TRANSFER OF THE ACTIVE VEHICLE IS NOT WITHIN
 R0298 170 TO 190 DEGREES. IF THE ANGLE IS WITHIN THIS ZONE THE
 R0299 ASTRONAUT SHOULD REASSESS THE INPUT TARGETING PARAMETERS BASED
 R0300 UPON ΔV AND EXPECTED MANEUVER TIME.

R0301 (7) THIS PROGRAM IS SELECTED BY THE ASTRONAUT BY PDKY ENTRY -

R0302 P35 IF THIS VEHICLE IS ACTIVE VEHICLE.

R0303 P75 IF THIS VEHICLE IS PASSIVE VEHICLE.

R0304 INPUT

R0305 (1) TPASS4 TIME OF INTERCEPT - SAVED FROM P34/P74

R0306 OUTPUT

R0307 (1) TRKMKNCT NUMBER OF MARKS

R0308 (2) TIOGO TIME TO GO

R0309 (3) θ_{MCA} MIDCPL CENTRAL ANGLE

R0310 (4) DVLES DELTA VELOCITY AT MIC - LINE OF SIGHT

R0311 (5) DELVLVC DELTA VELOCITY AT MID - LOCAL VERTICAL COORDINATES

R0312 PCWLINK

R0325 (1) TIG TIME OF THE TPM MANEUVER

R0326 (2) DELVEET2 DELTA VELOCITY AT TPM - REFERENCE COORDINATES

R0327 (3) TPASS4 TIME OF INTERCEPT

R0328 COMMUNICATION TO THRUSTING PROGRAMS

R0329 (1) TIG TIME OF THE TPM MANEUVER

R0330 (2) RTAPE OFFSET TARGET POSITION

R0331 (3) TPASS4 TIME OF INTERCEPT

R0332 (4) XDELVELO RESET TO INDICATE LAMBERT (AIMPOINT) VG COMPUTATION

R0333 SUBROUTINES USED

R0334 AVFLACA

R0335 AVFLAGP

R0336 LCACTIME

R0337 SELECTMU

R0338 PRECSET

R0339 S34/35.1

R0340 S34/35.2

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R0341 S34/35.5
R0342 VN1645

0343	PEF	2	LAST	653	TC	655:	14	14*	CCUNT*	\$\$/P3575	
0344	PEF	1				F7,1575			EBANK=	KT	
0345	PEF	4	LAST	661		35,2635	0	2354	1	P35	TC AVFLACA
0346						35,2636	0	0006	1		EXTEND
0347	PEF	3	LAST	388		35,2637	3	1401	0		CCA ATIGINC
0348	PEF	1				35,2640	0	2644	0		TC P35/P75A
0349	REF	4	LAST	661		35,2641	0	2361	1	P75	TC AVFLAGP
0350						35,2642	0	0006	1		EXTEND
0351	PEF	1				35,2643	3	1403	1		CCA PTIGINC
0352	PEF	2	LAST	666		35,2644	53	1576	0	P35/P75A	DXCH KT
03525	PEF	4	LAST	661		35,2645	0	2366	0		TC P20FLGON
											SET UPDATEFLG, TRACKFLG
0353	PEF	76	LAST	662		35,2646	0	6042	1		TC INTERPT
0355						35,2647	7	7624	1		CALL
0360	PEF	4	LAST	661		35,2650	2	7000	0		SELECTMU
0361						35,2651	7	7634	0	P35/P75E	PTR
0362	PEF	14	LAST	657		35,2652	2	1574	1		LCADTIME
03621	PEF	2	LAST	284		35,2653	0	2612	1		STORE TSTRT
03622						35,2654	7	7615	0		DAD
03623	PEF	3	LAST	666		35,2655	0	3576	0		KT
03624	PEF	15	LAST	662		35,2656	0	3442	0		STORE TIC
0363	PEF	2	LAST	662		35,2657	0	3610	0		STORE INTIME
											FOR INITVEL
0364	PEF	26	LAST	662		35,2660	2	4741	0		STCALL TCFC1
0365	PEF	4	LAST	662		35,2661	4	6403	1		PRECSET
											ADVANCE BCIF VEHICLES
0366						35,2662	7	7624	1		CALL
0367	PEF	1				35,2663	7	3204	0		S34/35.1
											GET NCFM AND LCS FOR TRANSFORM
0368						35,2664	7	7624	1		CALL
0369	PEF	2	LAST	662		35,2665	7	3216	0		S34/35.2
											GET DELTA V(LV)
0370						35,2666	7	7624	1		CALL
0371	PEF	2	LAST	663		35,2667	7	3432	0		S34/35.5
0372						35,2670	7	7624	1		CALL
0373	PEF	5	LAST	663		35,2671	7	3515	1		VN1645
0375						35,2672	7	7650	1		CONT
0380	PEF	1				35,2673	7	2651	0		P35/P75E

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P0391 S23/34.1

0382				35,2674	66220 1	S23/34.1 STC	SSP	
0383	RFF	4	LAST	623	35,2675	13463 0	NCPMEX	
0384	RFF	1			35,2676	03614 1	TITER	
0385					35,2677	40000 0	40000	
0386					35,2705	41345 1	ELCAC	SETPD
0387	RFF	1			35,2701	33643 0		MAX251
0388					35,2712	02001 0		OD
0389	RFF	1			35,2703	27574 1	STCVL	SECMAX
0390	RFF	9	LAST	663	35,2704	03536 1		RACT3
0391	RFF	1			35,2715	27500 1	STOVL	RAPREC
0392	RFF	8	LAST	651	35,2706	13544 1		VACT3
0393	RFF	1			35,2707	27506 1	STCVL	VAPREC
0394	RFF	7	LAST	662	35,2710	03552 0		RPASS3
0395	RFF	1			35,2711	27522 1	STCVL	RPREC
0396	RFF	4	LAST	662	35,2712	13560 1		VPASS2
0397	RFF	1			35,2713	13530 1	STORE	VFPREC
0398					35,2714	77624 1	ELCALC	CALL
0399	RFF	2	LAST	666	35,2715	73214 0		S34/35.1
0400					35,2716	63235 0	VXV	PEVL
0401	RFF	10	LAST	667	35,2717	03536 1		RACT3
0402					35,2720	03515 1	PDVL	UNIT
0403	RFF	11	LAST	667	35,2721	03536 1		RACT3
0404					35,2722	46315 1	PDVL	VPROJ
0405					35,2723	51352 1	VSL2	BVSU
0406	RFF	1			35,2724	02311 0		ULCS
0407					35,2725	63256 0	UNIT	PDVL
0408					35,2726	63241 0	DCT	PCVL
0409					35,2727	00001 0		OD
0410					35,2730	75241 1	DCT	SIGN
0411	RFF	2	LAST	667	35,2731	02311 0		ULCS
0412					35,2732	65552 0	SL1	ACCS
0413					35,2733	50315 0	PCVL	DCT
0414	RFF	3	LAST	667	35,2734	02311 0		ULCS
0415	RFF	12	LAST	667	35,2735	03536 1		RACT3
0416					35,2736	71244 0	BPL	ELCAC
0417	RFF	1			35,2737	72742 0		TESTY
0418	RFF	6	LAST	667	35,2740	06532 0		DRPOS MAX
0419					35,2741	41425 1	DSL	PUSH
0420					35,2742	71214 0	TESTY	BOFF
0421	RFF	5	LAST	662	35,2743	13740 1		DLCAJ
0422	RFF	1			35,2744	73171 1		ITSWICH
0423	RFF	1			35,2745	13576 0		FLFX
0424	RFF	1			35,2746	14133 1	STOVL	DELEL
0425					35,2747	77625 0		DELEL
0426	RFF	7	LAST	661	35,2750	12257 1	DSL	ELCV
0427	RFF	2	LAST	667	35,2751	03576 0	STORE	DELEI
0428					35,2752	45246 0	ARS	DSU
0429	RFF	1			35,2753	33647 1		ELEPS

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0430				35,2754	7740 0	BMN		
0431	REF	1		35,2755	73201 0		TIMEX	COMMERCIALS EVERYWHERE
0432				35,2756	70525 0	FIGTIME	SLOCAD	SRI
0433	REF	2	LAST	667	35,2757			TITER
0434				35,2759	72130 1	PHIZ	LXA,1	
0435	REF	5	LAST	667	35,2761			NCPMEX
0436	REF	287	LAST	641	35,2762			MPAC
0437				35,2763	77330 1	SXA,1	VLCAD	TCC MANY ITERATIONS
0438	REF	3	LAST	668	35,2764			TITER
0439	REF	8	LAST	667	35,2765			RPASS3
0440				35,2766	65256 0	UNIT	PDDL	
0441				35,2767	00045 0		36D	
0442				35,2770	53515 0	FDVL	UNIT	
0443	REF	13	LAST	667	35,2771			RACT3
0444				35,2772	77725 1	PDDL		
0445				35,2773	41525 0	FDDL	PLSH	
0446				35,2774	50545 0		36D	
0447				35,2775	77621 1	RDSU		
0448				35,2776	00015 0		12D	
0449				35,2777	14137 0	STODL	3CD	RP - RA MAGNITUDES
0450	REF	8	LAST	596	35,3000		DPHALF	
0451				35,3001	41425 1	DSU	PLSH	
0452	REF	8	LAST	667	35,3002		ELEV	
0453				35,3003	50165 0	SIGN	BMN	
0454				35,3004	00037 0		3CD	
0455	REF	6	LAST	668	35,3005		NCPMEX	
0456				35,3006	71545 0	DLCAD	CCS	
0457				35,3007	56205 0	DMP	DDV	
0458				35,3010	00017 1		14D	
0459				35,3011	00015 0		12D	
0460				35,3012	77675 0	DCOMP		SINCE CCS(1EC-A)=-CCS A
0461				35,3013	00035 1	STCRE	28D	
0462				35,3014	44246 1	ABS	BDSU	
0463	REF	9	LAST	668	35,3015		DPHALF	
0464				35,3016	77240 1	BMN	VLCAD	
0465	REF	7	LAST	668	35,3017		NCPMEX	
0466	REF	1			35,3020		UNRM	
0467				35,3021	53435 0	VXV	UNIT	
0468				35,3022	00007 0		6D	UN*RA
0469				35,3023	41241 0	FCT	DMP	
0470	REF	9	LAST	667	35,3024		VACT3	
0471				35,3025	00015 0		12D	
0472				35,3026	47215 0	FDVL	VXV	
0473				35,3027	00011 0		OD	
0474	REF	5	LAST	667	35,3030		VPASS3	
0475				35,3031	53435 0	VXV	UNIT	
0476				35,3032	00011 0		OD	(RP*VF)*RP
0477				35,3033	41241 0	FCT	DMP	
0478	REF	6	LAST	668	35,3034		VPASS3	
0479				35,3035	00017 1		14D	

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0480				25,3134	77621 1	BDSL		
0481				35,3137	63311 0	NORM	PDVL	NORMALIZED WA - WP 120
0482	REF	13	LAST	662	35,3140	00047 1	X1	
0483					35,3141	00007 0	6D	
0484					35,3142	50235 0	DCT	
0485					35,3143	00101 0	0D	
0486	REF	2	LAST	668	35,3144	02261 0	UNRM	RA*RP.UN 14C
0487					35,3145	50215 0	DCT	
0488					35,3146	00051 0	0D	
0489					35,3147	01117 0	6D	
0490					35,3150	65552 0	SL1	ACCS
0491					35,3151	77765 0	SIGN	
0492					35,3152	43225 0	DSU	DAD
0493	REF	10	LAST	668	35,3153	06922 1	DPHALF	ALPHA P1
0494	REF	9	LAST	668	35,3154	12257 0	ELEV	
0495					35,3155	65525 0	PDCL	ACES
0496					35,3156	00135 1	28D	
0497					35,3157	75221 1	BDSU	SIGN
0498	REF	11	LAST	669	35,3160	76522 1	DPHALF	
0499					35,3161	00137 1	3CD	CONTAINS RE-RA
0500					35,3162	77615 0	CAC	
0501					35,3163	56275 0	DMF	DDV
0502	REF	4	LAST	647	35,3164	33641 1	TWOPI	
0503					35,3165	77615 1	DMF	
0504					35,3166	41257 1	SL*	DMP
0505					35,3167	21170 0		0 - 3, 1
0506					35,3170	51406 1	PLSH	ABS
0507					35,3171	50025 0	DSU	BMA
0508	REF	2	LAST	667	35,3172	73574 1		SECMAX
0509	REF	1			35,3173	73077 0		CKMAX
0510					35,3174	75345 1	CLOAD	SIGN
0511	REF	3	LAST	669	35,3175	73574 1		SECMAX
0512					35,3176	77606 1	PLSH	
0513					35,3177	51135 1	OKMAX	
0514	REF	4	LAST	668	35,3100	03614 1	SLOC	BPL
0515	REF	1			35,3101	73107 0		TITER
0516					35,3102	71331 0	SSP	REPE
0517	REF	5	LAST	669	35,3103	03614 1		REPE
0518					35,3104	37777 1	DCT	37777
0519					35,3105	77650 1	CCTC	
0520	REF	1			35,3106	72145 0		STCRDCLT
0521					35,3107	41345 0	REPETE	DMP
0522	REF	2	LAST	667	35,3110	03576 0		DELEFL
0523	REF	2	LAST	667	35,3111	01033 1		DELEFLC
0524					35,3112	71244 0	BPL	PLCAC
0525	REF	1			35,3113	73123 0		NEXTES
0526	REF	4	LAST	669	35,3114	73574 1		SECMAX
0527					35,3115	77605 1	DMF	
0528	REF	1			35,3116	22645 0		THIRD
0529	REF	5	LAST	669	35,3117	17574 1	STOCL	SECMAX

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0530					35,312	70446 0	ABS	SRI	CROSSED OVER SOLUTION
0531					35,3121	52776 1	DCOMP	GOTC	DT=(-SIGN(DTC))/DT1//2
0532	REF	1			35,3122	73133 1		RESIGN	
0533					35,3123	51545 1	NEXTES	DLOAD	ABS
0534	REF	4	LAST	665	35,3124	03575 0		DELEL	
0535					35,3125	51525 1	PDDL	AES	
0536	REF	3	LAST	665	35,3126	00333 1		DELELC	
0537					35,3127	77625 1	DSL		
0538					35,3128	71240 1	BMA	DLOAD	
0539	REF	1			35,3131	73136 1		REVER5	WRONG DIRECTION
0540					35,3132	77646 1	ABS		
0541					35,3133	52155 1	RESIGN	SIGN	GOTO
0542	REF	1			35,3134	03506 1		DELTEO	
0543	REF	2	LAST	665	35,3135	73145 0		STORELT	
0544					35,3136	57545 1	REVER5	DLOAD	DCOMP
0545	REF	2	LAST	670	35,3137	03606 1		DELTEO	
0546					35,3140	70406 1	PLSH	SRI	
0547	REF	3	LAST	670	35,3141	03606 1	STORE	DELTEO	
0548					35,3142	77615 0	CAC		
0549					35,3143	77650 1	GOTC		
0550	REF	1			35,3144	73146 0		ACTIME	
0551	REF	4	LAST	670	35,3145	03606 1	STORELT	STORE	DELTEO
0552					35,3146	77615 0	ACTIME	CAC	
0553	REF	6	LAST	662	35,3147	02317 0		NMTPI	SUM OF DELTA T:S
0554	REF	7	LAST	670	35,3150	02317 0		NMTPI	
0555					35,3151	63375 1	STORE	NMTPI	
0556	REF	2	LAST	667	35,3152	03506 1	VLCAD	PDVL	
0557	REF	2	LAST	667	35,3153	13500 1		VAPREC	
0558					35,3154	77624 1	CALL	RAPREC	
0559	REF	1			35,3155	72272 0		GCINT	
0560					35,3156	77624 1	CALL		
0561	REF	3	LAST	640	35,3157	46425 0		ACTIVE	STORE NEW RACT3 VACT3
0562					35,3160	62275 0	VLCAD	PDVL	
0563	REF	2	LAST	667	35,3161	03530 1		VPPREC	
0564	REF	2	LAST	667	35,3162	02522 1		RPPREC	
0565					35,3163	77624 1	CALL		
0566	REF	2	LAST	670	35,3164	73372 0		GCINT	
0567					35,3165	77624 1	CALL		
0568	REF	3	LAST	630	35,3166	46425 1		PASSIVE	STORE NEW RPASS3 VPASS3
0569					35,3167	77650 1		GOTC	
0570	REF	1			35,3170	72714 0		FLCALC	
0571					35,3171	43345 1	ELEX	DLOAD	DAD
0572	REF	18	LAST	663	35,3172	03636 1		TIFI	
0573	REF	8	LAST	670	35,3173	02317 0		NMTPI	
0574	REF	19	LAST	670	35,3174	17535 1		TIFI	
0575					35,3175	77614 1	STOOL		
0576	REF	5	LAST	662	35,3176	01310 1	BCN	ETPIFLAG	
0577	REF	2	LAST	668	35,3177	72201 0		TIMEX	
0578	REF	10	LAST	665	35,3200	02257 0	STORE	ELFV	
0579					35,3201	52145 1	DLOAD	GOTO	

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0581	FFF	R	LAST	661	35,3212	06524 1	ZEROVECS
0581	FFF	R	LAST	668	35,3213	03453 0	NORMEX

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P0582 S24/35.1

R0583 COMPLETE UNIT NORMAL AND LINE OF SIGHT VECTORS GIVEN THE ACTIVE AND

R0584 PASSIVE POS AND VEL AT TIME T3

0585					25,2204	52375 1	S24/35.1 VLCAE	VSL
0586	PEF	9	LAST	668	35,3205	03552 0		RPASS2
0587	PEF	14	LAST	668	35,3206	03536 1		RACT3
0588					35,32 7	41466 0	UNIT	PLSH
0589	PEF	4	LAST	667	35,3210	26311 0	STOVL	ULOS
0590	PEF	15	LAST	672	35,3211	02536 1		RACT3
0591					35,3212	53435 0	VXV	UNIT
0592	PEF	10	LAST	668	35,3213	03544 1		VACT3
0593	PEF	2	LAST	669	35,3214	02261 0	STOFF	UNRV
0594					35,3215	77616 1	RVQ	

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PD595 S34/35.2

R0596 ADVANCE PASSIVE VFF TO PDNMEZVCLS TIME AND GET PEG VEL FPCM LAMBERT

0597					35,3214	77220 1	S34/35.2 STQ	VLCAD		
0598	REF	16	LAST	661	35,3217	03470 1		SUBEXIT		
0599	REF	7	LAST	668	35,3220	03560 1		VFASS3		
0600					35,3221	65315 0		PDVL		
0601	REF	10	LAST	672	35,3222	03562 0		PFASS2		
0602	REF	3	LAST	666	35,3222	03610 0		INTIME		
0603					35,3224	65325 0		PDDL		
0604	REF	4	LAST	663	35,3225	03631 0		TFASS4		
0605	REF	5	LAST	669	35,3226	03641 1		TWCPI	CCNIC	
0606					35,3227	46125 0		PDDL		
06061	REF	6	LAST	661	35,3230	03467 1		BHIZ		
06062	REF	1			35,3231	72235 1		NN	S3435.23	
06063					35,3232	77745 1		ELCAD		
06064					35,3233	41545 0		ELCAD		
06065	REF	9	LAST	671	35,3234	06524 1		PUSH		
06066					35,3235	77624 1	S3435.23 CALL	ZEROVECS	PRECISION	
0607	REF	5	LAST	647	35,3236	73276 1		INTINT	GET TAFCEIT VECTOR	
0608	REF	4	LAST	199	35,3237	27444 0	S3435.25 STOVL	PTARG		
0609	REF	10	LAST	656	35,3240	00007 0		VATT		
0610	REF	2	LAST	663	35,3241	27506 1		VPASS4		
0611	REF	5	LAST	673	35,3242	03444 0		RTARG		
R0612	COMPUTE PFI = PT + (ACCS(UNIT RA, UNIT RP) - PI) SIGN(FA*RP, L)									
0613					35,3242	63256 0		UNIT	UNIT PP	
0614	REF	16	LAST	672	35,3244	03536 1		PACT3		
0615					35,3245	41456 0		UNIT	UNIT RA	
0616					35,3246	50235 0		VXV		
0617					35,3247	00001 0		OD		
0618	REF	4	LAST	672	35,3250	02261 0		UNRM	RA*RP, L	
0619					35,3251	77715 1		FCVL		
0620					35,3252	72441 0		CCY	UNIT RA, UNIT PP	
0621					35,3253	11001 0		OD		
0622					35,3254	75326 1		ACCS	SIGN	
0623					35,3255	43244 1		BPL	DAC	
0624	REF	1			35,3256	73260 1		NOPIE		
0625	REF	7	LAST	667	35,3257	06532 0		DPFCSMAX	REASONABLE TWO PI	
0626	REF	2	LAST	315	35,3260	15756 1	NOPIE	STOVL	ACTCENT	
0627	REF	5	LAST	673	35,3261	03631 0		TFASS4		
0628					35,3262	77625 0		ESL		
0629	REF	4	LAST	673	35,3263	03610 0		INTIME		
0630	REF	2	LAST	195	35,3264	03452 1		STORE	DFLLT4	
0631					35,3265	40325 0		SLCAD	SETPD	
0632	REF	7	LAST	673	35,3266	03467 1		NN	NUMBER OF OFFSETS	
0633					35,3267	00001 0		OD		
06331					35,3270	63325 0		PDDL	PDVL	
06332	REF	1			35,3271	33653 1		FFSCUR		
06333	REF	17	LAST	673	35,3272	03536 1		RACT3		
06334	REF	1			35,3273	26323 1		STOVL	RINIT	

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06225	REF	11	LAST	672	35,3274	3544	1		VACT3
06336	REF	1			35,3275	36331	0	STCALL	VINIT
06337	REF	1			35,3276	22100	1		INITVFL
0634					35,3277	77624	1	CALL	
0635	REF	1			35,3310	73357	1		LCMAT
0636					35,3301	64375	1	VLCAE	MXV
0637	REF	4	LAST	663	35,332	02366	0		DELVEPT3
0638					35,3313	0001	0		OC
0639					35,3304	77772	0	VSLI	
0640	REF	15	LAST	648	35,3315	37434	0	STCALL	DEIVLVC
0641	REF	17	LAST	673	35,3316	02470	1		SURFXIT

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P0642 S24/35.2

0643					35,3317	45321 1	S24/35.2 STG	CALL	
0644	PEF	9	LAST	671	35,3317	73463 0		NCRMEX	
0645	PEF	2	LAST	674	35,3311	72357 1		LCMAT	GET MATRIX IN PUSH LIST
0646					35,3312	61375 1		VLOAD	VXM
0647	PEF	16	LAST	674	35,3312	03434 1		DELVLVC	NEW DEL V TPI
0648					35,3314	00 1		DD	
0649					35,3315	77772 0		VSL1	
0650	PEF	5	LAST	674	35,3316	02366 0		STCRF	DELVEET3
0651					35,3317	63255 0		VAD	PDVL
0652	PEF	12	LAST	674	35,3320	03544 1			VACT3
0653	PEF	18	LAST	672	35,3321	02536 1			RACT3
0654					35,3322	65325 0		PDDL	PDDL
0655	PEF	16	LAST	666	35,3323	13442 0			TIC
0656	PEF	6	LAST	673	35,3324	12631 0			TPASS4
0657					35,3325	41525 0		PDDL	PUSH
0658	PEF	8	LAST	673	35,3326	06532 0			DPPCSMAX
0659					35,3327	77624 1		CALL	INTEC. FOR NEW TARGET VEC
0660	REF	6	LAST	673	35,3331	73376 1			INTINT
0661					35,3331	77775 1		VLCAC	
0662	REF	12	LAST	657	35,3332	00001 0			RATT
0663	PEF	6	LAST	673	35,3332	03444 1		STCRF	RTARG
0664					35,3334	41575 0	NEWPART	VLCAC	PLSH
0665	PEF	5	LAST	672	35,3335	02311 0			ULOS
0666					35,3336	57435 1		VXV	VCCMP
0667	REF	5	LAST	673	35,3337	02261 0			UNPM
0668					35,3340	41456 0		UNIT	PLSH
0669					35,3341	76435 1		VXV	VSL1
0670	PEF	6	LAST	675	35,3342	02311 0			ULOS
0671					35,3343	77715 1		PDVL	
0672					35,3344	64315 1		PDVL	MXV
0673	REF	6	LAST	675	35,3345	02366 0			DELVEET3
0674					35,3346	00001 0			DD
0675					35,3347	77772 0		VSL1	
0676	REF	4	LAST	316	35,3350	36303 1		STCALL	EVLOS
0677	PEF	10	LAST	675	35,3351	03462 0			NCRMEX

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P0678 S34/35.4

0679				35,3352	40220 0	S34/35.4 STQ	SFTPD	NO ASTROCALC OVERWRITE
0680	OFF	11	LAST	675	35,3353	03463 0	NCRMEX	
0681					35,3354	00001 0	UD	
0682					35,3355	77650 1	GOTC	
0683	OFF	1			35,3356	73334 1	NCVRWPT	

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P1684 LOMAT

0685				35,3357	57575 1	LOMAT	VLCAD	VCOMP	
0686	REF	6	LAST	675	35,3360			UNRM	
0687					25,3361		STOVL	6D	Y
0688	REF	19	LAST	675	35,3362			RACT3	
0689					25,3363		UNIT	VCOMP	
0690					35,3364		STOPE	12D	
0691					35,3365		VXV	VSL1	
0692	REF	7	LAST	677	35,3366			UNRM	Z*-Y
0693					35,3367		STORE	OD	
0694					35,3377		SETPC	PVC	
0695					25,3371			1PD	
0696					35,3372		GCINT	PDDL	DO
0697	REF	10	LAST	673	35,3372			ZEPOVECS	NCT
0698	REF	9	LAST	677	25,3374			NCMTPI	
0699					35,3375		PUSH	PUSH	
0700					25,3376		INTINT	CALL	ORDER OF INSERT BEFORE INTINT
0701	REF	4	LAST	653	35,3377			PTEN	
0702	REF	19	LAST	655	35,3407			INTSTALL	
0703					35,3411		CLEAR	ELCAD	
0704	REF	7	LAST	655	35,3412			INTYPEFLG	
0705					35,3413		BZE	SET	
0706					35,3414			+2	
0707	REF	8	LAST	677	35,3415			INTYPEFLG	
0708					35,3416		FLCAD	STADR	
0709	REF	27	LAST	666	35,3417		STCDL	TDEC1	
0710					35,3410		SET	LX*,2	
0711	REF	2	LAST	656	35,3411			MCENFLAC	
0712	REF	3	LAST	650	35,3412			RTX2	
0713					35,3412		PCN	CLEAR	
0714	REF	3	LAST	635	35,3414			MCENFLG	
0715	REF	1			35,3415			ALLSET	
0716	REF	4	LAST	677	25,3416			MCENFLAG	
0717	REF	6	LAST	656	35,3417		ALLSET	STOVL	
0718					25,3420			VSR*	
0719					35,3421			0,2	
0720	REF	6	LAST	656	35,3422		STOVL	RCV	
0721					35,3423		VSR*		
0722					35,3424			0,2	
0723	REF	5	LAST	656	35,3425		STCALL	VCV	
0724	REF	2	LAST	656	35,3426			INTEGRVS	
0725					35,3427		VLCAD	GOTO	
0726	REF	14	LAST	675	35,3430			PATT	
0727	REF	5	LAST	677	35,3431			RTPN	

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P0728 S24/35.5
 P0729 SUPPLEMENTALS USED

R0730 BANKCALL
 R0731 GCFFLASH
 R0732 GCTCPCOH
 R0733 S24/35.3
 R0734 S24/35.4
 R0735 VNFLOH

0736					35,3432	43020	1	S24/35.5	STG	BCN	
0737	REF	13	LAST	674	35,3432	03470	1			SUBEXIT	
0738	REF	4	LAST	631	35,3434	01311	0			FINALFLG	
0739	REF	1			35,3435	73441	1			FLAGCN	
0740					35,3436	5214	0		SET	GCTC	
0741	REF	9	LAST	632	35,3437	00470	1			UPDATEFLG	
0742	REF	1			35,3440	73505	0			FLAGOFF	
0743					35,3441	77214	0		FLAGON	CLEAR	VLCAD
0744	REF	1			35,3442	03274	0			NTARGFLG	
07441	REF	17	LAST	675	35,3442	02434	1			DELVLVC	
07442	REF	2	LAST	105	35,3444	01236	1		STORE	GDT/2	
07443					35,3445	77776	1			EXIT	
0745	REF	2	LAST	617	35,3446	22636	1	+5	CAF	VOENEL	
0746	REF	171	LAST	662	35,3447	04616	1		TC	BANKCALL	
0747	REF	14	LAST	662	35,3450	20477	1		CADR	GCFFLASH	
0748	REF	14	LAST	662	35,3451	06001	0		TC	GCTCPCOH	
0749					35,3452	03454	1		TC	+2	PRG
0750	REF	2	LAST	678	35,3453	03446	1		TC	FLAGON +5	LCAD
0751	REF	3	LAST	521	35,3454	35016	0	+2	CA	EBANK7	
07511	REF	15	LAST	522	35,3455	54003	0		TS	EBANK	TC BE SURE
07512					35,3456	22007	0		ZI		
07513	REF	14	LAST	611	35,3457	34754	1		CA	FIVE	
07514	REF	186	LAST	611	35,3460	54002	1	NTARGCHK	TS	Q	
07515	REF	187	LAST	678	35,3461	52002	0		INDEX	Q	
07516	REF	18	LAST	678	35,3462	41433	0		CS	DELVLVC	
07517	REF	189	LAST	678	35,3463	50002	0		INDEX	Q	
07518	REF	3	LAST	678	35,3464	61225	1		AD	GDT/2	
07519	REF	96	LAST	615	35,3465	26001	1		ACS	L	
0752	REF	189	LAST	678	35,3466	10002	1		CCS	Q	
07521	REF	1			35,3467	13461	1		TCF	NTARGCHK	
07522	REF	217	LAST	615	35,3470	22000	1		LXCH	A	
07523					35,3471	00000	1		EXTEND		
07524					35,3472	13475	1		EZF	+3	
07525	REF	41	LAST	632	35,3473	05504	0		TC	UPFLAC	
0753	REF	2	LAST	678	35,3474	00146	1		ADRES	NTARGFLG	
0754	REF	77	LAST	666	35,3475	06042	1		TC	INTPRET	
0755					35,3476	45014	0		BOFF	CALL	
0756	REF	3	LAST	678	35,3477	03354	1			NTARGFLG	

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0757	REF	1		35,351	72512 1		NOCHG
0758	REF	1		35,351	73317 1		S24/35.3
0759	*			35,3512	77775 1	NOCHG	VLCAD
0761	REF	7	LAST	675	35,353	02366 0	DELVECT3
0762	REF	9	LAST	648	35,3514	03456 1	STORE DELVSIN
0763					35,3505	77624 1	FLAGCEFF CALL
0764	REF	1			35,3516	73352 1	S24/35.4
0765					35,3507	77776 1	EXIT
0766	REF	1			35,351	33635 1	CAF VC6N55
0767	REF	13	LAST	663	35,3511	03621 1	TC VNPOOH
0768	REF	78	LAST	678	35,3512	06042 1	TC INTERPT
0769					35,3513	77651 1	GOTC
0771	REF	19	LAST	678	35,3514	03470 1	SUPEXIT

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P0771 VN1645

P0772 SUPERLINES USED

P0773 P3XCRP7X
 P0774 CET+MGA
 P0775 BANKCALL
 P0776 DELAYJOB
 P0777 CMPTGO
 P0778 GCFLASFF
 P0779 COTOPPOH
 P0780 FLAGUP

0781					35,3515	71220 1	VN1645	STO	DLCAD	
0782	REF	20	LAST	675	35,3516	03470 1			SUBEXIT	
0783	REF	1			35,3517	23451 0			DF-.C1	
0784	REF	3	LAST	617	35,3520	02253 1		STORE	+MGA	MGA = -.C1
0785					35,3521	71214 0		BCFF	DLCAD	
0786	REF	5	LAST	678	35,3522	01351 1			FINALFLG	
0787	REF	1			35,3523	73543 1			CET45	
0788	REF	2	LAST	680	35,3524	33651 0			DF-.C1	
0789					35,3525	77415 0		EAC		
0790	REF	2	LAST	680	35,3526	33651 0			DF-.D1	
0791	REF	4	LAST	680	35,3527	02253 1		STORE	+MGA	MGA = -.C2
0792					35,3530	77414 0		BOFF	EXIT	
0793	REF	1			35,3531	01742 1			PEFSMFLG	
0794	REF	2	LAST	680	35,3532	73543 1			GET45	
0795	REF	1			35,3533	03613 0		TC	P3XCRP7X	
0796					35,3534	03626 0		TC	+2	F3X
0797	REF	3	LAST	680	35,3535	13544 1		TC	GET45 +1	F7X
0798	REF	79	LAST	675	35,3536	01742 1		TC	INTPRET	
0799					35,3537	41575 0		VLCAD	PLSH	
0800	REF	10	LAST	675	35,3540	03655 1			DELVSIN	
0801					35,3541	77624 1		CALL		COMPUTE MGA
0802	REF	1			35,3542	15725 0			GET+MGA	
0803					35,3543	77776 1	GET45	EXIT		
0804	REF	1			35,3544	2437 0		TC	CMPTGO	INITIATE TASK TO UPDATE TIOGC
0805	REF	21	LAST	680	35,3545	21470 0		CA	SUBEXIT	
0806	REF	1			35,3546	551464 1		TS	QSAVFC	
0807	REF	6	LAST	607	35,3547	34777 1		CAF	ISEC	
0808	REF	172	LAST	678	35,3550	04616 1		TC	BANKCALL	
0809	REF	9	LAST	518	35,3551	01736 1		CADR	DELAYJOB	
0810	REF	1			35,3552	34627 0		CAF	V16N45	TERMINATE, TIOGC, +MGA
0811	REF	173	LAST	680	35,3553	04616 1		TC	BANKCALL	
0812	REF	15	LAST	678	35,3554	20477 1		CADR	GCFLASFF	
0813	REF	1			35,3555	03660 1		TC	KILCLOCK	TERMINATE
0814	REF	1			35,3556	03663 1		TC	N45PRCC	PROCEED
0815	REF	1			35,3557	03673 0		TC	CLUPDATE	RECYCLE - RETURN FOR INITIAL COMPUTATION
0816	REF	13	LAST	432	35,3560	20005 1	KILCLOCK	CA	Z	
0817	REF	3	LAST	653	35,3561	551162 1		TS	DISPDEX	

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0819	REF	15	LAST	678	35,3562	0 6001 0	TC	GCTCPCH	
0819	REF	17	LAST	677	35,3562	4 0076 1	N45PRCC	CS	FLAGW02
0821	REF	40	LAST	562	35,3564	7 4746 1		MASK	BIT6
0821					35,3565	0 0016 1		EXTEND	
0822	REF	2	LAST	680	35,3566	1 3561 0		PZF	KILCLOCK
0823	REF	25	LAST	521	35,3567	0 5253 1		TC	PHASCHNG
0824					35,3570	14 024 0		CCT	04024
0825	REF	42	LAST	678	35,3571	0 5504 0		TC	UFFLAG
0826	REF	6	LAST	690	35,3572	10 0147 1		ADRES	FINALFLG
0827	REF	14	LAST	680	35,3573	3 0015 1	CLUPEATE	CA	Z
0828	REF	4	LAST	687	35,3574	55 0162 1		TS	DISPFX
0829	REF	26	LAST	681	35,3575	0 5253 1		TC	PHASCHNG
0831					35,3576	14 024 0		CCT	04024
0831	REF	80	LAST	680	35,3577	0 6042 1		TC	INTERFT
0832					35,3600	52 0114 0		CLEAR	GCT0
0833	REF	10	LAST	678	35,3601	0 0070 0			UPDATEFLG
0834	REF	2	LAST	690	35,3602	03464 1			QSAVFD

FINAL FLG IS SET-FLASH V37-AWAIT NEW PGM

SET
FINALFLG

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P0835 DISPLAY
P0836 SLPROLINES USEDR0837 PANKCALL
P0838 GCFLASH
R0839 GCTOPPOH
R0840 FLANKET
R0841 ENDCEJRE

0842					25,3602	0	0.6	1	DISPLAY EXTEND		
0843	REF	12	LAST	676	25,3604	23	463	1	QXCH	NCFMEX	
0844	REF	2	LAST	625	25,3605	2	3633	1	CAF	VCCN55	
0845	REF	174	LAST	680	25,3606	0	4616	1	TCR	PANKCALL	
0846	REF	16	LAST	680	25,3607	2	1477	1	CACR	GCFLASH	
0847	REF	16	LAST	681	25,3610	1	6001	1	TCF	GCTOPPOH	
0848	REF	13	LAST	682	25,3611	0	1463	1	TC	NCFMEX	
0849					25,3612	1	3605	1	TCF	-5	

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P0853 P3XCRP7X

0854	RFF	2	LAST	246	35,2612	2 7747 1	P3XCRP7X	CAF	HIGH9
0855	RFF	12	LAST	499	35,2614	7 1010 0		MASK	MCOREC
0856					35,2615	0 0016 1		EXTEND	
0857					35,2616	1 2620 1		RZF	+2
0858	RFF	150	LAST	678	35,2617	24 0 2 0		INCR	0
0859					35,2620	0 0002 0		RTLRN	

R0860 VNPDCH

R0861 SUBROUTINES USED

R0862 PANKCALL
 P0863 GCFLASH
 R0864 GCTOPDOH

0865					35,2621	0 00 6 1	VNPDCH	EXTEND	
0866	RFF	8	LAST	677	35,2622	23 465 1		GXCF	RTOR
0867	RFF	3	LAST	683	35,2623	55 615 0		TS	VERBNCUN
0868	RFF	4	LAST	683	35,2624	3 1615 1		CA	VERBNCUN
0869	RFF	175	LAST	682	35,2625	0 4615 1		TCR	PANKCALL
0870	RFF	17	LAST	682	35,2626	20 477 1		CADP	GCFLASH
0871	RFF	17	LAST	682	35,2627	1 6001 1		TCF	GCTOPDOH
0872	RFF	7	LAST	682	35,2630	0 1465 1		TC	RTFN
0873					35,2631	1 3624 0		TCF	-5

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P0874 CONSTANTS

0875	35,2632	01445 0	V06N37	VN	0637	
0876	35,2633	01467 0	V06N55	VN	0655	
0877	35,2634	01472 1	V06N58	VN	0658	
0878	35,2635	01473 0	V06N59	VN	0659	
0879	35,2636	01521 0	V06N81	VN	0681	
0880	35,2637	04055 0	V16N45	VN	1645	
0881	35,2640	14441 0	TWCPI	2DEC	6.283185307	E-4
0881	35,2641	27225 1				
0882	35,2642	00001 0	MAX250	2DEC	25 E3	
0882	35,2643	20650 0				
0883	35,2644	12525 0	THIRD	2DEC	.333333333	
0883	35,2645	12525 0				
0884	35,2646	00004 0	ELEPS	2DEC	.277777777	E-3
0884	35,2647	21505 1				
0886	35,2650	77777 0	EF-.01	CCT	77777	CONSTANTS
0887	35,2651	61227 1		CCT	61337	ADJACENT
						-.01 FOR MEA DSP
08871	35,2652	01252 0	EPSFOUR	2DEC	.0416666666	
08871	35,2653	25253 1				
08872	35,2654	13434 0	130DEC	2DEC	.3611111111	
08872	35,2655	16162 0				

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P0888 INITVEL

R0889 MCC NO -1 LCC SECTION - P34-P35, P74-P75

R0890 MCC BY WHITE.P DATE 21NOV67

R0891 FUNCTIONAL DESCRIPTION

R0892 THIS SUBROUTINE COMPUTES THE REQUIRED INITIAL VELOCITY VECTOR FOR
 R0893 A TRAJECTORY OF SPECIFIED TRANSFER TIME BETWEEN SPECIFIED INITIAL
 R0894 AND TARGET POSITIONS. THE TRAJECTORY MAY BE EITHER CONIC OR
 R0895 PRECISION DEPENDENT ON AN INPUT PARAMETER (NAMELY, NUMBER OF
 R0896 OFFSETS). IN ADDITION, IN THE PRECISION TRAJECTORY CASE, THE
 R0897 SUBROUTINE ALSO COMPUTES AN OFFSET TARGET VECTOR, TO BE USED
 R0898 DURING PURE-CONIC CROSS-PRODUCT STEERING. THE OFFSET TARGET
 R0899 VECTOR IS THE TERMINAL POSITION VECTOR OF A CONIC TRAJECTORY WHICH
 R0900 HAS THE SAME INITIAL STATE AS A PRECISION TRAJECTORY WHOSE
 R0901 TERMINAL POSITION VECTOR IS THE SPECIFIED TARGET VECTOR.

R0902 IN ORDER TO AVOID THE INHERENT SINGULARITIES IN THE 180 DEGREE
 R0903 TRANSFER CASE WHEN THE (TRUE OR OFFSET) TARGET VECTOR MAY BE
 R0904 SLIGHTLY OUT OF THE ORBITAL PLANE, THIS SUBROUTINE ROTATES THIS
 R0905 VECTOR INTO A PLANE DEFINED BY THE INPUT INITIAL POSITION VECTOR
 R0906 AND ANOTHER INPUT VECTOR (USUALLY THE INITIAL VELOCITY VECTOR),
 R0907 WHENEVER THE INPUT TARGET VECTOR LIES INSIDE A CONE WHOSE VERTEX
 R0908 IS THE ORIGIN OF COORDINATES, WHOSE AXIS IS THE 180 DEGREE
 R0909 TRANSFER DIRECTION, AND WHOSE CONE ANGLE IS SPECIFIED BY THE USER.

R0910 THE LAMBERT SUBROUTINE IS UTILIZED FOR THE CONIC COMPUTATIONS AND
 R0911 THE COASTING INTEGRATION SUBROUTINE IS UTILIZED FOR THE PRECISION
 R0912 TRAJECTORY COMPUTATIONS.

R0913 CALLING SEQUENCE

R0914 L CALL
 R0915 L+1 INITVEL
 R0916 L+2 (RETURN - ALWAYS)

R0917 INPLT

R0918 (1) RINIT INITIAL POSITION RADIUS VECTOR
 R0919 (2) VINIT INITIAL POSITION VELOCITY VECTOR
 R0920 (3) RTARG TARGET POSITION RADIUS VECTOR
 R0921 (4) DELT4 DESIRED TIME OF FLIGHT FROM RINIT TO RTARG
 R0922 (5) INTIME TIME OF RINIT
 R0923 (6) ID NUMBER OF ITERATIONS OF LAMBERT/INTEGRALS
 R0924 (7) ZC ANGLE TO 180 DEGREES WHEN ROTATION STARTS
 R0925 (8) RTX1 -2 FOR EARTH, -100 FOR LUNAR
 R09251 (9) RTX2 COORDINATE SYSTEM ORIGIN - 0 FOR EARTH, 2 FOR LUNAR
 R0926 FLSHLOC SFT AT 40

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R0927 OUTPUT

R0928 (1) RTAPG OFFSET TARGET POSITION VECTOR
 R0929 (2) VTPRIME MANEUVER VELOCITY REQUIRED
 R0930 (3) VTPRIME VELOCITY AT TARGET AFTER MANEUVER
 R0931 (4) DELVETB3 DELTA VELOCITY REQUIRED FOR MANEUVER

R0932 SUPROUTINES USED

R0933 LAMPERT
 R0934 INSTALI
 R0935 INTEGRVS

C936 PFF 1 11,2000 SFTLOC INTVEL
 C937 11,2000 BANK

R0938 PFF 1 11,2000 77614 1 INITVEL COUNT* \$\$/INITV
 C938 11,2000 77614 1 INITVEL SFT COGA GUESS NOT AVAILABLE
 R0959 PFF 1 11,2001 00475 1 GLESSW
 R0960 11,2002 44175 1 HAVEGUES VLCAD STC
 C961 PFF 7 LAST 675 11,2003 03444 0 RTARG
 R0962 PFF 14 LAST 682 11,2004 03462 0 ACPMEX
 C963 PFF 1 11,2005 03472 0 STORE RTARG1
 C9631 11,2006 77646 0 ARVAL
 R09632 PFF 2 LAST 144 11,2007 03723 1 STCRF RTMAG
 C964 11,2008 46135 1 SLOCAD BPHZ
 R0965 PFF 4 LAST 677 11,2011 02000 1 RTX2
 R0967 PFF 1 11,2012 22026 0 INITVEL1
 C968 11,2013 72575 0 VLCAD VSL2
 R0969 PFF 2 LAST 673 11,2014 02323 1 FINIT P29
 C970 PFF 3 LAST 686 11,2015 26323 1 STOVL RINIT P27
 C971 PFF 2 LAST 674 11,2016 02331 1 VINIT P7
 C972 11,2017 77752 1 VSL2
 C973 PFF 3 LAST 686 11,2020 26331 1 STOVL VINIT P5
 R0974 PFF 2 LAST 686 11,2021 03472 0 RTAPG1
 C975 11,2022 77752 1 VSL2
 R0976 PFF 3 LAST 686 11,2023 03472 0 STCRF RTARG1
 C9761 11,2024 77646 0 ARVAL
 C9762 PFF 3 LAST 686 11,2025 03723 1 STORE RTMAG

R0977 INITIALIZATION

R0978 11,2026 71331 0 INITVEL1 SSP DLOAD SFT ITCTF TC -1, LOAD MPAC WITH E4 (PL 2E)
 C979 PFF 1 11,2027 03617 1 ITCTF
 R0980 11,203 77776 1 0 -1
 R0981 11,2031 77546 1 COSINE SP1 CALCULATE COSINE (F4) (+2)
 R0982 PFF 1 11,2032 17667 0 STCCL CCZY4 SFT COZY4 TO COSINE(E4) (PL 0C)
 R0983 11,2033 67154 0 LXA,2 SX4,2
 C984 PFF 288 LAST 669 11,2034 07154 1 MPAC
 R0985 PFF 2 LAST 126 11,2035 02701 0 VTAPCTAG SFT VTAPCTAG TO 0C (SP)
 C986 11,2036 77775 1 VLCAD

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0987	PEF	4	LAST	686	11,2037	02223 1	RINIT		
0988	REF	3	LAST	126	11,2040	26655 1	STCVL	R1VEC	R1VEC EQ RINIT
0989	REF	4	LAST	686	11,2041	03472 0		RTARG1	
0990	REF	2	LAST	126	11,2042	16663 0	STCDL	R2VEC	R2VEC EQ RTARG
0991	PEF	4	LAST	673	11,2043	03452 1		DELLT4	
0992	REF	2	LAST	126	11,2044	02671 0	STORE	TECSIPED	TECSIPED EQ DELLT4
0993					11,2045	77201 1	SETPC	VLCAD	
0994					11,2046	02001 0		SD	INITIALIZE PL TO CD
0995	REF	5	LAST	687	11,2047	02222 1		PINIT	MFAC EQ RINIT (+29)
0996					11,2050	41456 0	UNIT	PLSH	UNIT(R1) (+1) (PL 6C)
0997					11,2051	53435 0	VXV	UNIT	
0998	PEF	4	LAST	686	11,2052	02331 1		VINIT	MFAC EQ UNIT(R1) x VI (+8)
0999	REF	2	LAST	126	11,2053	26674 0	STCVL	UN	
1000	REF	5	LAST	687	11,2054	03472 0		RTARG1	
1001					11,2055	50256 0	UNIT	DCT	TENF=LFT,UR1 (+2) (PL 6C)
1002					11,2056	43015 1	CAD	CLFAP	
1003	REF	2	LAST	686	11,2057	03467 0		CCZY4	
1004	PEF	1			11,2061	02665 1		NCRMSW	
1005	REF	3	LAST	687	11,2061	03667 0	STORE	CCZY4	
1006					11,2062	03044 0	INITVEL2	SET	
1007	PEF	1			11,2063	221 5 0		INITVEL3	UN CALCULATED IN LAMBERT
1008	REF	2	LAST	687	11,2064	03465 0		NCRMSW	
ROTATE RC INTO YC PLANE - SET UNIT NORMAL TO YC									
1010					11,2065	41575 0	VLOAD	PLSH	(PL 6C)
1011	PEF	3	LAST	687	11,2066	02663 0		R2VEC	RC TO 6C (+29)
1012					11,2067	63246 1	AEVAL	PDVL	RC TO MFAC, AEVAL(PC) (+29) TO 9C (PL 2C)
1013					11,2070	46206 1	PUSH	VPECH	(PL 8C)
1014	PEF	3	LAST	687	11,2071	02674 0		UN	
1015					11,2072	51352 1	VSL2	BVSU	
1016					11,2073	74256 1	UNIT	VXSC	(PL 6C)
1017					11,2074	77772 0	VSL1		
1018	REF	4	LAST	687	11,2075	02663 0	STORE	R2VEC	
1019					11,2076	67351 1	TLCAD	SLCAD	
1020	REF	2	LAST	37	11,2077	24007 0		ZF90VFC	
1021	REF	2	LAST	686	11,2100	03617 1		ITCTR	
1022					11,2101	77244 0	BFL	VLCAD	
1023	REF	2	LAST	687	11,2102	22175 0		INITVEL3	
1024	REF	5	LAST	687	11,2103	02663 0		R2VEC	
1025	REF	6	LAST	687	11,2104	03472 0	STCPF	RTARG1	
1026					11,2105	63345 0	INITVEL3	PDVL	(PL 2C)
1027	REF	1			11,2106	26007 1		MLEAPTH	POSITIVE VALUE
1028	REF	6	LAST	687	11,2107	02663 0		R2VEC	
1028C2					11,2110	63254 0	UNIT	PDVL	2D = UNIT(R2VEC) (PL 8C)
1028C4	REF	4	LAST	687	11,2111	02655 0		R1VEC	
1028C6					11,2112	41454 0	UNIT	PLSH	8D = UNIT(R1VEC) (PL 14C)
1028C8					11,2113	57435 1	VXV	VCCMP	-N = UNIT(R2VEC) x UNIT(R1VEC)
1028I					11,2114	00003 1		2C	
1028J					11,2115	77606 1	PUSH		(PL 20C)
1028K					11,2116	71350 1	LXA,1	CLEAD	

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10284	REF	6	LAST	662	11,2117	02776 0		RTX1	
10285					11,2120	00023 0		180	
10286					11,2121	62747 1	BMN	1ACR,1	
10287					11,2122	22124 0		+2	
10288					11,2123	77767 1	CFC	-8	
10289					11,2124	67310 1	1ACR,1	SLCAD	
10290					11,2125	00012 1		100	
10291	REF	14	LAST	665	11,2126	00047 1		X1	
10292					11,2127	77230 0	EFIZ	VLOAD	(PL14C)
10293					11,2128	22132 1		+2	
10294					11,2131	41476 1	VCOMP	PLSH	(PL20C)
10295					11,2132	77775 1	VLOAD		(PL14C)
10296					11,2133	50235 0	VXV	DFT	(PL 2C)
1030					11,2134	71244 0	RPL	DLCAD	(PL 0C)
1033	REF	1			11,2135	22137 1		INITVEL4	
1034					11,2136	41476 1	VCOMP	PLSH	(PL 2C)
1035					11,2137	67154 1	INITVEL4	LXA,2	
1036					11,2140	00001 1		0C	
1037	REF	2	LAST	126	11,2141	02672 0		GEOMSGN	
R1038									
1039					11,2142	66250 1	LXA,1	SSP	
1040	REF	7	LAST	688	11,2143	02776 0		RTX1	
10401	REF	1			11,2144	00027 1		ITERCTR	
10412					11,2145	00024 1		200	
R1041									
1042					11,2146	77624 1	CALL		
1043	REF	1			11,2147	25212 1		LAMBERT	
R1044									
1045					11,2150	77214 0	CLEAR	VLOAD	
1046	REF	2	LAST	686	11,2151	00675 0		GUESSW	
1047	REF	8	LAST	663	11,2152	02744 1		VVEC	
R1048									
R1049									
1050	REF	2	LAST	663	11,2153	14337 1	STOOL	VIPRIME	INITIAL VELOCITY REQUIRED (+7)
R1051									
R1052									
R1053									
1054	REF	3	LAST	656	11,2154	02712 0		VIARTAG	
1055					11,2155	45730 0	EFIZ	CALL	
1056	REF	1			11,2156	22232 0		INITVEL7	
1057	REF	20	LAST	677	11,2157	27412 0		INTSTALL	
1061					11,2161	43135 1	SLCAD	CLEAR	
1062	REF	5	LAST	686	11,2161	03000 1		RTX2	
1063	REF	5	LAST	677	11,2162	02263 0		MCONFLAG	
1064					11,2163	43030 0	EFIZ	SET	

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1065	REF	1		11,2164	22166	1	INITVEL5		
1066	REF	6	LAST	688	11,2165	00063	1	NOINFLAG	
1067				11,2166	77775	1	INITVEL5	VLCAD	
1068	REF	6	LAST	687	11,2167	02323	1	PINIT	
1069	REF	5	LAST	687	11,2171	25555	1	STORE	P1VEC
1070	REF	7	LAST	677	11,2171	25535	1	STOVL	RCV
1071	REF	3	LAST	688	11,2172	02337	1		VIPRIME
1072	REF	6	LAST	677	11,2173	15543	1	STOVL	VCV
1073	REF	5	LAST	673	11,2174	03611	1		INTIME
1074	REF	7	LAST	677	11,2175	01517	1	STORE	TFT
1075				11,2176	43.15	1	DAD	CLEAR	
1076	REF	5	LAST	687	11,2177	03452	1		DELLT4
1077	REF	9	LAST	677	11,2200	01677	1		INTYFFLG
1078	REF	20	LAST	677	11,2201	34.41	1	STCALL	TCHC1
1079	REF	2	LAST	677	11,2202	27110	1		INTEGRVS
1080				11,2203	77775	1	VLCAD		
1081	REF	2	LAST	656	11,2204	01025	1		VATTI
1082	REF	2	LAST	126	11,2205	02703	1	STORE	VTARGET
R1083	IF ITERATION COUNTER (ITCTR) EQ NO. ITERATIONS (NUMIT), CONTINUE AT								
R1084	INITVELC, OTHERWISE REITERATE LAMBERT AND ENCKE								
1085				11,2206	63154	1	LXA,2	INCP,2	
1086	REF	3	LAST	687	11,2207	03616	1		ITCTR
1087				11,2210	00001	1		IC	
1088				11,2211	55124	1	SXA,2	XSL,2	
1089	REF	4	LAST	689	11,2212	03616	1		ITCTR
1090	REF	4	LAST	688	11,2213	02701	1		VTARGET
1091				11,2214	46135	1	SLCAD	RHIZ	
1092	REF	5	LAST	656	11,2215	00050	1		X2
1093	REF	1		11,2216	22230	1		INITVEL6	
R1094									
R1095	OFFSET CONIC TARGET VECTOR								
1096				11,2217	52375	1	VLCAD	VSL	
1097	REF	7	LAST	687	11,2220	03472	1		RTARG1
1098	REF	5	LAST	656	11,2221	00017	1		RATT1
1099				11,2222	77655	1	VAD		
1100	REF	7	LAST	687	11,2223	02663	1		R2VEC
1101	REF	8	LAST	689	11,2224	16663	1	STOVL	R2VEC
1102	REF	4	LAST	687	11,2225	03667	1		CC7Y4
1103				11,2226	77651	1	GCTC		
1104	REF	1		11,2227	22062	1		INITVEL2	
R1105	COMPUTE THE DELTA VELOCITY								
1106				11,223	77775	1	INITVEL6	VLCAD	
1107	REF	9	LAST	689	11,2231	02663	1		R2VEC
1108	REF	8	LAST	689	11,2232	03472	1	STORE	RTARG1
1109				11,2233	52375	1	INITVEL7	VLCAD	
1110	REF	4	LAST	689	11,2234	02337	1		VIPRIME
1111	REF	6	LAST	687	11,2235	02331	1		VINIT

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1112	FFF	8	LAST	679	11,2236	26366	1	STOVL	DELVEET3	DELVEET3 = VIPRIME-VINIT (+7)
1113	FFF	3	LAST	685	11,2237	02703	1		VTARGET	
1114	REF	2	LAST	663	11,224	03566	1	STORE	VTPRIME	
1115					11,2241	46135	1	SLDAD	BFIZ	
1116	FFF	6	LAST	688	11,2242	03000	1		RTX2	
1117	FFF	1			11,2242	22263	0		INITVFLX	
11171					11,2244	70575	1	VICAD	VSR2	
11172	FFF	2	LAST	690	11,2245	03566	1		VTPRIME	
1118	FFF	4	LAST	690	11,2246	27566	1	STOVL	VTPRIME	
1119	FFF	5	LAST	685	11,2247	02337	1		VTPRIME	
1120					11,2250	77742	0	VSR2		
1121	FFF	6	LAST	690	11,2251	26337	1	STOVL	VIPRIME	
1122	REF	5	LAST	685	11,2252	03472	0		PTAPG1	
1123					11,2253	77742	0	VSR2		
1124	REF	10	LAST	690	11,2254	27472	0	STOVL	RTAPG1	
1125	FFF	9	LAST	690	11,2255	02366	0		DELVEET3	
1126					11,2256	77742	0	VSR2		
1127	FFF	10	LAST	690	11,2257	02366	0	STCPE	DELVEET3	
1128					11,2267	70750	1	INITVFLX	LXA,1	
11281	FFF	8	LAST	688	11,2261	02776	0		DLCAD*	
11282	FFF	1			11,2262	10030	0		RTX1	
112825					11,2263	41276	0		MLTABLE -2,1	
11283	FFF	3	LAST	651	11,2264	02742	1	PUSH	DMP	
11284					11,2265	56342	1	SRI	RIA	
11285	FFF	4	LAST	651	11,2266	00441	1		CCV	
11286	FFF	2	LAST	144	11,2267	17721	0		RI	
11287					11,2270	77661	0	STOVL	MU/A	
112871					11,2271	20607	1	SP		
11287F	FFF	2	LAST	144	11,2272	02717	0		6	
11288					11,2273	77231	1	STCPE	MUASTEER	
1128					11,2274	00391	0	SETPD	VLCAD	
1130	FFF	11	LAST	690	11,2275	03472	0		DD	
1131	*FFF	8	LAST	686	11,2276	03444	0		RTAPG1	
1132	*				11,2277	52014	0	STORE	RTARG	
1133	*FFF	3	LAST	645	11,2280	01267	0	CLEAR	GOTO	
1134	REF	15	LAST	686	11,2301	03462	0		XCELVFLG	
R1135									NORMEX	
R1136 END OF INITVFL ROUTINE									

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P1137. MIOGIM

R1138 MFC NO. 0, BY WILLMAN, SUBROUTINE PENGUIN, LCG P34-P35, P74-P75

R1139 REVISION 03, 17 FEB 67

R1140 IF THE ACTIVE VEHICLE IS DOING THE COMPUTATION, MIOGIM COMPLETES

R1141 THE POSITIVE MIDDLE CIRCULAR ANGLE OF THE ACTIVE VEHICLE TO THE INPUT

R1142 DELTA VELOCITY VECTOR (IT IN PUSH LIST), OTHERWISE

R1143 MIOGIM CONVERTS THE INPUT DELTA VELOCITY VECTOR FROM INERTIAL COORDIN-

R1144 ATES TO LOCAL VERTICAL COORDINATES OF THE ACTIVE VEHICLE.

R1145 .. INPUTS ..

R1146 NAME MEANING UNITS/SCALING/MODE

P1147 AVELAG INT FLAG - 0 IS CSM ACTIVE, 1 IS LEM ACTIVE EIT

P1149 RINIT ACTIVE VEHICLE RADIUS VECTOR. METERS/CSEC (+7) VI

R1150 VINIT ACTIVE VEHICLE VELOCITY VECTOR METERS/CSEC (+7) VI

P1151 ID (PL) ACTIVE VEHICLE DELTA VELOCITY VECTOR METERS/CSEC (+7) VI

R1152 .. OUTPUTS ..

P1153 NAME MEANING UNITS/SCALING/MODE

R1154 +MCA + MIDDLE CIRCULAR ANGLE REVOLUTIONS (+7) DP

R1156 DELVLVC DELTA VELOCITY VECTOR IN LV COORD. METERS/CSEC (+7) VT

P1156 MDELVLVC INT FLAG - 0 IS +MCA COMPUTED, 1 IS DELVLVC COMP. - EIT

R1157 .. CALLING SEQUENCE ..

R1158 L CALL

R1159 L+1 MIOGIM

R1160 L+2 (RETURN - ALWAYS)

P1161 .. NO SUBROUTINES CALLED ..

P1162 .. PARTS - REASEABLE TEMPORARY USAGE

P1163 A,G,L, PUSH LIST, MEAC.

R1164 .. ALARMS - NONE ..

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P1165 MIDDLE GIMBAL ANGLE COMPUTATION.

1166	REF	1		06,2196			SFTLCC MIDDGIM	
1167				06,3723			RANK	
1168	REF	1					CLCNT* \$1/M1EG	
1169				06,3723	2000	HALFREY	2DEC	I P-1
1170				06,3724	0000			
1171				06,3725	53575	GET+MCA	VLCAD	UNIT
1172				06,3726	77656		UNIT	
1173				06,3727	72441		ECT	SL1
1174	REF	10	LAST	595	06,3730			REFSMAT +6
1175					06,3731		ARCSIN	BPL
1176	REF	1			06,3732			SFTMCA
1177					06,3733		DAD	DAU
1178					06,3734			HALFREY
1179	REF	1			06,3735			HALFREY
1180					06,3736			
1181	REF	1			06,3737		SFTMCA	STORE
1182					06,3738		CLR	PVC
1183	REF	2	LAST	692	06,3739			MGLVFLAG
1184					06,3740			
1185	REF	1			06,3741		GET.LVC	VLCAD
1186					06,3742			UNIT
1187					06,3743			PIKIT
1188					06,3744		VCOMP	
1189					06,3745		STORE	180
1190					06,3746		VXV	UNIT
1191	REF	6	LAST	689	06,3747			VINIT
1192					06,3748			
1193					06,3749		STORE	120
1194					06,3750		VXV	UNIT
1195					06,3751			180
1196					06,3752		STORE	60
1197					06,3753			60
1198					06,3754		MXV	VSL1
1199					06,3755			60
1200	REF	19	LAST	678	06,3756		STORE	DELVLVC
1201					06,3757		SFT	PVC
1202					06,3758			MGLVFLAG
1203	REF	2	LAST	692	06,3759			
1204					06,3760			
1205					06,3761			
1206					06,3762			
1207					06,3763			

R1207 END OF MIDDGIM ROUTINE

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P1236 PERIAPD

R1237 MCD NO -1 LCC SECTION - P34-P35, P74-P75

R1238 MCD BY WHITE.P DATE 1P/JAN68

R1239 FUNCTIONAL DESCRIPTION

R1240 THIS SUBROUTINE COMPUTES THE TWO BODY APCENTER AND PERICENTER
 R1241 ALTITUDES GIVEN THE POSITION AND VELOCITY VECTORS FOR A POINT ON
 R1242 THE TRAJECTORY AND THE PRIMARY BODY.

R1243 SETRAD IS CALLED TO DETERMINE THE RADIUS OF THE PRIMARY BODY.

R1244 APSIDS IS CALLED TO SOLVE FOR THE TWO BODY RADII OF APCENTER AND
 R1245 PERICENTER AND THE ECCENTRICITY OF THE TRAJECTORY.

R1246 CALLING SEQUENCE

R1247 L CALL
 R1248 L+1 PERIAPD
 R1249 L+2 (FETURN - ALWAYS)

R1250 INPUT

R1251 (1) PVFC POSITION VECTOR IN METERS
 R1252 SCALE FACTOR - EARTH +29, MOON +27
 R1253 (2) VVEC VELOCITY VECTOR IN METERS/CENTISECOND
 R1254 SCALE FACTOR - EARTH +7, MOON +5
 R1255 (3) X1 PRIMARY BODY INDICATOR
 R1256 EARTH -2, MOON -1)

R1257 OUTPUT

R1258 (1) 2D APCENTER RADIUS IN METERS
 R1259 SCALE FACTOR - EARTH +29, MOON +27
 R1260 (2) 4D APCENTER ALTITUDE IN METERS
 R1261 SCALE FACTOR - EARTH +29, MOON +27
 R1262 (3) 6D PERICENTER RADIUS IN METERS
 R1263 SCALE FACTOR - EARTH +29, MOON +27
 R1264 (4) 8D PERICENTER ALTITUDE IN METERS
 R1265 SCALE FACTOR - EARTH +29, MOON +27
 R1266 (5) ECC ECCENTRICITY OF CONIC TRAJECTORY
 R1267 SCALE FACTOR - +3
 R1268 (6) XXXALT RADIUS OF THE PRIMARY BODY IN METERS
 R1269 SCALE FACTOR - EARTH +29, MOON +27
 R1270 (7) PUSHLCC EQUALS 100

R1271 SUBROUTINES USED

R1272 SETRAD

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R1273 APSIDES

1274 REF 1 23,2337 SETLOC APPROX

1275 23,2337 BANK

1276 REF 1 COUNT* 11/PERAP

1277 23,2337 01302 0 PPAC 2DEC 6373228 B-25 STANDARD RADIUS OF PAD 37-B.

1277 23,2340 17755 0

A1274 = 20 509 901.57 FT

1279 23,2341 53754 1 PERIAPD1 LXA,2 VSP*

1280 REF 2 LAST 693 23,2342 02777 1 RTX2

1281 23,2343 57176 0 C,2

1282 REF 5 LAST 698 23,2344 25744 1 STCVL VVEC

1283 23,2345 53750 0 LXA,1 VSP*

1284 REF 11 LAST 693 23,2346 02776 0 PTX1

1285 23,2347 57176 0 C,2

1286 REF 7 LAST 662 23,2350 02655 0 STORE RVCC

1287 23,2351 45120 1 PERIAPD STQ CALL

1288 REF 16 LAST 690 23,2352 03463 0 NORMEX

1289 REF 1 23,2353 46367 1 SETRAF

1290 REF 2 LAST 143 23,2354 37671 0 STCALL XXXALT

1291 REF 1 23,2355 25704 0 APSIDES

1292 23,2356 41411 1 SETPD PLSH

1293 23,2357 03013 1 2D

1294 23,2360 65225 1 DSL PDDL

1295 REF 3 LAST 695 23,2361 03671 1 XXXALT

1296 23,2362 00001 0 0C

1297 23,2363 45246 1 PUSH DSU

1298 REF 4 LAST 695 23,2364 03671 1 XXXALT

1299 23,2365 52006 0 FLUSH GCTC

1300 REF 17 LAST 695 23,2366 03463 0 NORMEX

2D = APCENTER RADIUS B29 CR B27

4D = APCOE ALTITUDE B29 CR B27

6D = PERICENTER RADIUS B29 CR B27

8E = PERICOE ALTITUDE B29 CR B27

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1301	SETRAD								
1302				23,2367	41545 0	SETRAD	ELCAD	PLSH	
1303	REF	1		23,2370	06340 0			PPAD	
1304				23,2371	63120 0		EXA,1	INCR,2	
1305	REF	10	LAST	695	23,2372	00047 1		X2	
1306				23,2373	00012 0			2D	
1307				23,2374	46135 1		SLCAD	PHIZ	
1308	REF	11	LAST	696	23,2375	00151 1		X2	
1309	REF	1			23,2376	46402 0		SETFADX	
1310				23,2377	51575 1		VLCAD	APVAL	
1311	REF	3	LAST	201	23,2400	02023 1		PLS	
1312				23,2401	77725 1		PDDL		
1313				23,2402	43545 1	SETRADX	ELCAD	PVC	

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E7 S3

P1314	PRESET				22,2403	77620	PRESET	STO	
1315					23,2404	03463 0			NORMEX
1316	REF	13	LAST	695	23,2405	27574 0		STCALL	TDEC2
1317	REF	2	LAST	625	23,2406	27574 0			LEMSTORE
1318	REF	4	LAST	619	23,2407	77624 1		CALL	
1319					23,2408	46421 1			LEMSTORE
1320	REF	1			23,2409	77745 1		DLAD	
1321					23,2410	03574 1			TDEC2
1322	REF	2	LAST	697	23,2411	34441 0		STCALL	TDEC1
1323	REF	29	LAST	689	23,2412	27544 1			CSMSTORE
1324	REF	3	LAST	208	23,2413	77624 1		CALL	
1325					23,2414	46421 0			CSMSTORE
1326	REF	1			23,2415	77657 1		GCTC	
1327					23,2416	03463 0			NORMEX
1328	REF	19	LAST	697	23,2417	43175 0	LEMSTORE	VLAD	BCFF
1329					23,2418	00001 0			PATT
1330	REF	15	LAST	677	23,2419	01252 1			AVFLAG
1331	REF	3	LAST	632	23,2420	46435 1			PASSIVE
1332	REF	4	LAST	670	23,2421	27536 1	ACTIVE	STCVL	RACT3
1333	REF	20	LAST	677	23,2422	00007 0			VATT
1334	REF	11	LAST	673	23,2423	03544 1		STORE	VACT3
1335	REF	12	LAST	675	23,2424	77616 0		PVC	
1336					23,2425	43175 0	CSMSTORE	VLAD	BCFF
1337					23,2426	00001 0			PATT
1338	REF	16	LAST	697	23,2427	01252 1			AVFLAG
1339	REF	4	LAST	697	23,2428	46425 0			ACTIVE
1340	REF	4	LAST	671	23,2429	27552 0	PASSIVE	STCVL	RPASS3
1341	REF	11	LAST	672	23,2430	00007 0			VATT
1342	REF	12	LAST	697	23,2431	03563 1		STORE	VPASS2
1343	REF	8	LAST	673	23,2432	77616 0		PVC	
1344					23,2433				

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P1345	VFCSHIFT								
1346				23,2441	53754 1	VFCSHIFT LXA,2	VSP*		
1347	REF	S	LAST	695	23,2442	02777 1	RTX2		
1348					23,2443	57176 C		0,2	
1349					23,2444	63350 1	LXA,1	PDVL	
1350	REF	11	LAST	695	23,2445	02776 C		PTX1	
1351					23,2446	62257 1	VSR*	PDVL	
1352					23,2447	57176 C		0,2	
1353					23,2448	77616 C	RVC		

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P1354	SHIFT01						
1355		23,2451	52754 1	SHIFT01	LX4,2	SL*	
1356	REF 10 LAST 658	23,2452	02777 1			RTX2	
1357		23,2453	57576 1			0,2	
1358		23,2454	77616 0			RVQ	

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R1360 PROGRAM DESCRIPTION
 R1360 SUBROUTINE NAME P36 CUT-OF-PLANE RENDEZVOUS ROUTINE
 R1361 MODE NO. 0 DATE 22 DECEMBER 67
 R1362 MOD BY N.M. NEVILLE LCR SECTION EXTENDED VFRES
 R1363 FUNCTIONAL DESCRIPTION

R1364 TO DISPLAY AT ASTRONAUT REQUEST LCC CALCULATED RENDEZVOUS
 R1365 CUT-OF-PLANE PARAMETERS (Y, YDOT, PSI). (REQUESTED BY DSKY).

R1366 CALLING SEQUENCE

R1367 ASTRONAUT REQUEST THROUGH DSKY V 90 E

R1368 SUBROUTINES CALLED

R1369 EXDSPEC
 R1370 COMAPKE
 R1371 CSMPREC
 R1372 LEMPREC
 R1373 SGNAOPRE
 R1374 LCACTINF

R1375 NORMAL EXIT MODES

R1376 ASTRONAUT REQUEST THROUGH DSKY TO TERMINATE PROGRAM V 34 E

R1377 ALARM OR ABORT EXIT MODES

R1378 NONE

R1379 OUTPLT

R1380 DECIMAL DISPLAY OF TIME, Y, YDOT AND PSI

R1381 DISPLAYED VALUES Y, YDOT, AND PSI, ARE STORED IN FRASABLE
 R1382 REGISTERS RANGE, FRATE AND ETHETA RESPECTIVELY.

R1383 FRASABLE INITIALIZATION R CLIPED

R1384 CSM AND LEM STATE VECTORS

R1385 DERPIS

R1386 CENTRALS A,G,I

R1387 OTHER THOSE USED BY THE ABOVE LISTED SUBROUTINES

1388		20,2115	BANK 20
1389	REF 1	4,250	STILCC P36LM
1390		4,264	BANK

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1391	REF	3	LAST	285	04,1676		EBANK= RP/SS36	
1392	REF	1					CRUNT# 11/P36	
1393					04,2641	22 7 0 R26	ZL	
1394	REF	127	LAST	654	04,2641	3 4755 1	CAF	ZEPO
1395	REF	6	LAST	306	04,2642	521051 0	CXCF	DSPTMX
1396	REF	1			04,2643	2 2772 1	CAF	VCAN16N
1397	REF	175	LAST	583	04,2644	1 4616 1	TC	RANKCALL
1398	REF	9	LAST	270	04,2645	27334 1	CADP	GCMARKF
1399	REF	36	LAST	612	04,2646	1 5472 1	TCF	FNDEXI
1400					04,2647	1 2651 0	TCF	+2
1401					04,2650	1 2643 1	TCF	-5
1402	REF	7	LAST	701	04,2651	531051 0	CXCF	DSPTMX
1403					04,2652	0 0106 1	EXTEND	
1404	REF	1			04,2652	1 2762 1	BZF	LRGCHK
1405	REF	289	LAST	686	04,2654	52 155 1	CXCF	MPAC
1406	REF	81	LAST	681	04,2655	0 6042 1	TC	INTERPT
1407					04,2656	77634 0	FTP	
1408	REF	1			04,2657	21717 0		DEMCCE
1409	REF	3	LAST	657	04,2660	24741 0	STCALL	TCIC1
1410	REF	1			04,2661	27044 1		OTHPPEC
1411					04,2662	63275 1	VLCAC	PDVL
1412	REF	13	LAST	697	04,2662	70717 1	VATT	
1413	REF	17	LAST	657	04,2664	01011 1	RATT	
1414	REF	4	LAST	701	04,2665	62217 0	STORE	PFASS35
1415					04,2666	63256 0	UNIT	PDVL
1416					04,2667	53435 0	VXV	UNIT
1417					04,2670	77625 0	STADP	
1418	REF	1			04,2671	61562 1	STOCL	UNP36
1419	REF	9	LAST	657	04,2672	71015 0	TAT	
1420	REF	31	LAST	701	04,2672	24041 0	STCALL	TOLC1
1421	REF	1			04,2674	27061 1		THISPREC
1422					04,2675	63275 0	VLCAC	PDVL
1423	REF	14	LAST	701	04,2676	70717 0	VATT	
1424	REF	18	LAST	701	04,2677	01011 1	RATT	
1425					04,2700	77725 1	FDCL	
1426	REF	1	LAST	701	04,2701	11015 0	TAT	
1427					04,2702	24037 1	STOVL	300
1428					04,2703	41406 0	PLSH	PLSH
1429					04,2714	63245 1	PVSU	PDVL
1430	REF	5	LAST	701	04,2705	02207 0		RFASS36
1431					04,2706	72441 1	DCT	SL1
1432	REF	2	LAST	701	04,2717	02215 0		UNP36
1433	REF	9	LAST	318	04,2710	26211 0	STOVL	RANGE
1434					04,2711	01011 0		CRD
1435					04,2712	72441 0	DCT	SL1
1436	REF	3	LAST	701	04,2713	02215 0		UNP36
1437	REF	5	LAST	318	04,2714	26213 1	STOVL	RRATE
1438					04,2715	00007 0		060

SET TIME OF EVENT TO ZERO FOR FIRST
DISPLAYTERMINATE
PROCEED

RECYCLE FOR ASTRONAUT INPUT TIME

A-REG ZERO COTC CHECK L-REG FOR ZERO
A-REG NON-ZERO, TIME = ASTRC INPUT TIMEVELCCITY VECTOR V
A 000

SAVE TIME IN LOCATION 300 FOR REDISPLAY

POSITION VECTOR P IN 060 AND 120
A - -
LINE OF SIGHT VECTOR R - P 120
P AY = U . P
AY = U . V
A -

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1430				4,2716	41456 0	UNIT	PUSH	U = UNIT(F)	180
1440				4,2717	47235 0	VXV	VXV	RA A	
1441				4,2720	00001 0		QCD	- - - -	
1442				4,2721	00023 0		180	(L XV)XL =L	
1443				4,2722	53552 0	VSL2	UNIT	RA A RA A	
144305				4,2723	77656 1	UNIT			
1444				4,2724	24701 0	STOVL	QND	UNIT HORIZONTAL IN FORWARD DIR. QCD	
1445				4,2725	00023 0		180		
1446				4,2726	74241 0	DCT	VXSC	-	
1447				4,2727	00015 0		120	U	
1448				4,2730	77752 1	VSL2		L	
1449				4,2731	53445 1	BVSU	UNIT		
144905				4,2732	77656 1	UNIT			
1450				4,2733	50206 0	PUSH	DCT	LCS PROJECTED INTO HORIZONTAL PLANE	120
1451				4,2734	00001 0		QCD		
1452				4,2735	65552 0	SLI	ARCCCS	- -	
1453	REF	5	LAST	318	4,2736	26205 1	STOVL	PIHETA	PSI= ARCCCS(L .U)
1454					4,2737	50235 0	DCT	A L	
1455					4,2740	00001 0		QND	
1456					4,2741	71244 0	BPL	DLCAD	
1457	REF	1			4,2742	11747 1		R36TAG2	
1458	REF	2	LAST	27	4,2743	24020 0		LEDPMAX	
1459					4,2744	77625 0	DSU		
1460	REF	6	LAST	702	4,2745	02205 1		PIHETA	
1461	REF	7	LAST	702	4,2746	02205 1	STORE	PIHETA	
1462					4,2747	47145 1	P36TAG2	DLCAD	RTB
1463					4,2750	00027 0		300	
1464	REF	2	LAST	377	4,2751	21613 0		SGMAGFE	
1465	REF	8	LAST	701	4,2752	01051 1	STORE	DSPTFMX	
1466					4,2753	77776 1	EXIT		
1467	REF	1			4,2754	02774 1	CAF	VCANSON	DISPLAY Y , YCCT , AND PSI
1468	REF	177	LAST	701	4,2755	04616 1	TC	BANKCALL	
1469	REF	10	LAST	701	4,2756	00234 1	CADR	GCMAKKE	
1470	REF	37	LAST	701	4,2757	105472 1	TCF	ENEXT	TERMINATE
1471	REF	38	LAST	702	4,2760	105472 1	TCF	ENEXT	PPCCFE, END OF PROGRAM
1472	REF	2	LAST	285	4,2761	102643 0	TCF	R36 +3	REDISPLAY CLIPUT
1473	REF	97	LAST	678	4,2762	56001 0	LPFGCHK	XCF	L
1474					4,2763	00006 1	EXTEND		
1475	REF	1			4,2764	102767 1	BZF	ENTIM2	L-REG ZERO, SET TIME = PRESENT TIME
1476	REF	9P	LAST	702	4,2765	56001 0	XCF	L	L-REG NON ZERO, TIME = ASTRO INPLT TIME
1477	REF	1			4,2766	102654 0	TCF	ASTPTIM	
1478	REF	82	LAST	701	4,2767	00042 1	ENTIM2	TC	INTPRET
1479					4,2770	52034 1	RTB	GCTC	
1480	REF	15	LAST	666	4,2771	21574 1		LCADTIME	
1481	REF	1			4,2772	10660 0		R36INT	
1492					4,2773	01420 0	VCAN16N	VN	00616
14F3					4,2774	01532 1	VCANSON	VII	00690

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0084	REF	19	LAST	701	37,3212	1001	RAT	
0085	REF	7	LAST	341	37,3213	26207	RCNF	
0086	REF	15	LAST	701	37,3214	00007	VATT	
0087	REF	1			37,3215	36215	1	STCALL
0088	REF	22	LAST	704	37,3216	27412	1	VCNE
0089					27,3217	71214	0	INTSTALL
0090	REF	11	LAST	704	37,3220	01473	0	CLCAD
0091	REF	12	LAST	704	37,3221	00015	0	INTYPELG
0092	REF	25	LAST	704	37,3222	00041	1	TAT
0093					37,3223	43175	0	CTHINT
0094	REF	2	LAST	704	37,3224	02140	0	STERE
0095	REF	0	LAST	704	37,3225	00262	0	VLOAD
0096	REF	9	LAST	704	37,3226	25535	0	CLCAR
0097	REF	2	LAST	704	37,3227	02120	0	BASECTP
0098	REF	8	LAST	704	37,3230	15563	1	MCNFLAG
0099	REF	3	LAST	704	37,3231	02114	1	STOVL
0100					37,3232	43014	0	RCV
0101	REF	3	LAST	704	37,3233	04344	0	BASECTV
0102					37,3234	77234	0	VCV
0103	REF	11	LAST	705	37,3235	00000	1	STCDL
0104	REF	0	LAST	704	37,3236	35517	1	BCF
0105	REF	5	LAST	704	37,3237	27110	1	SET
0106					37,3240	52375	1	MOONTHIS
0107	REF	20	LAST	705	37,3241	10001	0	+2
0108	REF	8	LAST	705	37,3242	02207	0	MCNFLAG
0109					37,3243	65234	1	TET
0110	REF	2	LAST	585	37,3244	21725	1	STCALL
0111					37,3245	00045	0	INTEGVS
0112					37,3246	77557	0	VSL
0113					37,3247	20201	0	RAT
0114	REF	10	LAST	701	37,3250	26201	0	RCNF
0115	REF	16	LAST	705	37,3251	00007	0	PEDL
0116					37,3252	50251	1	NORMUNX1
0117	REF	2	LAST	705	37,3253	02215	0	360
0118					37,3254	77752	1	UNIT(RANGE) TO PD 0-5
0119	REF	6	LAST	701	37,3255	26203	1	RESCALE AFTER NORMUNIT
0120	REF	9	LAST	705	37,3256	02217	0	0,1
0121					37,3257	63256	0	SCALED 2(25)M
0122	REF	6	LAST	584	37,3260	06516	0	(VCN- VLN).UNIT(LES), PC=0
0123					37,3261	77524	1	VCNE
0124	REF	1			37,3262	47662	1	SL1
0125					37,3263	41505	1	STOVL
0126	REF	17	LAST	692	37,3264	01734	0	RATF
0127					37,3265	72421	1	RCNF
0128					37,3266	00001	0	PEDL
0129					37,3267	53445	1	NORMUNX1
0130					37,3270	00017	0	360
0131					37,3271	47315	0	UNIT(R) TO PD 0-5
0132					37,3272	00001	0	UNIT(2)/4 TO PD 6-11
0133	REF	3	LAST	705	37,3273	02215	0	UNIT(F)=UNIT(U2-(U2)PRCJ(UR))

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0134				37,3274	50235 0	VXV	00T	(UR # VL)*UR . U(P)
0135				37,3275	10001 0		00	
0136				37,3276	00015 0		120	
0137				37,3277	77715 1	PDVL		SIGN TC 12-13 , LCAC U(P)
0138				37,3300	75241 1	DOT	SIGN	
0139				37,3301	00007 0		60	
0140				37,3302	00015 0		120	
0141				37,3303	65512 1	SL2	ACCS	ARCCOS(UP.UZ(SIGN))
0142	REF	8	LAST	702	37,3304	STCVL	RTHETA	
0143				37,3305	00001 0		00	
0144				37,3306	51041 0	DOT	BFL	IF UP.UZ NEG,
0145				37,3307	00007 0		60	RTHETA = 1 - RTHETA
0146				37,3310	77315 0		+5	
0147				37,3311	45245 1	CLFAC	DSU	
0148	REF	9	LAST	675	37,3312		DPCCSMAX	
0149	REF	5	LAST	706	37,3313		RTHETA	
0150	REF	10	LAST	706	37,3314	STORE	RTHETA	
0151				37,3315	77776 1	EXIT		
0152	REF	30	LAST	616	37,3316	CA	RITS	
0153	REF	11	LAST	703	37,3317	MASK	EXTV3ACT	
0154				37,3320	00006 1	EXTEND		IF ANSWERED,
0155	REF	29	LAST	702	37,3321	RZF	ENDEXT	TERMINATE
0156	REF	12	LAST	706	37,3322	CS	EXTV3ACT	
0157	REF	25	LAST	703	37,3323	MASK	RIT12	
0158	REF	13	LAST	706	37,3324	ADS	EXTV3ACT	SET BIT 12
0159	REF	1			37,3325	TCF	REV83	AND START AGAIN.
0160								
0161	REF	2	LAST	536	37,3326	GETRVN	CA	PRIC22
0162	REF	10	LAST	498	37,3327		TC	PRIOCHNG
0163	REF	85	LAST	704	37,3330		TC	INTERPRET
0164				37,3331	40375 1	VLGAD	SETPD	
0165	REF	5	LAST	321	37,3332		RN	LM STATE VECTOR IN RN,VN
0166				37,3333	00001 0		0	
0167	REF	10	LAST	705	37,3334	STCVL	RCNE	
0168	REF	5	LAST	321	37,3335		VN	
0169	REF	4	LAST	705	37,3336	STCVL	VCNE	LCAC R(CSM),V(CSM) IN CASE MUNFLAG SET
0170	REF	2	LAST	601	37,3337		V(CSM)	(TO INSURE TIME COMPATABILITY)
0171				37,3340	55315 0	PEVL	PCPL	
0172	REF	2	LAST	601	37,3341		R(CSM)	
0173	REF	5	LAST	600	37,3342		PIPTIME	
0174				37,3343	77776 1	EXIT		
0175	REF	10	LAST	703	37,3344	CA	PRIC3	
0176	REF	11	LAST	706	37,3345	TC	PRIOCHNG	
0177	REF	86	LAST	706	37,3346	TC	INTERPRET	
0178				37,3347	77214 0	BOFF	VLGAD	
0179	REF	2	LAST	230	37,3350		MUNFLAG	
0180	REF	1			37,3351	GETRVN2		IF MUNFLAG RESET, DO CM DELTA PRECISION

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0180				37,3352	60515	1	VXM	VSP4	CHANGE TO REFERENCE SYSTEM AND RESCALE
0181	REF	18	LAST	705	37,3352	11724		REFSMAT	
0182				37,3354	77715	1	PEVL		R TO PD C-5
0183				37,3355	76505	0	VXM	VSL1	
0184	REF	19	LAST	707	37,3356	11724		REFSMAT	
0185				37,3357	41215	1	PUSH	SETPD	V TO PD 5-11
0186				37,3360	6001	0			
0187				37,3361	77650	1	GOTC		
0188	REF	1		37,3362	77240	1		CCMPCISP	

0189				37,3363	77624	1	GETRVN2	CALL	
0190	REF	23	LAST	705	37,3364	27412		INTSTALL	
0191				37,3365	52014	0	CLEAR	GCTC	
0192	REF	12	LAST	705	37,3366	11673	1	INTYPFLG	PREC EXTRAP FOR CTRP
0193	REF	1		37,3367	77222	0		CTHINT	
0194	REF	37	LAST	706	37,337	0 6042	1	P31SLRF	TC
0195				37,3371	77634	0	RTB	INTERPT	
0196	REF	18	LAST	704	37,3372	21574	1	LCADTIME	LM IS ON SURFACE, SC PRECISION
0197	REF	26	LAST	705	37,3373	34041	0	STCALL	INTEGRATION USES PLANETARY INERTIAL
0198	REF	6	LAST	704	37,3374	27161	1	TCFCL	ORIENTATION SUBROUTINE
0199				37,3375	77650	1	LEMPROC		
0200	REF	1		37,3376	77211	0	GCTC	CC CSM CCNIC	
0201	REF	2	LAST	187	37,3377	4 7112	1	CS	CTHCCNIC
0202	REF	2	LAST	187	37,34	7 4744	0	FLAGWRD6	
0203				37,341	0 0706	1	MASK	MUNFLIT	
0204	REF	2	LAST	704	37,3412	1 3326	1	EXTEND	
							PZF	GETFVN	IF MUNFLAG SET, CSM BASE NOT NEEDED

0205	REF	38	LAST	707	37,3413	1 6042	1	ONBASE	TC	INTPRFT	EFT CSM BASE VECTOR
0206					37,3414	52734	1		PTR	GCTC	
0207	REF	19	LAST	707	37,3415	21574	1			LCADTIME	
0208	REF	1			37,3416	77144	0			DCMBASE	
0209					37,3417	04 63	0	V16N54	VN	1654	

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USFPA'S PAGE NO. 1 EC S3

R5000 1) PROGRAM NAME - TARGET DELTA V PROGRAM (P76).
 R5001 2) FUNCTIONAL DESCRIPTION - MAIN ENTRY BY ASTRONAUT ACTION, P76 FLASHES DSKY REQUESTS TO THE ASTRONAUT
 R5003 TO PROVIDE VIA DSKY (1) THE DELTA V TO BE APPLIED TO THE OTHER VEHICLE STATE VECTOR AND (2) THE
 R5005 TIME (TIG) AT WHICH THE OTHER VEHICLE VELOCITY WAS CHANGED BY EXECUTION OF A THRUSTING MANEUVER. THE
 R5007 OTHER VEHICLE STATE VECTOR IS INTEGRATED TO TIG AND UPDATED BY THE ADDITION OF DELTA V (DELTA V HAVING
 R5009 BEEN TRANSFORMED FROM LV TO REF CCSYS). USING INTEGRVS, THE PROGRAM THEN INTEGRATES THE OTHER
 R5011 VEHICLE STATE VECTOR TO THE STATE VECTOR OF THIS VEHICLE, THUS INSURING THAT THE W-MATRIX AND BOTH VEHICLE
 R5013 STATES CORRESPOND TO THE SAME TIME.
 R5014 3) ERASABLE INITIALIZATION REQUIRED - NONE.
 R5015 4) CALLING SEQUENCES AND EXIT MODES - CALLED BY ASTRONAUT REQUEST THRU DSKY V 27 E 76 E.
 R5017 EXITS BY TCF ENDPROC.
 R5018 5) OUTPUT - OTHER VEHICLE STATE VECTOR INTEGRATED TO TIG AND INCREMENTED BY DELTA V IN REF CCSYS.
 R5020 THE PUSHLIST CONTAINS THE MATRIX BY WHICH THE INPUT DELTA V MUST BE POST-MULTIPLIED TO CONVERT FROM LV
 R5022 TO REF CCSYS.
 R5023 6) INPUTS - OTHER VEHICLE STATE VECTOR.
 R5024 7) SUBROUTINES CALLED - BANKCALL, GCDSPF, CSMPREF (OR LEMPREF), ATOPCSM (OR ATOPLEM), INTSTALL, INTWAKE, PASCNG
 R5026 INTERPT, INTEGRVS, AND MINIRECT.

R5027 8) FLAG USE - MCONFLAG, CMCONFLAG, INTYPELG, PASFLAG, AND MARKCTR.

5028					30,261				BANK 30
5029	REF	1			13,2000				SETLOC P76LOC
5030					13,2207				BANK

5031	REF	1							CCLNT# 55/P76
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5032	REF	17	LAST	675	57,1441				FRANK= TIG
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5033	REF	43	LAST	691	13,2207	C 5504 C	P76	TC	UPFLAG
5034	REF	6	LAST	692	13,2210	00031 C		ADRES	TRACKFLG

50341	REF	85	LAST	707	13,2211	0 6742 1		TC	INTPFET
50342					13,2212	77775 1		VLCAD	
50343	REF	20	LAST	692	13,2213	03434 1			DFLVLCV
50344	REF	4	LAST	317	13,2214	02223 0		STORE	DELVCV
50345					13,2215	77776 1		EXIT	

5035	*REF	1			13,2216	3 2337 1		CAF	V06N84 +1	FLASH VFRB 06 NOUN 33, DISPLAY LAST TIG,
5040	REF	179	LAST	700	13,2217	0 4616 1		TC	BANKCALL	AND WAIT FOR KEYBOARD ACTION.

5041	REF	18	LAST	682	13,2220	20477 1		CADR	GCFLASH	
5042	REF	1			13,2221	1 2333 1		TCF	ENDP76	

5043					13,2222	C 2224 1		TC	+2	PROCEED
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5044					13,2223	0 2216 0		TC	-5	STORE DATA AND REPEAT FLASHING
5045	*REF	2	LAST	700	13,2224	3 2336 0		CAF	V06N84	FLASH LAST DELTA V,
5046	REF	131	LAST	709	13,2225	0 4616 1		TC	BANKCALL	AND WAIT FOR KEYBOARD ACTION.

5047	REF	19	LAST	709	13,2226	20477 1		CADR	GCFLASH	
5048	REF	2	LAST	709	13,2227	1 2333 1		TCF	ENDP76	

5049					13,2230	0 2222 0		TC	+2	
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5050					13,2231	C 2224 1		TC	-5	
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5051	REF	51	LAST	709	13,2232	C 6042 1		TC	INTPRET	RETURN TO INTERPRETIVE CODE
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5052					13,2233	77745 1	CLCAP	SET E(MPAC)=TIG IN CSEC R2R
5053	REF	18	LAST	709	13,2234	12442 0		TIG
5054	REF	37	LAST	707	13,2235	34341 0	STCALL	TDIC1 SET IDECI=TIG FOR ORBITAL INTEGRATION
5055	REF	2	LAST	701	13,2236	27044 1		CTEPRFC
5056					13,2237	53575 0	COMPMAT	VLOAD UNIT
5057	REF	21	LAST	705	13,2238	00001 0		RATT
5058					13,2241	77676 0	VCOMP	U(-R)
5059					13,2242	00031 0	STORE	240 U(-R) TO 240
5060					13,2243	52435 0	VXV	UNIT U(-R)XV = L(VXR)
5061	REF	17	LAST	705	13,2244	00007 0		VATT
5062					13,2245	00023 0	STORE	180
5063					13,2246	53435 0	VXV	UNIT U(VXP)XU(-R) = U(PXV)XR
5064					13,2247	00031 0		240
5065					13,2250	24115 0	STCVL	120
5066	REF	5	LAST	709	13,2251	02223 0		DELVCV
5067					13,2252	76505 0	VXM	VCL1
5068					13,2253	00015 0		120
5069					13,2254	77655 1	VAC	
5070	REF	18	LAST	710	13,2255	00017 0		VATT
5071					13,2256	00007 0	STORE	6
5072					13,2257	77624 1	CALL	V(PC6)=VATT + DELTA V
5073	REF	24	LAST	707	13,2260	27412 0		INTSTALL
5074					13,2261	77624 1	CALL	INTG FROM INTERFERING WITH UPDATING
5075	REF	1			13,2262	26344 1		P76SLB1
5076					13,2263	53775 1	VLCAT	VSR#
5077					13,2264	00007 0		6
5078					13,2265	57176 0		0,2
5079	REF	9	LAST	705	13,2266	25543 1	STCVL	VCV
5080	REF	22	LAST	710	13,2267	00001 0		RATT
5081					13,2270	77657 0	VSR#	
5082					13,2271	57176 0		0,2
5083	REF	10	LAST	705	13,2272	15535 0	STCVL	RCV
5084	REF	19	LAST	710	13,2273	03442 0		TIG
5085	REF	10	LAST	705	13,2274	01517 0	STORE	TFT
5086					13,2275	71214 0	CLCAP	DLLOAD
5087	REF	13	LAST	707	13,2276	01673 1		INTYFELC
5088	REF	1			13,2277	01643 1		TFTTHIS
5089	REF	38	LAST	710	13,2310	34341 0	INTOTHS STCALL	TDIC1
5090	REF	6	LAST	705	13,2301	27110 1		INTEGRVS
5091					13,2302	77624 1	CALL	
5092	REF	25	LAST	710	13,2303	27412 0		INTSTALL
5093					13,2304	77775 1	VLCAD	
5094	REF	8	LAST	704	13,2305	00017 1		RATT1
5095	REF	3	LAST	497	13,2306	01513 0	STORE	RREFCT
5096	REF	11	LAST	710	13,2307	15535 0	STCVL	RCV
5097	REF	13	LAST	705	13,2310	00115 0		TAT
5098	REF	11	LAST	710	13,2311	25517 0	STCVL	TET
5099	REF	11	LAST	704	13,2312	00025 0		VATT1
5100					13,2313	77674 1	CALL	
5101	REF	2	LAST	497	13,2314	27707 1		MINIRECT

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L .R30

LSEF'S PAGE NO. 1 EQ S3

R0001 SUBROUTINE NAME: V82CALL
 R0002 MOD NO: 0
 R0004 MOD BY: PD BATESSEATHER
 R0006 MOD NO: 1 MOD BY: RR BATESSEATHER
 R0008 MOD NO: 2 MOD BY: ALONSO
 R0010 MOD NO: 3 MOD BY: ALCASE
 R0012 NEW FUNCTIONAL DESCRIPTION: CALLED BY VERB 82 ENTER. PRIORITY 10
 R0013 USED THROUGHOUT. CALCULATE AND DISPLAY CRITICAL PARAMETERS

DATE: 16 FEB 67
 LOG SECTION: P30

SP30.1 CHANGED TO ALLOW MONITOR OPERA
 V82 PROGRAM REWRITTEN
 PRGM MOD TO HANDLE DIF EARTH/MCCN SCALE

R0014 1. IF AVERAGE G IS OFF:
 R0015 FLASH DISPLAY VC4NC6. R2 INDICATES WHICH SHIP'S STATE VECTOR IS
 R0016 TO BE UPDATED. INITIAL CHOICE IS THIS SHIP (R2=1). ASTRONAUT
 R0017 CAN CHANGE TO OTHER SHIP BY V22EXE, WHERE X NOT EQ 1.
 R0018 SELECTED STATE VECTOR UPDATED BY THISPRFC (CTHPRFC).
 R0019 CALLS SR30.1 (WHICH CALLS TFFCONMU + TFFP/PA) TO CALCULATE
 R0020 RPER (PERIGEE RADIUS), PAPC (APOGEE RADIUS), HPER (PERIGEE
 R0021 HEIGHT ABOVE LAUNCH PAD OR LUNAR LANDING SITE), HAPC (APOGEE
 R0022 HEIGHT AS ABOVE), TPER (TIME TO PERIGEE), TFF (TIME TO
 R0023 INTERSECT 301 KFT ABOVE PAD OR 35KFT ABOVE LANDING SITE).
 R0024 FLASH MONITOR V16N44 (HAPC, HPER, TFF). TFF IS -59M59S IF IT WAS
 R0025 NOT COMPUTABLE, OTHERWISE IT INCREMENTS ONCE PER SECOND.
 R1126 ASTRONAUT HAS OPTION TO MONITOR TPER BY KEYING IN N 32 E.
 R1127 DISPLAY IS IN HRS, IS NEGATIVE (AS WAS TFF), AND INCREMENTS
 R1128 ONCE PER SECOND ONLY IF TFF DISPLAY WAS -59M59S.

R1129 2. IF AVERAGE G IS ON:
 R1130 CALLS SR30.1 APPROX EVERY TWO SECS. STATE VECTOR IS ALWAYS
 R1131 FOR THIS VEHICLE. V82 DOES NOT DISTURB STATE VECTOR. RESULTS
 R1132 OF SR30.1 ARE PAPC, RPER, HAPC, HPER, TPER, TFF.
 R1133 FLASH MONITOR V16N44 (HAPC, HPER, TFF).
 R1134 APPENDUM: HAPC AND HPER SHOULD BE CHANGED TO READ HAPCX AND HPERX IN THE
 R1135 ABOVE REMARKS.

R1138 CALLING SEQUENCE: VERB 82 ENTER.

R1139 SUBROUTINE CALLED: SR30.1, GXXCSPE
 R1140 MAYR - THISPRFC, CTHPRFC, LCACTIVE, DELRSPL
 R1141 NORMAL EXIT MODES: TO END XT

R1142 ALARMS: NONE

R1143 OUTPUT: HAPCX (-29) M
 R1144 HPERX (-29) M
 R1145 PAPC (-29) M EARTH
 R1146 (-27) M MCCN
 R1147 RPER (-29) M EARTH
 R1148 (-27) M MCCN
 R1149 TFF (-28) CS CONTAINS NEGATIVE QUANTITY
 R1150 -TPER (-28) CS CONTAINS NEGATIVE QUANTITY

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R0051

R0052 FRASAEF INITIALIZATION REQUIRED: STATE VECTOR.

R0053 CLEPIS: QPDET, RCMF, VONE, TFF/PTMU, HPERMIN, PPACTEM, V82EMFLG.

R0054 MAYBE: TSTART92, V82FLAGS, IDECL.

0055	REF	3	LAST	315	F4,1517				FRANK= HAPDX		
0056					31,2144				BANK 31		
0057	REF	2	LAST	44	22,2000				SETLOC P21LOC		
0058					22,3242				BANK		
0059	REF	2	LAST	44 TO	44:	4	4*		CCLNT* 15/R30		
0060	REF	92	LAST	711	22,3242	1	6042	1	V82CALL	TC	INIPRET
0061					22,3242	52014	0		BCN		GCTC
0062	REF	2	LAST	229	22,3244	1	2712	0			AVEGFLAG
0063	REF	1			22,3245	45445	1				V82GCM
0064	REF	1			22,3246	45247	1				V82GCMF
											IF AVERAGE G ON
											IF AVERAGE G OFF
0065					22,3247	77776	1		V82GCMF	EXIT	
0066	REF	39	LAST	567	22,3250	3	4752	0		CAF	TWC
0067	REF	11	LAST	340	22,3251	55050	1			TS	OPTICMX
0068	REF	81	LAST	655	22,3252	3	4753	1		CAF	ONE
0069	REF	12	LAST	713	22,3253	55051	0			TS	OPTICMX +1
0070	REF	1			22,3254	3	3316	0		CAF	OPTICMX
0071	REF	182	LAST	711	22,3255	0	4616	1		TC	BANKCALL
0072	REF	8	LAST	611	22,3256	20234	1			CACR	GCMSPF
0073	REF	4	LAST	706	22,3257	1	5472	0		TC	ENDEXT
0074					22,3260	0	3262	1		TC	+2
0075					22,3261	0	3254	1		TC	-5
A0076											
0077	REF	29	LAST	607	22,3262	3	4751	1		CAF	BIT4
0078	REF	30	LAST	653	22,3263	0	5212	0		TC	WAITLIST
0079	REF	3	LAST	315	F4,1540					EBANK= TFF	
0080	REF	1			22,3264	0	2430	0		2CACR	TICKTEST
0081	REF	1			22,3265	44064	0				
0082	REF	1			22,3266	0	0073	1		REFINT	
0083	REF	20	LAST	678	22,3271	54	003	0		CAF	TFFBANK
0084	REF	129	LAST	711	22,3271	3	4755	1		TS	EBANK
0085	REF	2	LAST	116	22,3272	55057	0			CAF	ZFRD
A0086										TS	V82FLAGS
0087	REF	6	LAST	293	22,3273	2	5021	1		CAF	PRIC7
0088	REF	25	LAST	703	22,3274	0	5115	0		TC	FINDVAC
0089	REF	4	LAST	713	F4,1540					EBANK= TFF	
0090	REF	1			22,3275	0	3321	1		2CACR	V82GCMF1
0091	REF	1			22,3276	44164	0				
0092	REF	21	LAST	604	22,3277	0	0073	1		REFINT	
					22,3278	3	6251	0		V82STALL	CAF
											THREE
											STALL IN THIS LOOP AND WITHOLD V 16 N 44

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0093	REF	7	LAST	713	22,3301	7 1537	C	MASK	V82FLACS	UNTIL STATE VECTOR UPDATE SETS ONE OF	
0094	REF	218	LAST	678	22,3302	17 0000	0	CCS	A	CLK FLAG BITS.	
0095	REF	1			22,3303	0 3311	0	TC	FLAGGCN	EXIT FROM STALL LOOP.	
0096	REF	7	LAST	680	22,3304	3 4777	1	CAF	1SEC		
0097	REF	133	LAST	713	22,3305	0 4616	1	TC	BANKCALL		
0098	REF	10	LAST	680	22,3306	01736	1	CADR	DELAYJOB		
0099	REF	1			22,3307	0 22 0	1	TC	V82STALL		
0100	REF	1			22,3310	3 3317	1	FLAGGCN	CAF	V16N44	MONITOR FAPC, FPER, TFF.
0101	REF	184	LAST	714	22,3311	0 4416	1	TC	BANKCALL		
0102	REF	9	LAST	713	22,3312	2 2334	1	CADR	GCXDSFF		
0103	REF	11	LAST	703	22,3313	3 5563	1	TC	RSCFF	TERM THIS TELLS TICKTEST TO KILL ITSELF	
0104	REF	12	LAST	714	22,3314	5 5563	1	TC	RSCFF	PRECCED CTTT	
0105	REF	1			22,3315	0 3267	1	TC	VE2GOFLP	RECYCLE RECOMPUTE STATE VECT + DISPLAY	
0106					22,3316	01014	0	CPT1CNVM	VN	412	
0107					22,3317	04054	1		V16N44	VN	1644
0108	REF	5	LAST	713	22,3320	02140	0	TFFRANK	FCADR	TFF	
0109	REF	52	LAST	713	22,3321	0 6042	1	V82CCFF1	TC	INTERPT	
0110					22,3322	77624	0		RTB		
0111	REF	20	LAST	707	22,3323	21574	1		LCADTIME		
0112	REF	39	LAST	710	22,3324	00041	1		STCPE	TCEC1	TIME FOR STATE VECTOR UPDATE.
0113	REF	3	LAST	340	22,3325	02205	1		STCPE	TSTART2	TIME FOR INTERNAL USE.
0114					22,3326	77776	1		EXIT		
0115	REF	13	LAST	713	22,3327	4 1451	0	CS	CPT1CNX +1	1 FOR THIS VEHICLE, NCT 1 FOR OTHER.	
0116	REF	82	LAST	713	22,3330	6 4753	1	AD	ONE		
0117					22,3331	0 0006	1	EXTEND			
0118	REF	1			22,3332	1 2356	0	BZF	THISHIP		
0119	REF	54	LAST	714	22,3333	0 6042	1	OTHERHIP	TC	INTERPT	
0120					22,3334	77624	1		CALL		
0121	REF	3	LAST	710	22,3335	27244	1		OTHERPREC	CALL STATE VECTOR UPDATE FOR OTHER SHIP.	
0122					22,3336	77775	1	OTHERSHIP	VLCAC		
0123	REF	23	LAST	711	22,3337	00001	0		RATT	MOVE RESULTS INTO TFFCNIC STORAGE AREAS	
0124	REF	11	LAST	706	22,3340	26207	0		STOVL	TO BE CALLED BY SR30.1.	
0125	REF	16	LAST	710	22,3341	00007	0		VATT	RATT AT (-25)M FOR EARTH OR MOON	
0126	REF	5	LAST	706	22,3342	02215	0		STORE	VONE	
0127					22,3343	77743	1		CLCAD*	VATT AT (-7)M/CS FOR EARTH OR MOON	
0128	REF	1			22,3344	73774	1		1/RTMUF,2	X2 IS 0 FOR EARTH CENTERED STATE VEC	
0129	REF	1			22,3345	00137	0		STORE	TFF/RTML	
0130					22,3346	77743	1		CLCAD*	X2 IS 2 FOR MOON	
0131	REF	1			22,3347	72411	0			AS LEFT BY THISPREC OR OTHERPREC.	
0132	REF	2	LAST	116	22,3350	02201	0		STORE	MINPERF,2	
0133					22,3351	46135	1		SLCAC	HPERMIN	
0134	REF	12	LAST	696	22,3352	00052	1			REF12	
0135	REF	1			22,3353	45367	1			X2	
0136					22,3354	77650	1			EARTH PAD	
0137	REF	1			22,3355	45373	1		GLTC	MOON PAD	

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0138	REF	95	LAST	714	22,3356	6742	1	THISSHIP	TO	INTEREST		
0139					22,3357	77624	1		CALL		CALL STATE VECTOR UPDATE FOR THIS SHIP.	
0140	REF	2	LAST	701	22,3360	2736	1			THISPEC		
0141					22,3361	77650	1		GOTO			
0142	REF	1			22,3362	45336	0			BOTHSHIP		
P0143 THE FOLLOWING CONSTANTS ARE PAIRWISE INDEXED. DO NOT SEPARATE PAIRS.												
0146					22,3363	00001	0	MINPERM	2DEC	10668	B-27	35 KFT MIN PERIGEE HEIGHT FOR MOON(-27)M
0146					22,3364	1153	1					
0147					22,3365	00002	0	MINPERE	2DEC	9144	B-29	300 KFT (-29)M FOR EARTH
0147					22,3366	3123	1					
0148					22,3367	43145	0	EARTHFAE	CLCAD	CLFGE		PAC 37-F RADIUS. SCALED AT (-29)M.
0149	REF	2	LAST	696	22,3370	0624	0			RFAD		
0150	REF	1			22,3371	03635	1			VE2EMFLG		INDICATE EARTH SCALING FOR SR30.1
0151	REF	1			22,3372	45377	0			RETHPAD		
0152					22,3373	51575	1	MOONPAD	VLCAD	ABVAL		COMPUTE MOON PAD RADIUS FROM RLS VECTOR.
0153	REF	4	LAST	696	22,3374	02223	1			RLS		SCALED AT (-27)M.
0154					22,3375	77614	1		SET			
0155	REF	2	LAST	715	22,3376	03475	1			VE2EMFLG		INDICATE MOON SCALING FOR SR30.1
0156	REF	2	LAST	116	22,3377	36213	0	RETHPAD	STCALL	RFADTFM		
0157	REF	1			22,3400	45551	1			SP3.1		CALCULATE ORBITAL PARAMETERS
0158					22,3401	45234	0		RTB	DSU		
0159	REF	21	LAST	714	22,3402	21574	1			LC/DTIME		
0160	REF	4	LAST	714	22,3403	02205	1			TSTART82		PRESNET TIME - TIME V820CFF1 BEGAN
0161	REF	5	LAST	715	22,3404	02205	1		STORE	TSTART82		SAVE IT
0162					22,3405	52145	1		CLCAD	BZE		SR30.1 SETS -TPER=0 IF HPER L/
0163	REF	2	LAST	307	22,3406	02143	0			-TPER		HPERMIN (300 OR 35) KFT.
0164	REF	1			22,3407	45421	0			TICKTFF		(-TPER = 0)
0165					22,3410	42345	1	TICKTFF	CLCAD	DAD		(-TPER ACN 2FRC) TFF WAS NOT COMPLETED,
0166	REF	3	LAST	715	22,3411	02143	0			-TPER		BLT WAS SET TO 59454S.0001 TICK TFF, DO
0167	REF	6	LAST	715	22,3412	02205	1			TSTART82		TICK -TPER. DISPLAY BOTH.
0168	REF	4	LAST	715	22,3413	02143	0		STORE	-TPER		-TPER CORRECTED FOR TIME SINCE V820CFF1
0169					22,3414	77776	1		EXIT			BEGAN.
0170	REF	34	LAST	576	22,3415	34763	1		CAF	RIT1		
0171	REF	4	LAST	714	22,3416	55537	0		TS	V82FLAGS		INFORMS TICKTEST TO INCREMENT ONLY -TPER
0172	REF	105	LAST	610	22,3417	05155	0		TC	ENDCFJOP		
0173					22,3420	42345	1	TICKTFF	CLCAD	DAD		(-TPER=0) TFF WAS COMPLETED. TICK TFF.
0174	REF	6	LAST	714	22,3421	02141	1			TFF		DO NOT TICK -TPER. DISPLAY TFF, BUT NOT
0175	REF	7	LAST	715	22,3422	02205	1			TSTART82		-TPER.
0176	REF	7	LAST	715	22,3423	02141	1		STORE	TFF		TFF CORRECTED FOR TIME SINCE V820CFF1
0177					22,3424	77776	1		EXIT			BEGAN.
0178	REF	27	LAST	655	22,3425	34762	0		CAF	RIT2		
0179	REF	5	LAST	715	22,3426	55537	0		TS	V82FLAGS		INFORMS TICKTEST TO INCREMENT ONLY TFF.
0180	REF	106	LAST	715	22,3427	05155	0		TC	ENDCFJOP		

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0181	REF	31	LAST	714	22,343	3 4747 1	TICKTEST	CAF	RIT5	THIS WAITLIST PROGRAM PERPETUATES ITSELF ONCE A SFC UNTIL BIT 5 OF EXTTRACT = 0.
0182	REF	14	LAST	714	22,343	7 1143 0		MASK	EXTTRACT	
0183	REF	219	LAST	714	22,3422	10 000 0		CCS	A	
0184	REF	1			22,3433	0 3441 0		TC	DOTICK	
0185	REF	3	LAST	595	22,3434	3 7716 0		CAF	PRIC25	
0186	REF	15	LAST	713	22,2435	0 5772 1		TC	NCVAC	TERMINATE V 82.CANT CALL ENDEXT IN RPT.
0187	REF	15	LAST	716	1043			EBANK=	EXTTRACT	
0188	REF	41	LAST	713	22,3436	05472 0		2CADR	ENDEXT	
0188					22,3437	04062 1				
0189	REF	31	LAST	703	22,3440	0 5261 1		TC	TASKOVER	
0190	REF	9	LAST	714	22,3441	3 4777 1	DOTICK	CAF	1SEC	RE-REQUEST TICKTEST.
0191	REF	31	LAST	713	22,3442	0 5203 0		TC	WAITLIST	
0192	REF	8	LAST	715	04,1546			EBANK=	TFF	
0193	REF	2	LAST	713	22,3443	0,3430 0		2CADR	TICKTEST	
0193					22,3444	44064 0				
0194	REF	21	LAST	713	22,3445	3 6250 0		CAF	THREE	
0195	REF	6	LAST	715	22,3446	7 1537 0		MASK	V82FLAGS	
0196	REF	220	LAST	716	22,3447	50 000 1		INDEX	A	
0197					22,3450	0 3451 1		TC	+1	
0198	REF	32	LAST	716	22,3451	0 5261 1		TC	TASKOVER	IF NO FLAGBITS SET DONT CHANGE TFF OR -TFF, BUT CONTINUE LOOP.
A0199										
0200	REF	1			22,3452	0 3450 0		TC	TPERTICK	ONLY BIT 1 SET. INCR -TFF BY 1 SEC.
0201	REF	5	LAST	716	22,3453	3 4777 1	TFFTICK	CAF	1SEC	ONLY BIT 2 SET. INCR TFF BY 1 SEC.
0202	REF	99	LAST	712	22,3454	54 001 1		TS	L	
0203	REF	120	LAST	713	22,3455	3 4755 1		CAF	ZERO	
0204	REF	9	LAST	716	22,3456	21 541 1		CAS	TFF	
0205	REF	33	LAST	716	22,3457	0 5261 1		TC	TASKOVER	
0206	REF	10	LAST	716	22,3460	3 4777 1	TPERTICK	CAF	1SEC	
0207	REF	100	LAST	716	22,3461	54 001 1		TS	L	
0208	REF	121	LAST	716	22,3462	3 4755 1		CAF	ZERO	
0209	REF	5	LAST	715	22,3463	21 543 0		CAS	-TFF	
0210	REF	34	LAST	716	22,3464	0 5261 1		TC	TASKOVER	

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0211					22,3465	77776 1	V82GCM	EXIT		AVERAGE G ON. USE CURRENT STATE VECTOR FOR ORBITAL PARAMETER CALCULATIONS.
A0212										LESS THAN LAMBERT
0213	REF	7	LAST	713	22,3466	3 5021 1		CAF	PR107	
0214	REF	26	LAST	713	22,3467	0 5105 0		TC	FINDVAC	V82GCM1 WILL PERFORM ORBIT CALCULATIONS
0215	REF	19	LAST	716	22,3468	0 5144 0		EBANK=	TEF	ABCLT PROPER BODY APPROX ONCE PER SEC.
0216	REF	1			22,3470	0 3513 1		ZCAGR	V82GCM1	
0216	REF	1			22,3471	44064 0				
0217					22,3472	0 1112 1		RELINT		
0218	REF	4	LAST	554	22,3473	10 167 1		CCS	NEWJCP	WITHOLD V16 N44 UNTIL FIRST ORBIT CALC
0219	REF	3	LAST	554	22,3474	0 5122 0		TC	CHANG1	IS DONE. NOTE: V82GCM1 (PRIC7, FINDVAC JOB) IS COMPLETED BEFORE V82GCM (PRIC7, NEWJCP).
A0220										MONITOR HARP, HPRF, TEF
0222	REF	2	LAST	714	22,3475	3 3317 1	V82R-CSP	CAF	V16N44	
0223	REF	185	LAST	714	22,3476	0 4515 1		TC	PANKCALL	
0224	REF	10	LAST	714	22,3477	20334 1		CACP	GTDCSFF	
0225	REF	13	LAST	714	22,3511	1 5563 1		TC	B5OFF	TEPM THIS TELLS V82GCM1 TO KILL ITSELF.
0226	REF	14	LAST	717	22,3511	0 5563 1		TC	B5OFF	PRCC CITTQ.
0227	REF	1			22,3512	0 3475 1		TC	V82PEDSP	RECYCLE
0228	REF	96	LAST	715	22,3513	0 6142 1	V82GCM1	TC	INTPRET	THIS EXEC PROGRAM PERPETUATES ITSELF
A0229										ONCE A SEC UNTIL BIT 5 OF EXTRACT =0.
0231					22,3514	52175 0		VLCAD	GCTQ	FIELDS OFF CCS NEWJCB BETWEEN FN AND
0231	REF	6	LAST	716	22,3515	01221 0		PN		VN FETCH SO PN, VN ARE FROM SAME
0232	REF	1			22,3516	45517 0			NEXTLINE	STATE VECTOR UPDATE.
0233	REF	12	LAST	714	22,3517	26257 0	NEXTLINE	STOVL	RONE	PN AT (-25)M FOR EARTH OR MOON
0234	REF	6	LAST	716	22,3518	01226 0			VN	
0235	REF	6	LAST	714	22,3511	02215 0		STORE	VON	VN AT (-7)M/CS FOR EARTH OR MOON
0236					22,3512	52114 0		BON	GCTQ	
0237	REF	4	LAST	705	22,3513	14314 1			MOONTHIS	FLAG INDICATES POEY ABOUT WHICH ORBITAL
0238	REF	1			22,3514	45516 1			MOONGEN	CALCULATIONS ARE TO BE PERFORMED.
0239	REF	1			22,3515	45527 0			EARTHCON	IF SET - MOON, IF RESET - EARTH.
0241					22,3516	71214 0	MOONGEN	SET	DLCAD	
0241	REF	3	LAST	715	22,3517	03475 1			V82EMFLG	INDICATE MOON SCALING FOR SR30.1
0242	REF	1			22,3520	04001 1			1/PTMLM	LUNAR PARAMETERS LOADED HERE FOR SR30.1
0243	REF	2	LAST	714	22,3521	14137 0		STOVL	TEF/PTML	
0244	REF	1			22,3522	05364 0			MINPERF	
0245	REF	3	LAST	714	22,3523	26251 0		STOVL	HPRFMIN	
0246	REF	5	LAST	715	22,3524	02123 1			KLS	SCALED AT (-27)M.
0247					22,3525	52146 1		APVAL	GCTC	
0248	REF	1			22,3526	45536 0			V82GCM2	
0249					22,3527	71214 0	EARTHCON	CLFAP	DLCAD	
0251	REF	4	LAST	717	22,3530	03675 0			V82EMFLG	INDICATE EARTH SCALING FOR SR30.1
0251	REF	2	LAST	714	22,3531	04003 0			1/PTMLM	EARTH PARAMETERS LOADED HERE FOR SR30.1
0252	REF	3	LAST	717	22,3532	14137 0		STOVL	TEF/PTML	
0253	REF	2	LAST	714	22,3533	05366 1			MINPERF	
0254	REF	4	LAST	717	22,3534	16231 0		STOVL	HPRFMIN	
0255	REF	3	LAST	715	22,3535	06347 0			RPAC	
0256	REF	3	LAST	715	22,3536	26214 0	V82GCM2	STCALL	RPADTEM	COMMON CODE FOR EARTH & MOON.
0257	REF	2	LAST	715	22,3537	45551 1			SR30.1	

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0258					22,3540	77776 1	EXIT		
0259	REF	32	LAST	716	22,3541	3 4747 1	V82GCN3	CAF	BITS
0260	REF	16	LAST	716	22,3542	7 1343 0		MASK	EXTVRACT
									SEE IF ASTRONAUT HAS SIGNALLED TERMINATE
0261					22,3543	0 0006 1		EXTEND	
0262	REF	42	LAST	716	22,3544	1 5472 1		EZF	FNEXT
0263	REF	11	LAST	716	22,3545	3 4777 1		CAF	ISEC
									YES, TERMINATE VB 82 LCCP
0264	REF	176	LAST	717	22,3546	0 4616 1		TC	PANKCALL
0265	REF	11	LAST	714	22,3547	01736 1		CAER	DELAYJOB
									WAIT ONE SECOND BEFORE REPEATING
0266	REF	2	LAST	717	22,3553	1 3553 1		TC	V82GCN1
									ORRITAL PARAMETER COMPLETION.
0267	REF	1			22,3541		SPLPET	=	V82GCN3

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R0268 SUBROUTINE NAME: SR30.1
 R0269 MOD NO: 1
 R0271 MOD BY: RR BAIRNSEATHER
 R0273 MOD NO: 1 MOD BY: RR BAIRNSEATHER DATE: 11 APR 67
 R0275 MOD NO: 2 MOD BY: RR BAIRNSEATHER DATE: 14 APR 67
 R0277 MOD NO: 3 MOD BY: ALCASC DATE: 11 DEC 67
 R0279 MOD NO: 4 MOD BY: ALCASC DATE: 26 MAR 68
 R0291 MOD NO: 5 MOD BY: RR BAIRNSEATHER DATE: 6 AUG 68
 R0293
 CATE: 16 FEB 67
 LCG SECTION: F32
 SR30.1 CHANGED TO ALLOW MONITOR OFFRA
 MOD CVFL CK FOR PAFC
 SUBROUTINE REWRITTEN
 PROG MOD TO HANDLE DIF EARTH/MOON SCALE
 CVFL CK FOR HAPC & HPER.VCIDS MOD #2.

R0284 NEW FUNCTIONAL DESCRIPTION: ORBITAL PARAMETERS DISPLAY FOR MOONS 32 AND 44.
 R0286 SR30.1 CALLS TFECCNMU AND TFEFP/PA TO CALCULATE RPER (PERIGEE RADIUS),
 R0287 RAPP (APOGEE RADIUS), HPER (PERIGEE HEIGHT ABOVE LAUNCH PAD OR LUNAR
 R0288 LANDING SITE), HAPC (APOGEE HEIGHT AS ABOVE), TPER (TIME TO PERIGEE),
 R0289 TFF (TIME TO INTERSECT 300 KFT ABOVE PAD OR 25KFT ABOVE LANDING SITE).
 R0290 IF HPER IS GREATER THAN OR EQUAL TO HPERMIN, CALCULATES TPER AND STORES
 R0291 NEGATIVE. IN -TPER. OTHERWISE STORES 0 IN -TPER. WHENEVER TPER IS
 R0292 CALCULATED, TFF IS NOT COMPUTABLE AND DEFAULTS TO -59MIN 59SEC. IF HAPD
 R0293 WOULD EXCEED 9999.9 NM, IT IS LIMITED TO THAT VALUE FOR DISPLAY.

R0294 APPENDUM: HAPC AND HPER SHOULD BE CHANGED TO READ HAPDX AND HPERX IN THE
 R0295 ABOVE REMARKS.

R0296 CALLING SEQUENCE: CALL
 R0297 SR30.1
 R0298 SUBROUTINES CALLED: TFECCNMU, TFEFP/PA, CALCTPER, CALCTFF
 R0299 NORMAL EXIT MODE: CALLING LINE +1 (STILL IN INTERPRETIVE MODE)
 R0300 ALARMS: ARAF

R0301 OUTPUT: PAPO (-29) M EARTH APOGEE RADIUS EARTH CENTERED COORD.
 R0302 (-27) M MOON MOON CENTERED COORD.
 R0303 RPER (-29) M EARTH PERIGEE RADIUS EARTH CENTERED COORD.
 R0304 (-27) M MOON MOON CENTERED COORD.
 R0305 HAPDX (-29) M APOGEE ALTITUDE ABOVE PAD OR LAND. SITE MAX VALUE LIMITED TO 9999.9 NM.
 R0307 HPERX (-29) M PERIGEE ALT. ABOVE PAD OR LAND. SITE MAX VALUE LIMITED TO 9999.9 NM.
 R0309 TFF (-28) CS TIME TO 300KFT OR 25KFT ALTITUDE
 R0310 -TPER (-28) CS TIME TO PERIGEE

R0311 FRASAPI INITIALIZATION REQUIRED-
 R0312 TFF/RTMU (+17) EARTH RECIPROCAL OF PROPER GRAV CONSTANT FOR
 R0313 (+14) MOON EARTH OR MOON = 1/SGRT(MU).

R0314 RONE (-29) M STATE VECTOR
 R0315 V7AC (-7) M/CS STATE VECTOR
 R0316 RPADEM (-29) M EARTH RADIUS OF LAUNCH PAD OR LUNAR LANDING
 R0317 (-27) M MOON SITE.
 R0318 HPERMIN (-29) M EARTH (200 OR 35)KFT MINIMUM PERIGEE ALTITUDE
 R0319 (-27) M MOON ABOVE LAUNCH PAD OR LUNAR LANDING SITE.
 R0320 V82FMLE (INT SW BIT) RESET FOR EARTH, SET FOR MOON.

R0321 DEBIS: CREF1, FCL, S2

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LINE	REF	1	COUNT#	11/SP30S
0322	REF	1		
0323			22,3551	44011 0 SP30.1 SETPC STO INITIALIZE PUSH-DOWN LIST.
0324			22,3552	00101 0 0
0325	REF	7 LAST 613	22,3553	00151 0 S2
A0326				
A0327				SR30.1 INPUT: RONE AT (-29)M EARTH/MCCN
A0328				VCNE AT (-7)M/CS
A0329				TFCCNMU, TFRP/RA, CALCTPR AND CALCTFF
A0330				CALLS REQUIRE :
A0331				EARTH CENTERED (NO RESCALING REQUIRED)
A0332				RONE SCALED TO B-29 M
A0333				VCNE SCALED TO B-7 M/CS
A0334				MCCN CENTERED (RESCALING REQUIRED)
A0335				RONE SCALED TO B-27 M
				VCNE SCALED TO B-5 M/CS
0336			22,3554	77214 0 PCFF VLCAO
0337	REF	5 LAST 717	22,3555	03755 0 V82EMFLG OFF FOR EARTH, ON FOR MCCN.
0338	REF	1	22,3556	45565 0 TFFCALLS
0339	REF	13 LAST 717	22,3557	02207 0 RONE
0340			22,3560	77752 1 VSL2
0341	REF	14 LAST 720	22,3561	26207 0 STOVL RONE
0342	REF	7 LAST 717	22,3562	02215 0 VCNE
0343			22,3563	77752 1 VSL2
0344	REF	8 LAST 720	22,3564	02215 0 STOPE VCNE
0345			22,3565	77624 1 TFFCALLS CALL
0346	REF	1	22,3566	57261 1 TFFCCNMU
0347			22,3567	77624 1 CALL
0348	REF	1	22,3570	57427 1 TFFRP/RA
A0349				
0350			22,3571	77625 0 DSL
0351	REF	4 LAST 717	22,3572	62203 1 RPACTEM
0352			22,3573	64414 1 BOFF SR2R
A0353				
A0354				
0355	REF	6 LAST 720	22,3574	03755 0 V82EMFLG
0356			22,3575	45576 1 +1
0357			22,3576	77624 1 CALL
0358	REF	2 LAST 620	22,3577	45636 0 MAXCHK
0359	REF	4 LAST 712	22,3600	16120 0 STORHAPC STOVL HAPCX
0360	REF	1	22,3611	01117 1 RPER
0361			22,3602	77625 0 DSL
0362	REF	5 LAST 720	22,3613	12203 1 RPACTEM
0363	REF	250 LAST 701	22,3604	01161 1 STORE MPAC +4
0364			22,3605	64414 1 PCFF SR2R
A0365				
A0366				
0367	REF	7 LAST 720	22,3616	03755 0 V82EMFLG
0368			22,3607	45610 1 +1
0369			22,3610	77624 1 CALL
0370	REF	4 LAST 720	22,3611	45636 0 MAXCHK

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0371	PEF	2	LAST	315	22,2612	16122 1	STCRHPR	STCLL	HPRX	STORE (RPER - RPACTEM) INTO HPRPX.
0372	PEF	201	LAST	720	22,2613	17161 1			MPAC +4	
0373					22,2614	51025 1		DSU	BPL	HPRMIN AT (-29)M FOR EARTH, (-27)M MOON
0374	PEF	5	LAST	717	22,2615	02211 0			HPRMIN	IF HPRF L/ HPRMIN (300 OR 35)KFT,
0375	PEF	1			22,2616	45622 0			DOTPER	THEN ZFRO INTO -TPER.
0376					22,2617	52145 0		DLGAC	CCTC	OTHERWISE CALCULATE TPER.
0377	PEF	4	LAST	596	22,2620	06524 1			H16ZEPDS	
0378	PEF	1			22,2621	45626 1			SKIPTPER	
0379					22,2622	45145 0	ECTPER	DLGAC	CALL	
0381	PEF	2	LAST	720	22,2623	00017 1			RPER	
0381	PEF	1			22,2624	57465 1			CALCTPER	
0382					22,2625	77676 0		DCOMP		TPER IS FJT NEG INTO -TPER.
0383	PEF	0	LAST	716	22,2626	16142 0	SKIPTPER	STCLL	-TPER	
0384	PEF	6	LAST	721	22,2627	02201 0			HPRMIN	HPRMIN AT (-29)M FOR EARTH, (-27)M MOON
0385					22,2628	45015 1		DAD	CALL	
0386	PEF	6	LAST	720	22,2631	02213 1			RPACTEM	RPACTEM AT (-29)M FOR EARTH, (-27)M MOON
0387	PEF	1			22,2632	57470 0			CALCTFF	GIVES 59M59S FOR TFF IF RPER G/
0388					22,2633	77676 0		DCOMP		HPRMIN + RPACTEM. (TPER WAS NON ZERO)
0389	PEF	11	LAST	717	22,2634	36141 0		STCALL	TFF	OTHERWISE COMPUTES TFF. (GETC)
0390	PEF	2	LAST	720	22,2635	00051 0			S2	
0391					22,2636	51025 1	MAXCHK	DSU	BPL	IF C(MPAC) > 9999.9 NM, MPAC = 9999.9 NM
0392	PEF	1			22,2637	05646 0			MAXNM	
0393					22,2638	45642 1			+3	OTHERWISE C(MPAC) = B(MPAC).
0394					22,2641	43415 0		DAD	RVC	
0395	PEF	2	LAST	721	22,2642	05646 0			MAXNM	
0396					22,2643	43545 1	+3	PLCAD	RVC	(USED BY P30 - P37 ALSO)
0397	PEF	3	LAST	721	22,2644	05646 0			MAXNM	
0398					22,2645	01065 0	MAXNM	DOCT	01065 05603	
0398					22,2646	05603 1				

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*** END OF KISSING .053 ***

L BURN, BABY, BURN -- MASTER IGNITION ROUTINE

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0001 36,2024 BANK 36
 0112 PFF 3 LAST 40 36,2100 SFTLOC P4-15
 0113 36,2124 BANK
 0004 PFF 3 LAST 652 57,1455 FBANK= WHICH
 0115 PFF 3 LAST 40 TO 40: 2 20* COUNT* 53/P46
 0006 THE MASTER IGNITION ROUTINE IS DESIGNED FOR USE BY THE FOLLOWING LEM PROGRAMS: P12, P40, P42, P61, P63.
 0008 IT PERFORMS ALL FUNCTIONS IMMEDIATELY ASSOCIATED WITH APS OR CPS IGNITION: IN PARTICULAR, EVERYTHING LYING
 0001 BETWEEN THE PFF-IGNITION TIME CHECK -- ARE WE WITHIN 45 SECONDS OF TIG? -- AND TIG + 26 SECONDS, WHEN CPS
 0012 PROGRAMS THRUSTLE UP.

R0013 VARIATIONS AMONG PROGRAMS ARE ACCOMMODATED BY MEANS OF TABLES CONTAINING CONSTANTS (FOR AVEGEXIT, FOR
 R0015 WAITLIST, FOR PINEALL) AND TCF INSTRUCTIONS. USERS PLACE THE ADRES OF THE HEAD OF THE APPROPRIATE TABLE
 R0017 (OF P4TABLE FOR P41LM, FOR EXAMPLE) IN FRASAELE REGISTER 'WHICH' (E4). THE IGNITION ROUTINE THEN INDEXES BY
 R0019 WHICH TO OBTAIN OR EXECUTE THE PROPER TABLE ENTRY. THE IGNITION ROUTINE IS INITIATED BY A TCF BURNEASY,
 R0021 THROUGH BANKJUMP IF NECESSARY. THERE IS NO RETURN.

R0022 THE MASTER IGNITION ROUTINE WAS CONCEIVED AND EXECUTED, AND (NOTA BENE) IS MAINTAINED BY ADLER AND EYLES.

R0024 FROM SORT QUI MAY PLEASE

R0025 *****
 R0026 TABLES FOR THE IGNITION ROUTINE
 R0027 *****

R0028 NCL1 SE TANGEPE

0029		36,2124	41512 0	P12TABLE VN	0674	(0)	
0030	PFF 1	36,2125	1 2327 1	TCF	ULLGNCT	(1)	
0031	PFF 1	36,2126	1 2616 0	TCF	CCNFALB	(2)	
0132	PFF 1	36,2127	1 3066 0	TCF	GCOUTOFF	(3)	
0033	PFF 25 LAST 716	36,2130	1 5261 0	TCF	TASKCOVER	(4)	
0034	PFF 1	36,2131	1 2150 0	TCF	P12SFT	(5)	
0035		36,2132	0000 1	DFC	0	(6)	NO ULLAGE
0036	PFF 4 LAST 722	57,1455		FBANK= WHICH			
0037	PFF 1	36,2133	03741 1	2CADP	SERVEEXIT	(7)	
0037	PFF 1	36,2134	64067 1				
0038	PFF 1	36,2135	1 2402 1	TCF	DISPCENG	(11)	
0039	PFF 1	36,2136	1 2567 0	TCF	WAITARIT	(12)	
0040	PFF 1	36,2137	1 2525 0	TCF	P12TEN	(13)	

0044		36,2140	1450 1	P40TABLE VN	0640	(0)	
0045	PFF 2 LAST 723	36,2141	1 2327 1	TCF	ULLGNCT	(1)	
0046	PFF 1	36,2142	1 2620 0	TCF	CCNFALB	(2)	
0047	PFF 1	36,2143	1 3053 0	TCF	GCPCST	(2)	
0048	PFF 25 LAST 722	36,2144	1 5261 0	TCF	TASKCOVER	(4)	
0049	PFF 1	36,2145	1 2150 0	TCF	P40SPCT	(5)	

L RUN, BABY, RUN -- MASTER IGNITION ROUTINE

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0051					36,2046	04300 0	DEC	2241	(6)
0051	REF	1			E6,1422		EBANK=	DMFGAQ	
0052	REF	1			36,2047	03672 1	2CADR	STEERING	(7)
0052	REF	1			36,2050	74066 1			
0053	REF	1			36,2051	1 2372 1	TCF	P40SJUNK	(11)
0054	REF	2	LAST	723	36,2052	1 2567 0	TCF	WAITABIT	(12)
0055	REF	1			36,2053	1 2510 0	TCF	P40IGN	(13)
0056	REF	1			36,2054	1 3127 1	TCF	RFP4CALM	(14)

R0058

0060	REF	1			36,2055	1 2153 0	P41TABLE	TCF	P41SPCT	(5)
0061					36,2056	77775 1	DEC	-1	(6)	
0062	REF	2	LAST	724	E6,1422		EBANK=	DMFGAQ		
0063	REF	1			36,2057	03472 1	2CADR	CALCRES	(7)	
0063	REF	1			36,2060	74066 1				
0064	REF	1			36,2061	1 2414 1	TCF	CCMMCN	(11)	
0065	REF	1			36,2062	1 2573 0	TCF	TIGTASK	(12)	

R0066

0067					36,2063	01450 1	P42TABLE	VM	0640	(0)
0068	REF	1			36,2064	1 2324 1	TCF	WANTAPS	(1)	
0069	REF	2	LAST	723	36,2065	1 2620 0	TCF	CCMFAIL4	(2)	
0070	REF	2	LAST	723	36,2066	1 3053 0	TCF	GDPOST	(3)	
0071	REF	27	LAST	723	36,2067	1 5261 0	TCF	TASKOVER	(4)	
0072	REF	1			36,2070	1 2150 0	TCF	P42SPCT	(5)	
0073					36,2071	05120 1	DEC	2640	(6)	
0074	REF	3	LAST	724	E6,1422		EBANK=	DMFGAQ		
0075	REF	2	LAST	724	36,2072	03672 1	2CADR	STEERING	(7)	
0075					36,2073	74066 1				
0076	REF	2	LAST	724	36,2074	1 2372 1	TCF	P40SJUNK	(11)	
0077	REF	3	LAST	724	36,2075	1 2567 0	TCF	WAITABIT	(12)	
0078	REF	1			36,2076	1 2545 0	TCF	P42IGN	(13)	
0079	REF	1			36,2077	1 2424 1	TCF	P42STAGE	(14)	

R0081

0082					36,2100	01476 0	P63TABLE	VM	0662	(0)
0083	REF	3	LAST	723	36,2101	1 2327 1	TCF	ULLGNPT	(1)	
0084	REF	2	LAST	723	36,2102	1 2616 0	TCF	CCMFAIL3	(2)	
0085	REF	1			36,2103	1 2003 0	TCF	V99PECYC	(3)	
0086	REF	38	LAST	724	36,2104	1 5261 0	TCF	TASKOVER	(4)	
0087	REF	1			36,2105	1 2153 0	TCF	P63SPCT	(5)	
0088					36,2106	04300 0	DEC	2241	(6)	
0089	REF	5	LAST	723	E7,1465		EBANK=	WHICH		
0090	REF	2	LAST	723	36,2107	03761 1	2CADR	SERVEXIT	(7)	
0090					36,2110	64067 1				
0091	REF	2	LAST	723	36,2111	1 2412 1	TCF	P15PCFNG	(11)	
0092	REF	4	LAST	724	36,2112	1 2567 0	TCF	WAITABIT	(12)	

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0093 RFF 1 36,2113 1 2474 1 TCF P63IGN (13)
 0096

0112 36,2114 01477 1 AERTAEF VN 0663 (0)
 0113 RFF 4 LAST 724 36,2115 1 2327 1 TCF LLLGNCT (1)
 0114 RFF 3 LAST 724 36,2116 1 2616 0 TCF CCFFAIL3 (2)
 0115 RFF 2 LAST 723 36,2117 1 3066 0 TCF GCOUTOFF (3)
 0116 RFF 29 LAST 724 36,2120 1 5261 0 TCF TASKOVER (4)
 0117 36,2121 12 122 0 N00P (5)
 0118 36,2122 12 123 1 N00P (6)
 0119 36,2123 12 124 0 N00P (7)
 0120 36,2124 12 125 1 N00P
 0121 RFF 2 LAST 724 36,2125 1 2412 1 TCF DISPCING (11)
 0122 RFF 5 LAST 724 36,2126 1 2567 1 TCF WAITARIT (12)
 0123 RFF 1 36,2127 1 2535 1 TCF ABRTION (13)
 0126

R0127 *****
 R0128 GENERAL PURPOSE IGNITION ROUTINES
 R0129 *****

0130 RFF 28 LAST 711 36,2130 0 5353 1 BURNBARY TC PHASCHNG GRPL 4 RESTARTS HERE
 0131 36,2131 0 4124 0 TCF 04024
 0132 RFF 132 LAST 716 36,2132 3 4755 1 CAF ZERO EXTIRPATE JUNK LEFT IN EVICTAL
 0133 RFF 4 LAST 716 36,2133 55'517 0 TS DVICTAL
 0134 RFF 5 LAST 724 36,2134 55'517 0 TS DVICTAL +1
 0135 RFF 187 LAST 718 36,2135 0 4616 1 TC BANKCALL F40ALTC MUST BE BANKCALLED EVEN FROM ITS
 0136 RFF 1 36,2136 73707 1 CADR P41AUTO OWN BANK TO SET UP RETURN PROPERLY

0141 36,2137 0 0006 1 P*NRB*B* EXTEND
 0142 RFF 21 LAST 717 36,2140 3 1442 1 LCA TIG STORE NOMINAL TIG FOR DELATENESS COMP.
 0143 RFF 2 LAST 148 36,2141 53'512 1 EXCF GCPLTIME AND FOR P70 OR P71.

0173 36,2142 0 0004 0 INHINT
 0174 RFF 24 LAST 758 36,2143 0 4674 0 TC IBKCALL
 0175 RFF 1 36,2144 75570 1 CADR ENGINEF3
 0176 36,2145 0 0003 1 RELINT

0179 RFF 6 LAST 724 36,2146 51'455 1 INDEX WHICH
 0180 36,2147 1 0005 0 TCF 5

0182 RFF 2 LAST 723 36,2150 P42SFCT = P40SFCT (5)
 0183 RFF 2 LAST 724 36,2151 P12SFCT = P41SFCT (5)
 0185 RFF 2 LAST 724 36,2153 P62SFCT = P41SFCT (5)
 0186 RFF 1 36,2154 4 4762 1 P41SFCT CS CANTONDEX (5) IN P63 CLCKTASK ALREADY GOING

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01661	REF	188	LAST	725	36,2151	0 4610 1	TC	BANKCALL	PLST RE BANKCALLED FOR GENERALIZED
01662	REF	1			36,2152	74570 0	CACP	STCLCK2	RETURN
0167	REF	57	LAST	717	36,2153	0 6042 1	P41SPCT	INTPET	(5)
01671					36,2154	45345 1	CLOAD	DSL	
0168	REF	21	LAST	725	36,2155	13442 0		TIG	
0169	REF	1			36,2156	35147 0		029.9SEC	
01691	REF	47	LAST	714	36,2157	34741 0	STCALL	TDFC1	
01692	REF	1			36,2160	61071 0		INITCCW	
0190					36,2161	45014 0	BOFF	CALL	
0191	REF	3	LAST	716	36,2162	13347 1		MUNFLAG	
0192	REF	1			36,2163	74202 1		GCMICAV	
0193	REF	5	LAST	704	36,2164	27344 1		CSMPREC	
0194					36,2165	64375 1	VLCAD	XXV	
0195	REF	12	LAST	710	36,2166	11125 1		VATT1	
0196	REF	20	LAST	707	36,2167	01734 0		REFSMAT	
0197					36,2170	77762 1	VSR1		
0198	REF	3	LAST	716	36,2171	25726 0	STCVL	V(CSM)	CSM VELOCITY - M/CS*2(7)
0199	REF	5	LAST	710	36,2172	10017 1		RATT1	
0200					36,2173	64212 0	VSL4	XXV	
0201	REF	21	LAST	726	36,2174	11734 0		REFSMAT	
0202	REF	2	LAST	706	36,2175	35720 1	STCALL	R(CSM)	CSM POSITION - M*2(24)
0203	REF	1			36,2176	67067 1		MLNGRAV	
0204	REF	2	LAST	121	36,2177	16417 0	STODL	G(CSM)	CSM GRAVITY VEC. - M/CS*2(7)
02042	REF	14	LAST	710	36,2210	90015 0		TAT	
02044	REF	41	LAST	726	36,2211	10041 1	STGRE	TDFC1	RELOC TDFC1 FOR MIDTCAV.
0205					36,2212	71624 1	GCMICAV		
0206	REF	1			36,2213	27555 1		MIDTCAV	
0207	REF	1			36,2214	1 2213 1	TCF	CALLT-35	MADE IT IN TIME.
0208					36,2215	0 0006 1	EXTEND		
0209	REF	3	LAST	196	36,2216	3 1561 1	DCA	PIPTIME1	TIG WAS SLIPPED, SO RESET TIG TO 29.6
0210	REF	22	LAST	726	36,2217	531442 0	EXCH	TIG	SECONDS AFTER THE TIME TO WHICH WE C/D
0211					36,2218	0 0006 1	EXTEND		INTEGRATE.
0212	REF	2	LAST	726	36,2211	3 3147 0	DCA	029.9SEC	
0213	REF	23	LAST	726	36,2212	211442 0	CAS	TIG	
0214	REF	252	LAST	721	36,2213	52 155 1	CALLT-35	EXCH	MPAC
0215	REF	5	LAST	241	36,2214	531511 1		EXCH	SAVLT-30
0216					36,2215	0 0006 1		EXTEND	DELTA-T UNTIL TIG-30
0217	REF	1			36,2216	4 3762 0	DCS	5SECDP	
0218	REF	6	LAST	726	36,2217	211511 1	CAS	SAVLT-30	DELTA-T UNTIL TIG-35
0219					36,2218	0 0006 1		EXTEND	
0220	REF	7	LAST	726	36,2221	3 1500 0	DCA	SAVLT-30	
0221	REF	3	LAST	513	36,2222	0 5277 0	TC	LONGCALL	
0222	REF	17	LAST	557	17,1453		EBANK=	TTCG	
0223	REF	3	LAST	241	36,2223	02242 1	2CADR	TIG-35	
0223					36,2224	74167 0			
0224	REF	29	LAST	726	36,2225	5253 1	TC	PHASCHNG	
0225					36,2226	21254 0	DCT	20254	4.25SPCT FOR TIG-35 PRESTART.

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0226	REF	1		36,2227	0 5221 1	TC	CHECKMM	
0227				36,2230	0 5177 1	DEC	63	
0228	REF	107	LAST	715	36,2231	1 5155 1	TCF	ENDCFJCB
0229	REF	2	LAST	725	36,2232	4 4762 1	CS	CNTINDEX
0230	REF	5	LAST	681	36,2233	55 162 1	TS	DISPCFX
0231	REF	98	LAST	726	36,2234	0 6042 1	TC	INTERPT
0232					36,2235	51575 1	VLQAD	ABVAL
0233	REF	2	LAST	148	36,2236	03553 1		VNI
0234	REF	4	LAST	316	36,2237	0 3472 0	STORE	ABVEL
0235					36,2240	77776 1	EXIT	
0236	REF	108	LAST	727	36,2241	1 5155 1	TCF	ENDCFJCB

ACT P63

P63 CAN START DISPLAYING NOW.

INITIALIZE ABVEL FOR P63 DISPLAY

R0237

0238	REF	1		36,2242	3 3762 1	TIG-35	CAF	5SEC	
0239	REF	5	LAST	521	36,2243	0 5173 1	TC	TWIDLE	
0240	REF	2	LAST	241	36,2244	02311 0	ADRES	TIG-30	
0241	REF	20	LAST	726	36,2245	0 5353 1	TC	PHASCFNG	
0242					36,2246	40154 0	OCT	47154	4.155FCT FOR TIG-31 RESTART
0243	REF	1		36,2247	4 4752 1		CS	BLANKCFX	BLANK CSKY FOR 5 SECONDS
0244	REF	6	LAST	727	36,2250	55 162 1	TS	DISPCFX	
0245	REF	7	LAST	725	36,2251	51 455 1	INDEX	WHICH	
0246					36,2252	4 0005 0	CS	6	CHECK ULLAGE TIME.
0247					36,2253	0 0006 1	EXTEND		
0248	REF	40	LAST	725	36,2254	6 5261 1	EZMF	TASKOVER	
0249	REF	1			36,2255	3 3151 1	CAF	4.9SEC	SET UP TASK TO RESTORE DISPLAY AT TIG-20
0250	REF	10	LAST	727	36,2256	0 5173 1	TC	TWIDLE	
0251	REF	1			36,2257	02270 0	ADRES	TIG-30.1	
0252	REF	1		36,2260	3 5227 1		CAF	PRIO17	A NEGATIVE ULLAGE TIME INDICATES P41, IN
0253	REF	16	LAST	716	36,2261	0 5272 1	TC	NOVAC	WHICH CASE WE HAVE TO SET UP A JOB TO
0254	REF	18	LAST	726	57,1453		EBANK=	TIDGC	BLANK THE CSKY FOR FIVE SECONDS, SINCE
0255	REF	1		36,2262	02265 1		2CADP	P41BLANK	CLOCKJCB IS NOT RUNNING DURING P41.
0256	REF	1		36,2263	74067 0				
0256	REF	41	LAST	727	36,2264	1 5261 0	TCF	TASKOVER	
0257	REF	189	LAST	726	36,2265	0 4616 1	P41BLANK	TC	BLANK CSKY.
0258	REF	1		36,2266	20457 0		CADR	CLEARCSP	
0259	REF	109	LAST	727	36,2267	1 5155 1	TCF	ENDCFJCB	
0260	REF	2	LAST	727	36,2270	3 5227 1	TIG-30.1	CAF	PRIO17
0261	REF	17	LAST	727	36,2271	0 5272 1	TC	NOVAC	SET UP JOB TO RESTORE DISPLAY AT TIG-30
0262	REF	10	LAST	727	57,1453		EBANK=	TIDGC	
0263	REF	1		36,2272	02275 0		2CADP	TIG-30.1	
0263	REF	1		36,2273	74067 0				
0264	REF	42	LAST	727	36,2274	1 5261 0	TCF	TASKOVER	

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0265	REF	1		36,2275	2 2765 0	TIG-3CA	CAF	V16N85B	
0266	REF	19	LAST	727	36,2276	0 4615 1	TC	RANKCALL	RESTORE DISPLAY.
0267	REF	1		36,2277	2 1466 1		CDCR	REGDCSP	REGDCSP DOES A TCF ENDCFJOB

R0268

0269	REF	1		36,2310	3 3150 0	TIG-20	CAF	S24.9SEC	
0270	REF	11	LAST	727	36,2311	0 5173 1	TC	TWIDLE	
0271	REF	3	LAST	241	36,2312	02354 1	ADRES	TIG-5	
0272	REF	3	LAST	727	36,2313	4 4762 1	CS	CNTDINDEX	START UP CLCKTASK AGAIN
0273	REF	7	LAST	727	36,2314	55162 1	TS	DISPDEX	
0274	REF	8	LAST	727	36,2315	511455 1	INDEX	WHICH	PICK UP APPROPRIATE ULLAGE-CN TIME
0275					36,2316	2 0006 1	CAF	6	
0276					36,2317	2 0006 1	EXTEND		
0277	REF	5	LAST	725	36,2318	6 2327 0	BZMF	ULLGNOT	DON'T SET UP ULLAGE IF DT IS NEG OR ZERO
0278	REF	9	LAST	726	36,2319	551477 0	TS	SAVET-30	SAVE DELTA-T FOR RESTART
0279	REF	12	LAST	728	36,2312	0 5173 1	TC	TWIDLE	
0280	REF	2	LAST	235	36,2313	02350 0	ADRES	ULLGTASK	
0281	REF	22	LAST	716	36,2314	2 6250 0	CA	THREE	RESTART PROTECT ULLGTASK (1.3SPCT)
0282	REF	101	LAST	716	36,2315	54 001 1	TS	L	
0283	REF	23	LAST	728	36,2316	4 6250 1	CS	THREE	
0284	REF	3	LAST	217	36,2317	52 752 0	DXCH	-PHASE1	
0285	REF	5	LAST	368	36,2320	4 0025 1	CS	TIME1	
0286	REF	1			36,2321	551652 0	TS	TEASE1	
02861	REF	9	LAST	728	36,2322	511455 1	INDEX	WHICH	
02862					36,2323	1 0011 1	TCF	1	
02863	REF	11	LAST	296	36,2324	4 0116 1	WANTAPS	CS	FLGWPRD1
02864	REF	7	LAST	296	36,2325	7 4737 1	MASK	APSFLBIT	(1) FOR F42 ENSURE APSFLAC IS SET. IF IT
02865	REF	12	LAST	728	36,2326	26 106 1	ADS	FLGWRC1	WASN'T SET, DAP WILL BE INITIALIZED TO
									ASCENT VALUES BY 1/ACCS IN 2 SECONDS.
0287					36,2327	0 0006 1	ULLGNOT	EXTEND	(1)
0288	REF	10	LAST	728	36,2330	5 1455 1	INDEX	WHICH	
0289					36,2331	3 0010 0	CA	7	LOAD AVECEXIT WITH APPROPRIATE ZCADR
0290	REF	3	LAST	105	36,2332	531252 1	EXCH	AVECEXIT	
0291	REF	40	LAST	713	36,2333	2 4752 0	CAF	TWO	4.2SPCT RESTARTS IMMEDIATELY AT RFDC4.2
0292	REF	102	LAST	728	36,2334	54 001 1	TS	L	
0293	REF	41	LAST	728	36,2335	4 4752 1	CS	TWO	AND ALSO AT TIG-5 AT THE CORRECT TIME.
0294	REF	3	LAST	225	36,2336	52 761 1	EXCH	-PHASE4	
0295	REF	6	LAST	728	36,2337	4 0025 1	CS	TIME1	
0296	REF	2	LAST	234	36,2340	551660 1	TS	TEASE4	SET TEASE4 FOR TIG-5 RESTART
02961					36,2341	0 0006 1	RFDC2.17	EXTEND	

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02962	REF	13	LAST	538	36,2342	3 4755 1	CCA	NFC	CLEAR CUT GROUP 2 SO LAMBERT CAN START
02963	REF	4	LAST	232	36,2342	52 754 0	EXCH	-PHASE2	IF NEEDED.
02967	REF	1			36,2344	10 762 0	CCS	PHASE5	IS SERVICER GOING?
02968	REF	43	LAST	727	36,2346	1 5261 0	TCF	TASKOVER	YES, CAN'T START IT UP AGAIN.
02969	REF	40	LAST	614	36,2346	0 4635 0	TC	POSTJUMP	
03100	REF	1			36,2347	77410 1	CADR	PPEREAD	PPEREAD ENDS THIS TASK

R0311

03102	REF	1			36,2350	0 2663 0	ULLGTASK	TC	CALLAGE	THIS COMES AT TIC-7.5 OR TIC-3.5
03103	REF	31	LAST	727	36,2351	0 5353 1	TC	PHASCHNE		
03104					36,2352	100 1 0	OCT	1		
03105	REF	44	LAST	729	36,2353	1 5261 0	TCF	TASKOVER		

R0316

03107					36,2354	0 0116 1	TIC-5	EXTEND		
03172	REF	11	LAST	729	36,2355	3 4755 1	CCA	NFC	INSURE THAT GROUP 3 IS INACTIVE.	
03174	REF	2	LAST	215	36,2356	52 754 1	EXCH	-PHASE3		
03176	REF	2	LAST	727	36,2357	3 3762 1	CAF	5SEC		
0318	REF	13	LAST	728	36,2358	0 5173 1	TC	TWIDCLE		
0319	REF	2	LAST	241	36,2361	2457 0	ADRES	TIC-1		
0310	REF	65	LAST	632	36,2362	0 5516 0	TC	DOWNFLAG	RESET IGNFLAG AND ASTAFLAG	
0311	REF	1			36,2363	0 0153 0	ADRES	IGNFLAG	FOR LIGHT-UP LCCIC	
0312	REF	66	LAST	729	36,2364	0 5516 0	TC	DOWNFLAG		
0313	REF	1			36,2365	0 0154 1	ADRES	ASTAFLAG		
0314	REF	67	LAST	729	36,2366	0 5516 0	TC	DOWNFLAG		
0315	REF	1			36,2367	0 0122 0	ADRES	ZCCMFLAG		
0318	REF	11	LAST	728	36,2370	51455 1	INDEX	WHICH		
0319					36,2371	1 0311 0	TCF	11		
0320	REF	1			36,2372	10 756 1	P40S JUNK	CCS	PHASE3	(11) P40 AND P42. S40.13 IN PROGRESS?
03202	REF	4	LAST	725	36,2373	1 2452 1	TCF	DISPCFNG	YES	
03204	REF	4	LAST	385	36,2374	3 4736 1	CAF	PRIC21		
0321	REF	27	LAST	717	36,2375	0 5105 0	TC	FINDVAC		
0322	REF	20	LAST	727	36,2376	0 0153 1	EBANK=	TTCOC		
0323	REF	2	LAST	240	36,2376	0 2540 1	2CADR	S40.13		
0323					36,2377	56367 0				
03232	REF	32	LAST	729	36,2400	0 5353 1	TC	PHASCHNE	3.5SPCT FOR S40.13	
03234					36,2401	0 0353 1	OCT	00153		

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0324	REF	1		36,2412	4 4760 0	DISPATCH	CS	VB99DFX	(11)
0325	REF	8	LAST	728	36,2413	55162 1	TS	DISDFX	
03252	REF	23	LAST	729	36,2414	0 5353 1	COMMON	TC	PHASCENG
03254					36,2415	40074 0	CCT	40074	RESTART TIG-C (4.75PCT)
0326	REF	45	LAST	729	36,2416	1 5261 0	TCF	TASKOVER	

R0327

0328	REF	6	LAST	724	36,2417	4 0103 1	TIG-C	CS	FLAGWRD7	SET IGNFLAG SINCE TIG HAS ARRIVED
0329	REF	1			36,2418	7 4737 1		MASK	IGNFLBIT	
0330	REF	7	LAST	730	36,2411	26 103 1		ADS	FLAGWRD7	

0331	REF	2	LAST	727	36,2412	0 5321 1		TC	CHECKVM	IN P63 CASE, THROTTLE-UP IS ZOOMTIME
0332					36,2413	00177 1		CHC	63	AFTER NOMINAL IGNITION, ACT ACTUAL

0333	REF	1			36,2414	1 2425 1		TCF	IGNYFT?	
0334	REF	2	LAST	240	36,2415	3 1422 1		CA	ZOOMTIME	
0335	REF	32	LAST	716	36,2416	0 5213 0		TC	WAITLIST	

0336	REF	21	LAST	243	36,2417	0 3667 0		EBANK=	DVCNTP	
03365	REF	2	LAST	247	36,2417	0 3667 0		ZCADR	ZOOM	
03365					36,2420	72567 0				

0337	REF	4	LAST	653	36,2421	0 5327 1		TC	2PHSCHNG	
0338					36,2422	40033 0		CCT	40033	

0339					36,2423	05014 1		CCT	05014	
0340					36,2424	77777 0		OCT	77777	

0341	REF	1			36,2425	3 4740 0	IGNYFT?	CAF	ASTNFT	CHECK ASTNFLAG: HAS ASTRONAUT RESPONDED
0342	REF	8	LAST	730	36,2426	7 0103 1		MASK	FLAGWRD7	TO CUR ENGINE ENABLE REQUEST?
0343					36,2427	0 0006 1		EXTEND		

0344	REF	12	LAST	729	36,2430	5 1455 1		INDEX	WHICH	
0345					36,2431	1 0112 0		RZF	12	BRANCH IF HE HAS NOT RESPONDED YET

0346	REF	15	LAST	619	36,2432	4 0101 0	IGNITION	CS	FLAGWRD5	INSURE ENGONFLG IS SET.
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03461	REF	3	LAST	217	36,2433	7 4745 1		MASK	ENGONBIT	
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03462	REF	20	LAST	730	36,2434	26 101 0		ADS	FLAGWRD5	
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03463	REF	6	LAST	257	36,2435	4 4355 1		CS	PRIC30	TURN ON THE ENGINE.
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0347					36,2436	0 0006 1		EXTEND		
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0348	REF	22	LAST	472	36,2437	02 011 0		RAND	DSALMCUT	
------	-----	----	------	-----	---------	----------	--	------	----------	--

0349	REF	27	LAST	566	36,2440	6 4737 0		AD	RIT13	
------	-----	----	------	-----	---------	----------	--	----	-------	--

0350					36,2441	0 0006 1		EXTEND		
------	--	--	--	--	---------	----------	--	--------	--	--

0351	REF	23	LAST	730	36,2442	01 011 0		WRITE	DSALMCUT	
------	-----	----	------	-----	---------	----------	--	-------	----------	--

0352					36,2443	0 0006 1		EXTEND		SET TEVENT FOR DOWNLINK
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0353	REF	17	LAST	600	36,2444	3 0025 0		ICA	TIME2	
------	-----	----	------	-----	---------	----------	--	-----	-------	--

0354	REF	4	LAST	201	36,2445	531342 1		EXCH	TEVENT	
------	-----	---	------	-----	---------	----------	--	------	--------	--

03542	REF	1			36,2446	4 4735 0		CS	PULSES	MAKE SURE THAT CAP IS ACT IN MINIMUM
03544	REF	12	LAST	206	36,2447	7 0111 1		MASK	DAPEFCLS	IMPULSE MODE IN P12,P40,P42,AND P63

03546	REF	13	LAST	730	36,2450	54 111 1		TS	DAPEFCLS	
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0356	REF	4	LAST	241	36,2451	0 0006 1	EXTEND		UPDATE TIC USING TGC FROM S40.13
0357	REF	24	LAST	726	36,2452	3 1517 0	CCA	TGC	
0358					36,2453	53'442 1	DXCH	TIG	
0359	REF	18	LAST	730	36,2454	0 0016 1	EXTEND		
0360	REF	25	LAST	731	36,2455	3 0025 0	CCA	TIME2	
					36,2456	21'442 0	CAS	TIG	
0361	REF	1			36,2457	4 4742 0	CS	FLUNCHIT	PERMIT GUIDANCE LOOP DISPLAYS
0362	REF	11	LAST	704	36,2460	7 0104 0	MASK	FLAGWPD8	
0363	REF	11	LAST	731	36,2461	54 1134 0	TS	FLAGWPD8	
0364	REF	12	LAST	730	36,2462	51'455 1	INDEX	WHICH	
0365					36,2463	1 0013 1	TCF	13	
0366					36,2464	0 0016 1	P63IGN	EXTEND	(13) INITIATE BURN DISPLAYS
0367	REF	1			36,2465	3 2142 1	CCA	LUNLANAD	
0368	REF	1			36,2466	53'252 1	DXCH	AVGEXIT	
0369	REF	15	LAST	681	36,2467	3 0005 1	CA	2	ASSASSINATE CLOKTASK
0370	REF	9	LAST	730	36,2470	55'162 1	TS	DISPDEX	
0371	REF	1			36,2471	4 0105 1	CS	FLAGWRD5	SET FLAG FOR P70-P71
0372	REF	1			36,2472	7 4743 1	MASK	IFTABBIT	
0373	REF	2	LAST	731	36,2473	26 105 1	ADS	FLAGWRD6	
0374	REF	9	LAST	730	36,2474	4 0103 1	CS	FLAGWRD7	SET SWANDISP TO FAARIE RIC.
0375	REF	1			36,2475	7 4741 0	MASK	SWANCHIT	
0376	REF	10	LAST	731	36,2476	26 113 1	ADS	FLAGWRD7	
0377					36,2477	0 0006 1	EXTEND		INITIALIZE TIC FOR P70 AND P71.
0378	REF	19	LAST	731	36,2500	3 0025 0	CCA	TIME2	
0379	REF	26	LAST	731	36,2501	53'442 0	DXCH	TIG	
0380	REF	122	LAST	725	36,2502	3 4755 1	CAF	ZERO	INITIALIZE WCHPHASE AND FLPASS0
0381	REF	1			36,2503	55'346 0	TS	WCHPHASE	
0382	REF	2	LAST	150	36,2504	55'621 1	TS	WCHPHOLD	ALSO WCHPHOLD
0383	REF	42	LAST	728	36,2505	3 4752 0	CA	TWC	
0384	REF	2	LAST	150	36,2506	55'623 0	TS	FLPASS0	
0385					36,2507	1 2545 0	TCF	P42IGN	
0386	REF	21	LAST	730	36,2510	4 0101 1	CS	FLAGWRD5	(13)
0387	REF	1			36,2511	7 4743 1	MASK	NCTHPEIT	
0388					36,2512	0 0006 1	EXTEND		
0389	REF	3	LAST	731	36,2513	1 2545 0	BZF	P42IGN	
0390	REF	3	LAST	730	36,2514	3 1422 1	CA	ZCCMIME	
0391	REF	33	LAST	730	36,2515	0 5203 0	TC	WAITLIST	
0392	REF	22	LAST	730	7,1515		EBANK=	DVONTR	
0393	REF	2	LAST	730	36,2516	03667 0	ZCADF	ZCCM	
0394					36,2517	72067 0			
0395	REF	5	LAST	730	36,2520	0 5327 1	P63IGN1	TC	2PHSCFNC

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E7 S2

0399					36,2521	40133		CCT	40133	3.3 SPCT FOR ZCCN RESTART.
0390					36,2522	05014	1	CCT	05014	TYPE C RESTARTS HERE IMMEDIATELY
0391					36,2523	77777	0	CCT	77777	
0392	REF	4	LAST	731	36,2524	1 2545	0	TCF	P42IGN	
0398	REF	6	LAST	522	36,2525	3 5015	0	CAF	EBANK6	
039805	REF	21	LAST	712	36,2526	54 723	0	TS	EBANK	
03981	REF	7	LAST	223	56,1537			EBANK=	ACSQ	
039814	REF	1			36,2527	3 1412	1	CA	ICNACSQ	INITIALIZE CAP BIAS ACCELERATION
039815	REF	9	LAST	732	36,2530	55 537	0	TS	ACSQ	ESTIMATES AT P12 IGNITION.
03982	REF	1			36,2531	3 1413	0	CA	ICNACSQ	
039825	REF	1			36,2532	55 541	1	TS	ACSR	
03983	REF	4	LAST	678	36,2533	3 5016	0	CAF	EBANK7	
039835	REF	22	LAST	732	36,2534	54 003	0	TS	EBANK	
03984	REF	23	LAST	731	57,1515			EBANK=	DVCMTR	
0399	REF	16	LAST	731	36,2535	3 0005	1	CA	Z	(12) KILL CLKCTASK
0400	REF	10	LAST	731	36,2536	55 162	1	TS	DISPDEX	
04001					36,2537	0 0005	1	EXTEND		CONNECT ASCENT GUIDANCE TO SERVICER.
04002	REF	1			36,2540	3 3145	1	CCA	ATMAGADR	
04003	REF	2	LAST	731	36,2541	53 252	1	EXCH	AVCEXIT	
0401	REF	11	LAST	731	36,2542	4 0103	1	CS	FLAGWRD7	ENABLE F10.
0402	REF	2	LAST	731	36,2543	7 4741	0	MASK	SWANBIT	
0403	REF	12	LAST	732	36,2544	26 102	1	ADS	FLAGWRD7	
0405	REF	1			36,2545	4 4744	0	P42IGN	CS	ENSURE THAT POWERED-FLIGHT SWITCHING
0409	REF	14	LAST	730	36,2546	7 0111	1	MASK	DAPBCCLS	CURVES ARE USED.
0410	REF	15	LAST	732	36,2547	54 111	1	TS	DAPBCCLS	
0411	REF	1			36,2550	3 4743	0	CAF	INPLBIT	EXAMINE IMPULSE SWITCH
0412	REF	18	LAST	691	36,2551	7 0076	1	MASK	FLAGWRD2	
0413	REF	221	LAST	716	36,2552	10 000	0	CCS	A	
0414	REF	1			36,2553	1 2526	1	TCF	INPLBURN	
0415	REF	68	LAST	729	36,2554	0 5516	0	DVCMONCON	TC	DOWNFLAG
0416	REF	2	LAST	729	36,2555	0 0153	0	ADRES	IGNFLAG	CONNECT DVCMON
0417	REF	65	LAST	732	36,2556	0 5516	0	TC	DOWNFLAG	
0418	REF	2	LAST	729	36,2557	0 0154	1	ADRES	ASTNFLAG	
0419	REF	70	LAST	732	36,2560	0 5516	0	TC	DOWNFLAG	
0420	REF	1			36,2561	0 0161	1	ADRES	ICLFFLAG	
0421	REF	34	LAST	730	36,2562	0 5353	1	TC	PHASCHNG	
0422					36,2563	40054	1	CCT	40054	
0423	REF	11	LAST	703	36,2564	1 5221	0	TC	FIXDELAY	TURN ULLAGE OFF HALF A SECOND AFTER
0424					36,2565	00 062	1	DEC	50	LIGHT UP.

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0425 RFF 1 36,2566 0 2557 1 ULLAGEFF TC NCULLAGE

0426 36,2567 0 0006 1 WAITABIT EXTEND KILL GROUP 4

0427 RFF 12 LAST 720 36,2570 3 4755 1 DCA NEG0

0428 RFF 4 LAST 728 36,2571 52 760 1 EXCF -PHASE4

0429 RFF 46 LAST 730 36,2572 1 5261 0 TCF TASKOVER

04292 RFF 41 LAST 729 36,2573 0 4635 0 TICTASK TC PCSTJUMP (12)

04293 RFF 1 36,2574 73656 0 TICTASK1 CADR TICTASK1

R1430 *****

0432 31,2144 BANK 31

0433 RFF 1 35,2200 SFTLCC P40S3

0434 35,3656 BANK

0435 RFF 1 COUNT# 14/P40

0431 RFF 6 LAST 472 35,3656 3 5026 0 TICTASK1 CAF PRIC16

0432 RFF 18 LAST 727 35,3657 7 5072 1 TC ACVAC

0433 RFF 6 LAST 605 37,1462 EBANK= TRMKKENT

0434 RFF 1 35,3660 02245 1 2CADR TIGNCK

0434 RFF 1 35,3661 74067 0

04342 RFF 71 LAST 732 35,3662 0 5516 0 TC DOWNFLAG

04344 RFF 3 LAST 286 35,3663 02223 1 ADRES PULSFFIG

0435 RFF 35 LAST 732 35,3664 0 5353 1 TC PHASCHNG

0436 35,3665 00006 1 CCT 6 KILL GROUP 6.

0437 RFF 47 LAST 733 35,3666 1 5261 0 TCF TASKOVER

R1434 *****

0439 RFF 3 LAST 730 35,3667 0 5221 1 ZOOM TC CHECKMM P40 CF P63?

0440 35,3670 01077 1 DFC 63

0441 RFF 1 35,3671 1 3677 0 TCF P40ZCFM

0442 RFF 45 LAST 711 35,3672 0 5514 0 P63ZOOM TC UPFLAG INDICATE THAT THRUSTLE-UP HAS COME

0443 RFF 2 LAST 725 35,3673 00122 0 ACRES ZOOMFLAG

0445 RFF 25 LAST 725 35,3674 0 4674 1 TC IBKCALL

0446 RFF 1 35,3675 52316 1 CADR FLATOLT

04462 RFF 1 35,3675 1 3714 0 TCF P40ZCMA

04463 RFF 28 LAST 730 35,3677 3 4737 0 P40ZOOM CAF BIT13

04464 RFF 2 LAST 712 35,3700 54 755 0 TS THRUST

04465 RFF 30 LAST 713 35,3701 3 4750 1 CAF BIT4

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F7 S3

04466					35,3702	0 0016 1		EXTEND	
04467	REF	8	LAST	738	35,3703	05 014 1		WCF	CFAN14
0447	REF	36	LAST	733	35,3704	0 5353 1	P40ZCCMA	TC	PHASCHNG
0448					35,3705	00113 1		CCT	3
0449	REF	48	LAST	732	35,3706	1 5261 0		TCF	TASKCVFR

04493					36,2575			BANK	36
04494	REF	4	LAST	723	36,2600			SFILCC	P415
04495					36,2575			BANK	
04496	REF	4	LAST	723 TO	733:	261 381*		CCUNT*	\$/P41

P0450

0451	REF	46	LAST	733	36,2575	0 5504 0	CCMFAIL	TC	UPELAG	(15)
0452	REF	2	LAST	732	36,2576	00161 1		ADRES	IDLEFLAG	
0453	REF	47	LAST	734	36,2577	0 5504 0		TC	UPELAG	SET FLAG TO SUPPRESS CONFLICTING DISPLAY
0454	REF	1			36,2600	00175 1		ADRES	FLUNCISP	
0455	REF	10	LAST	445	36,2611	2 4751 0		CAF	FLCLR	RESET EVNCR
0456	REF	24	LAST	732	36,2612	551515 0		TS	CVCNTR	
0457	REF	1			36,2603	10 764 0		CCS	PHASE6	CLOCKTASK ACTIVE?
0458					36,2604	1 2607 0		TCF	+3	YES
0460	REF	191	LAST	728	36,2605	0 4616 1		TC	RANKCALL	OTHERWISE, START IT UP
0461	REF	1			36,2606	74667 0		CACR	STCLOCK1	
0462	REF	1			36,2607	4 4765 0	+3	CS	VEP07DEX	
0463	REF	11	LAST	732	36,2610	551162 1		TS	DISPDEX	
0464	REF	37	LAST	734	36,2611	0 5353 1		TC	PHASCHNG	TURN OFF GROUP 4.
0465					36,2612	00004 0		CCT	00004	
04655	REF	110	LAST	727	36,2613	1 5155 1		TCF	ENDOFJCB	

0466	REF	14	LAST	731	36,2614	511455 1	CCMFAIL1	INDEX	WHICH
0467					36,2615	1 0002 1		TCF	2

0468	REF	17	LAST	732	36,2616	3 0015 1	CCMFAIL2	CA	Z	(15)	KILL CLKTASK USING 2
0469					36,2617	1 2621 1		TCF	+2		

0470	REF	4	LAST	728	36,2620	4 4762 1	CCMFAIL4	CS	CNTDNDX
0471	REF	12	LAST	734	36,2621	551162 1		TS	DISPDEX

0472	REF	72	LAST	732	36,2622	0 5516 0		TC	DCWNFLAG	RECONNECT EV MONITOR
0473	REF	3	LAST	734	36,2623	00161 1		ADRES	IDLEFLAG	
0474	REF	73	LAST	734	36,2624	0 5516 0		TC	DCWNFLAG	PERMIT ELICANCE LOOP DISPLAYS
0475	REF	2	LAST	734	36,2625	00175 1		ADRES	FLUNCISP	
0476	REF	111	LAST	734	36,2626	1 5155 1		TCF	ENDOFJCB	

0477	REF	38	LAST	734	36,2627	0 5353 1	CCMFAIL2	TC	PHASCHNG	KILL ZOOM RESTART PROTECTION
0478					36,2631	0 0013 1		CCT	00013	

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0479				26,2631	0 004 0	ININT		
0481	REF	1	LAST	596	36,2632	0 622 0	TC	KILLTASK KILL ZCCM, IN CASE IT'S STILL TO CCMF
0481	REF	4	LAST	731	36,2633	73567 1	CACR	ZCCM
0482	REF	26	LAST	732	36,2634	0 4674 0	TC	IEKCALL COMMAND ENGINE CFF
0483	REF	1			36,2635	75565 0	CACR	ENGINE4
04832	REF	48	LAST	734	36,2636	0 5504 0	TC	UPFLAG SET THE DRIFT BIT FOR THE DAP.
04834	REF	1			36,2637	0 0312 1	ADRES	DRIFTDFL
0484	REF	1			36,2640	1 2651 1	TC	INVFLAG USE OTHER RCS SYSTEM
0485	REF	1			36,2641	0 0010 0	ADRES	ACCEPTFLG
0486	REF	49	LAST	735	36,2642	0 55 4 0	TC	UPFLAG TURN ON ULLAGE
0487	REF	2	LAST	225	36,2643	0 3314 1	ADRES	ULLAGFLG
0489	REF	35	LAST	715	36,2644	3 4753 1	CACR	BIT1
0489					36,2645	0 0014 0	ININT	
0489	REF	14	LAST	725	36,2646	0 5173 1	TC	TWIDDLE
0491	REF	4	LAST	728	36,2647	0 2354 1	ADRES	TIC-5
0492	REF	112	LAST	734	36,2650	1 5155 1	TCF	ENDOFJOB

R0493 *****
 R0494 SUBROUTINES OF THE IGNITION ROUTINE
 R0495 *****

0496	REF	191	LAST	683	36,2651	3 0052 0	INVFLAG	CA 0
0497	REF	1			36,2652	0 5522 1	TC	DERIT
0498					36,2653	0 0000 0	CCM	
0499					36,2654	0 0016 1	EXTEND	
0500	REF	14	LAST	550	36,2655	0 6 001 0	RXCR	LCHAN
0501	REF	1			36,2656	1 5511 0	TCF	CCMFLAG

R0502 *****

0503	REF	1			36,2657	4 4746 1	NULLAGE	CS ULLAGER MUST BE CALLED IN A TASK OR UNDER INHINT
0504	REF	16	LAST	732	36,2658	7 0111 1	MASK	DAPBCCLS
0505	REF	17	LAST	735	36,2661	54 111 1	TS	DAPBCCLS
0506	REF	192	LAST	735	36,2662	0 0002 0	TC	G

R0507 *****

0508	REF	18	LAST	735	36,2663	4 0111 1	NULLAGE	CS DAPBCCLS TURN ON ULLAGE. MUST BE CALLED IN
0509	REF	2	LAST	735	36,2664	7 4746 1	MASK	ULLAGER A TASK OR WHILE INHINTED.
0510	REF	19	LAST	735	36,2665	26 111 1	ADS	DAPBCCLS
0511	REF	192	LAST	735	36,2666	0 0002 0	TC	G

R0512 *****

0513	REF	134	LAST	731	36,2667	3 4755 1	STCLCK1	CA ZERR THIS ROUTINE STARTS THE COUNT-DOWN
0514	REF	13	LAST	734	36,2670	55 1162 1	STCLCK2	TS DISPCFX (CLCKTASK AND CLCKJCF). SETTING

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0516	REF	9	LAST	576	36,2671	0 4645	1	STCLOCK3	TC	MAKECADR	SETTING DISPDIX POSITIVE KILLS IT.
0517	REF	3	LAST	728	36,2672	55 126	1		TS	TRASE4	RETURN SAVE (ACT FOR RESTARTS)
0517					36,2673	0 0006	1			EXTEND	
0518	REF	27	LAST	731	36,2674	3 1442	1		CCA	TIG	
0519	REF	293	LAST	724	36,2675	52 155	1		DXCH	MPAC	
0520					36,2676	0 0006	1			EXTEND	
0521	REF	20	LAST	731	36,2677	4 0025	1		DCS	TIME2	
0522	REF	294	LAST	734	36,2700	20 155	1		DAS	MPAC	HAVE TIC - TIME2, UNCORRECTEDLY A + NUMBER
0523	REF	7	LAST	437	36,2701	0 7262	0		TC	TEAGREF	POSITIVE, SINCE WE PASSED THE
0524	REF	12	LAST	719	36,2702	3 4777	1		CAF	1SEC	45 SECCND CHECK
0525	REF	154	LAST	735	36,2703	54 112	1		TS	Q	
0526	REF	295	LAST	736	36,2704	52 155	1		EXCH	MPAC	
0527	REF	10	LAST	563	36,2705	7 4346	0		MASK	LCW5	RESTRICT MAGNITUDE OF NUMBER IN A
0528					36,2706	0 0006	1		EXTEND		
0529	REF	195	LAST	736	36,2707	10 062	1		CV	G	
0530	REF	113	LAST	728	36,2710	3 0011	0		CA	L	GET REMAINDER
0531	REF	43	LAST	731	36,2711	6 4752	0		AC	TWC	
0532					36,2712	0 0004	0			INHINT	
0533	REF	15	LAST	735	36,2713	1 5173	1		TC	TWIDDLE	
0534	REF	2	LAST	652	36,2714	0273	0		ACFFS	CLOCKTASK	
0535	REF	6	LAST	731	36,2715	0 5227	1		TC	2FHSCHNG	
0536					36,2716	40036	0		CCT	40036	6.2SPOT FOR CLOCKTASK
0537					36,2717	05124	1		CCT	05024	
0538					36,2720	13110	0		CCT	13000	
0539	REF	4	LAST	726	36,2721	3 1161	0		CA	TRASE4	
0540	REF	12	LAST	577	36,2722	0 4640	1		TC	PANKJUMP	
0541	REF	7	LAST	728	36,2723	4 0025	1	CLOCKTASK	CS	TIME1	SET TRASE6 FOR GROUP 6 RESTART
0542	REF	1			36,2724	55 064	0		TS	TRASE6	
0543	REF	14	LAST	735	36,2725	11 162	1		CCS	DISPDIX	
0544	REF	1			36,2726	1 2737	1		TCF	KILLCLOCK	
0545					36,2727	12 730	0		ACCP		
0546	REF	3	LAST	508	36,2730	3 7721	0		CAF	PRI027	
0547	REF	19	LAST	733	36,2731	0 5072	1		TC	NOVAC	
0548	REF	21	LAST	729	36,2732	02743	0		FRANK=	TTCGC	
0549	REF	1			36,2733	74067	0		2CADR	CLOCKJCB	
0550	REF	12	LAST	732	36,2734	0 5221	0		TC	FIXDFLAY	WAIT A SECCND BEFORE STARTING OVER
0551					36,2735	00144	0		DEC	100	
0552	REF	4	LAST	726	36,2736	1 2723	1		TCF	CLOCKTASK	
0553					36,2737	0 0006	1	KILLCLOCK	EXTEND		KILL RESTART
0554	REF	12	LAST	732	36,2740	3 4755	1		CCA	NEG0	
0555	REF	2	LAST	215	36,2741	52 764	0		EXCH	-PHASE6	

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0556 PFF 49 LAST 734 36,2742 1 5261 0 TCF TASKCVFR

0557 36,2743 1 1006 1 CLOCKJCS EXTEND

0558 PFF 2P LAST 736 36,2744 4 1442 0 CCS TIC

0559 PFF 22 LAST 736 36,2745 52 454 1 EXCH TICGE

0560 36,2746 0 22 16 1 EXTEND

0561 PFF 21 LAST 736 36,2747 3 025 0 DCA TIME2

0562 PFF 23 LAST 737 36,2750 21 454 1 CAS TICGE

0563 36,2751 0 0004 0 INHINT

0564 PFF 15 LAST 736 36,2752 11 162 1 CCS DISPEX

0565 PFF 113 LAST 736 36,2753 1 5155 1 TCF ENDJOB

0566 PFF 114 LAST 737 36,2754 1 5155 1 TCF ENDJOB

0567 36,2755 4 0000 0 CCM

0568 36,2756 0 21 3 1 RELINT

0569 PFF 222 LAST 732 36,2757 50 000 1 INDEX A

0570 PFF 1 36,2760 1 2015 1 TCF DISFNCT -1

IF DISPEX HAS BEEN SET POSITIVE BY A TASK OR A HIGHER PRIORITY JOB SINCE THE LAST CLOKTASK, AVOID USING IT AS AN INDEX.

***** DISPEX MUST NEVER BE -1 *****

(-1 DUE TO EFFECT OF CCS)

0571 RFF 1 4765 VB97DEX = OCT35

NEGATIVE OF THIS IS PROPER FOR DISPEX

05711 PFF 135 LAST 736 36,2761 4 4755 0 -35 CS 75RD

INDICATE VERR 97 PASTE

05712 PFF 1 36,2762 55 166 1 TS NVWCPCD1

0572 PFF 1 36,2763 3 1371 1 CA NVWORD +2

NVWORD+2 CONTAINS V06 & APPROPRIATE NCU

0573 PFF 192 LAST 734 36,2764 0 4616 1 TC BANKCALL

0574 PFF 1 36,2765 20 474 1 CADR CLOCCLK

0575 PFF 1 36,2766 1 3117 1 TCF STOPCLK

TERMINATE CLOKTASK ON THE WAY TO POCH

0576 PFF 1 36,2767 1 2614 1 TCF CCMFALL1

0577 PFF 1 36,2770 1 2627 1 TCF CCMFALL2

A0582 THIS DISPLAY IS CALLED VIA ASTNCLK

0584 PFF 1 36,2771 3 2152 1 -25 CAF V06N61

IT IS PRIMARILY USED BY THE CREW IN P63

0585 PFF 193 LAST 727 36,2772 0 4616 1 TC BANKCALL

TO RESET HIS EVENT TIMER TO AGREE WITH

0586 PFF 1 36,2772 20 467 1 CADR REFLASH

TIC.

0587 PFF 2 LAST 737 36,2774 1 3117 0 TCF STOPCLK

0588 PFF 1 36,2775 1 3134 1 TCF ASTNRETA

0589 36,2776 1 2771 0 TCF -5

0590 RFF 1 4752 CNTNDEX = LOW4

CCT17: NEGATIVE PROPER FOR DISPEX

0591 RFF 15 LAST 734 36,2777 51 455 1 -17 INDEX WHICH

THIS DISPLAY COMES UP AT ONE SECOND

0592 36,3000 3 2010 1 CAF 0

INTERVALS. IT IS NORMALLY OPERATED

0593 RFF 104 LAST 737 36,3001 0 4616 1 TC BANKCALL

BETWEEN TIC-30 SECONDS AND TIC-5 SECONDS

0594 RFF 2 LAST 728 36,3002 20 466 1 CADR PEGGDCSP

PEGGDCSP DECS ITS OWN TCF ENDJOB

0595 RFF 2 LAST 465 4750 VB99DEX = ELEVEN

CCT113: NEGATIVE PROPER FOR DISPEX

05956 40,3 13 VSSRECYC EQUALS

05956 PFF 19 LAST 555 36,3003 4 4743 1 -13 CS BIT9

INDICATE VERR 99 PASTE

05957 PFF 2 LAST 737 36,3004 55 166 1 TS NVWCPCD1

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0596	REF	16	LAST	737	36,3015	01455 1	INDEX	WHICH	THIS IS THE "PLEASE ENABLE ENGINE"
0597					36,3016	3 175 1	CAF	0	DISPLAY: IT IS INITIATED AT 11G-5 SEC.
0598	REF	195	LAST	737	36,3017	0 4616 1	TC	BANKCALL	THE DISPLAY IS A V99NXX, WHERE XX IS THE
0599	REF	2	LAST	737	36,3019	20474 1	CADR	CLOCKPLAY	NCLN THAT HAD PREVIOUSLY BEEN DISPLAYED
0600	REF	3	LAST	737	36,3011	1 3017 0	TCF	STOPCLOCK	TERMINATE GCTOPCOH TURNS OFF ULLAGE.
0601	REF	1			36,3 12	1 3045 1	TCF	*PROCFED	
0602	REF	1			36,3013	1 3050 0	TCF	*ENTER	
0606	REF	44	LAST	736	4752		BLANKDEX =	TWO	NEGATIVE OF THIS IS PROPER FOR DISPCX
0607	REF	196	LAST	738	36,3014	0 4616 1	-2	TC	BANKCALL
0608	REF	2	LAST	727	36,3015	2 1457 0	CADR	CLEANSF	BLANK CISKY. THE CISKY IS BLANKED FOR
0609	REF	115	LAST	737	36,3016	1 5155 1	DISPACT	TCF	ENDCFJCB
									5 SECONDS AT 11G-35 TC INDICATE THAT
									AVERAGE C IS STARTING.
0610	REF	1			36,3017	0 3021 1	STOPCLOCK	TC	NULLCLOCK
0611	REF	19	LAST	711	36,3020	1 6001 1	TCF	GCTOPCOH	STOP CLOKTASK & TURN OFF ULLAGE ON THE
									WAY TO P00 (GCTOPCOH PELINTS)
0612					36,3021	0 0004 0	NULLCLOCK	INHINT	
0613					36,3022	0 0006 1		EXTEND	
0614	REF	1			36,3023	23 141 1	CXCH	P40/RET	
0615	REF	2	LAST	733	36,3024	0 2657 1	TC	NCULLAGE	TURN OFF ULLAGE...
0616	REF	11	LAST	735	36,3025	0 6032 0	TC	KILLTASK	DON'T LET IT COME ON, EITHER...
0617	REF	3	LAST	728	36,3026	74350 1	CADR	ULLGTASK	
0618	REF	39	LAST	734	36,3027	0 5353 1	TC	PHASCHNG	NCT EVEN IF THERE'S A RESTART.
0619					36,3030	0 0001 0	CCT	1	
0620	REF	19	LAST	734	36,3031	3 0005 1	CA	2	KILL CLOKTASK
0621	REF	16	LAST	737	36,3032	55 162 1	TS	DISPCX	
0622	REF	2	LAST	738	36,3033	0 1141 1	TC	P40/RET	
06222	REF	43	LAST	738	36,3034	0 5353 1	ASTNREFIN	TC	PHASCHNG
06224					36,3035	04024 0	CCT	04024	
0623	REF	136	LAST	737	36,3036	3 4755 1	CAF	ZERO	STOP DISPLAYING BUT KEEP RUNNING.
06231	REF	17	LAST	738	36,3037	55 162 1	TS	DISPCX	
06232	REF	1			36,3040	3 5023 0	CAF	PRIC13	
0625	REF	28	LAST	729	36,3041	0 5175 0	TC	FINDVAC	
0626	REF	2	LAST	125	35,1757		FBANK=	STARIND	
0627	REF	1			36,3042	03211 0	2CADR	ASTNRET	
0627	REF	1			36,3043	64765 0			
0628	REF	116	LAST	738	36,3044	1 5155 1	TCF	ENDCFJCB	
0629	REF	50	LAST	735	36,3045	0 5504 0	*PROCFED	TC	UPFLAG
0630	REF	3	LAST	732	36,3046	00154 1	ADRES	ASTNFLAG	
0631	REF	1			36,3047	1 3106 1	TCF	IGNITE	
0632					36,3050	0 0004 0	*ENTER	INHINT	

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0633 RFF 17 LAST 738 36,3051 51455 1
 0634 36,3052 1 51455 1

INDEX WHICH
 TCF 3

0635 RFF 2 LAST 212 36,3053 3 4644 0 GEPCST CAF PRI012 (3) MUST BE LOWER PRIORITY THAN CLCKJCB
 0636 RFF 29 LAST 738 36,3054 5 5145 0 TC FINDVAC
 0637 RFF 24 LAST 737 57,1453 FRANK= TIOGC
 0638 RFF 2 LAST 241 36,3055 03227 0 ZCADP POSTBURN
 0638 36,3056 74067 0
 06382 36,3057 1 5014 0 INHINT SFT UP THE CAP FOR COASTING FLIGHT.
 06383 RFF 27 LAST 738 36,3060 4 4674 0 TC IBKCALL
 06384 RFF 2 LAST 231 36,3061 4 0205 1 CADP ALLOCAST
 0639 RFF 2 LAST 738 36,3062 0 3721 1 TC NULLCLOCK
 0640 RFF 41 LAST 738 36,3063 0 5353 1 TC PHASCHNG 4.13 RESTART FOR POSTBURN
 0641 36,3064 0 0134 1 CCT 00134

0642 RFF 117 LAST 738 36,3065 1 5155 1 TCF ENDFEJCB

0643 RFF 3 LAST 727 36,3066 2 5127 1 GOCUTOFF CAF PRI017 (3)
 0644 RFF 30 LAST 738 36,3067 0 5145 0 TC FINDVAC
 0645 RFF 5 LAST 731 57,1516 FRANK= TCF
 0646 RFF 1 36,3070 02416 0 ZCADP CLTOFF
 0646 RFF 1 36,3071 3 0067 0
 0646 RFF 74 LAST 734 36,3072 1 5516 0 TC DOWNFLAG
 0650 RFF 3 LAST 734 36,3073 0 0175 1 ADRES FLUNDISP

06502 36,3074 0 00 4 0 INHINT SFT UP THE CAP FOR COASTING FLIGHT.
 06504 RFF 28 LAST 739 36,3075 0 4674 1 TC IBKCALL
 06506 RFF 3 LAST 739 36,3076 4 0205 1 CADP ALLOCAST
 0651 RFF 2 LAST 736 36,3077 0 3021 1 TC NULLCLOCK
 0652 RFF 42 LAST 730 36,3100 1 5353 1 TC PHASCHNG
 0653 36,3101 07124 0 CCT 07124
 0654 36,3102 17 00 1 CCT 17000
 0655 RFF 6 LAST 739 57,1516 FRANK= TCF
 0656 RFF 2 LAST 736 36,3103 02416 0 ZCADP CLTOFF
 0656 36,3104 3 0067 0
 0657 RFF 118 LAST 739 36,3105 1 5155 1 TCF ENDFEJCB

0658 RFF 13 LAST 722 36,3106 4 0103 1 IGNITE CS FLAGWRD7 (2)
 0659 RFF 2 LAST 730 36,3107 7 4737 1 MASK IGNFLPIT
 0660 RFF 223 LAST 737 36,3110 10 000 0 CFS A
 0661 RFF 1 36,3111 1 2122 1 TCF IGNITE1
 0662 RFF 36 LAST 735 36,3112 3 4753 1 CAF RIT1
 0663 36,3113 0 0004 0 INHINT
 0664 RFF 16 LAST 736 36,3114 5 5172 1 TC TWIDDLE
 0665 RFF 2 LAST 241 36,3115 02432 0 ADRES IGNITION

0666 RFF 1 36,3116 3 4360 0 CAF CCT23 IMMEDIATE RESTART AT IGNITION.

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0667	REF	104	LAST	736	36,3117	54 001 1	TS	L	
0668					36,3120	4 000 0	CRM		
0669	REF	5	LAST	733	36,3121	52 760 1	EXCH	-PHASE4	
0670	REF	5	LAST	734	36,3122	4 4762 1	IGNITE1	CS	CNTDCEX
0671	REF	18	LAST	738	36,3123	55 162 1	TS	DISPCX	RESTORE OLD DISPLAY.
0672	REF	119	LAST	739	36,3124	1 5155 1	TCF	ENDOFJOB	

P0673

0674	REF	20	LAST	662	36,3125	0 5567 0	P40ALM	TC	ALARM	PROGRAM SELECTION NOT CONSISTENT WITH
0675					36,3126	01706 1		CCT	1716	VEHICLE CONFIGURATION
0676	REF	4	LAST	662	36,3127	2 5076 1	PFP40ALM	CAF	VC5NDS	(14)
0677	REF	197	LAST	738	36,3130	0 4616 1		TC	BANKCALL	
0678	REF	20	LAST	705	36,3131	20477 1		CADR	GCFLASH	
0679	REF	21	LAST	738	36,3132	1 6001 1		TCF	GCICPCH	V34E TERMINATE
0680					36,3133	1 3135 1		TCF	+2	PROCEED CHECK FOR P42
0681	REF	2	LAST	724	36,3134	1 3127 1		TCF	PFP40ALM	V32F REDISPLAY ALARM
0682	REF	18	LAST	739	36,3135	51 455 1		INDEX	WHICH	FOR P42, ALLOW CREW TO PROCEED EVEN
0683					36,3136	1 0014 0		TCF	14	THOUGH VEHICLE IS UNSTAGED

R0684

0685					31,2144			BANK	31	
0686	REF	1			35,2140			SFTLCC	P40S2	
0687					35,27 7			BANK		
0688	REF	2	LAST	733 TC	734:	25 25*		COUNT#	44/P41	

0689	REF	10	LAST	736	35,3707	0 4645 1	P40ALTC	TC	MAKECADR	FELL THERE.
0690	REF	4	LAST	476	35,3710	55 163 0		TS	TEMPRED	FOR GENERALIZED RETURN TO OTHER BANKS.
0691	REF	158	LAST	740	35,3711	0 4616 1	P40A/P	TC	BANKCALL	SUBROUTINE TO CHECK PGNC'S CONTROL
0692	REF	3	LAST	520	35,3712	54261 0		CADR	G+M,ALTC	AND ALTC STABILIZATION MODES
0693	REF	224	LAST	739	35,3713	10 000 0		CDS	A	+0 INDICATES IN PGNC'S, IN AUTO
0694	REF	1			35,3714	1 2726 0		TCF	TURNITON	+ INDICATES NOT IN PGNC'S AND/OR ALTC
0695	REF	3	LAST	728	35,3715	3 4737 0		CAF	APSLBIT	ARE WE ON THE DESCENT STAGE?
0696	REF	13	LAST	728	35,3716	7 0176 1		MASK	FLOWP10	
0697	REF	225	LAST	740	35,3717	10 000 0		CDS	A	
0698	REF	1			35,3720	1 3733 1		TCF	GOBACK	RETURN
0699	REF	23	LAST	718	35,3721	3 4747 1		CAF	BIT5	YES, CHECK FOR AUTOTHRCTLE MODE
0700					35,3722	0 0076 1		EXTEND		
0701	REF	4	LAST	478	35,3723	02 000 1		PAND	CHAN3C	
0702					35,3724	0 0006 1		EXTEND		
0703	REF	2	LAST	740	35,3725	1 2733 1		RZF	GOBACK	IN AUTOTHRCTLE MODE -- RETURN

L -BURN, PARY, SUPN -- MASTER IGNITION ROUTINE

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```

0704 RFF 1 35,3724 2 3735 C TURNITON CAF P40A/PMD DISPLAY V5CN25 RI=203 PLEASE PERFORM
0705 RFF 199 LAST 740 35,3727 1 4616 1 TC BANKCALL CHECKLIST 203 TURN ON FGACS ETC.
0706 RFF 3 LAST 515 35,3730 2 4624 1 CADR GCPEPFI
0707 RFF 21 LAST 740 35,3731 1 4601 1 TCF GCTCPFCH V34E TERMINATE
0708 RFF 1 35,3732 1 3711 1 TCF P40A/P RECYCLE
0709 RFF 5 LAST 740 35,3733 3 1163 1 GCPACK CA TEMPR63
0710 RFF 13 LAST 736 35,3734 1 4647 1 TC BANKJLME GOODBYE. COME AGAIN SCRN.

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0711 35,3735 0 213 1 P40A/PMD OCT DJ203

```

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0712 35,3137 BANK 36
0713 RFF 5 LAST 734 36,2100 SETLCC P40S
0714 36,3137 BANK

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```

0715 RFF 5 LAST 734 TO 740: 226 607* COUNT* 45/P4

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R0716 *****
R0717 GCSTANTS FOR THE IGNITION ROUTINE
R0718 *****

```

```

0719 RFF 1 36,2107 SERVCADR = P63TABLE +7

```

```

0720 RFF 1 36,2137 02040 1 P41ADRES ADRES P41TABLE

```

```

0721 RFF 1 36,2140 02051 0 P41ADRES ADRES P41TABLE -5

```

```

0722 RFF 1 36,2141 02063 0 P42ADRES ADRES P42TABLE

```

```

0723 RFF 25 LAST 734 37,1515 FRANK= DVCNTR

```

```

0724 RFF 1 35,3142 02011 1 LINLANAC 2CADR LINLANAC
0724 RFF 1 36,2142 62167 1

```

```

0727 RFF 26 LAST 741 37,1515 FRANK= DVCNTR

```

```

0728 RFF 1 36,3144 03372 1 ATMAGADR 2CADR ATMAG

```

```

0728 RFF 1 36,3145 70067 1

```

```

0729 RFF 22 LAST 741 37,1515 2 = GCTOPDCH

```

```

0730 36,3146 00101 1 020.9SEC 2DEC 2990

```

```

0731 36,3147 05656 1

```

```

0731 36,3150 04572 0 024.9SEC DEC 2490

```

```

0732 36,3151 00752 1 4.0SEC DEC 490

```

```

0733 RFF 34 LAST 740 4747 OCT20 = BIT5

```


GAP: ASSEMBLE REVISION 116 OF ACC PROGRAM LUMINARY BY NASA 2021112-071

19:09 AUG. 11, 1969 FLY

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L BURN, BABY, BURN -- MASTER IGNITION ROUTINE

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07331

36,2152 11475 V06061 VN 661

L BURN, BABY, BURN -- MASTER IGNITION ROUTINE

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E7 S2

P0735 KILLTASK
 R0736 MCD AC: NEW PROGRAM
 P0737 MCD PY: COVELLI

P0738 FUNCTIONAL DESCRIPTION:

P0739 KILLTASK IS USED TO REMOVE A TASK FROM THE WAITLIST BY SUBSTITUTING A NULL TASK CALLED 'NULLTASK' (OF COURSE),
 P0741 WHICH MERELY DOES / TO TASKOVER. IF THE SAME TASK IS SCHEDULED MORE THAN ONCE, ONLY THE ONE WHICH WILL OCCUR
 P0743 FIRST IS REMOVED. IF THE TASK IS NOT SCHEDULED, KILLTASK TAKES NO ACTION AND RETURNS WITH NO ALARM. KILLTASK
 R0745 LEAVES INTERRUPTS INHIBITED SO CALLER MUST REINIT

P0746 CALLING SEQUENCE:

A0748		L	TC	KILLTASK	IN FIXED-FIXED
A0749		L+1	CADR	????????	CADR (ACT 2CADR) OF TASK TO BE REMOVED.
AC750		L+2	(RFLINT)		RETURN

P0751 EXIT MODE: AT L+2 OF CALLING SEQUENCE.

R0752 CRASAELE INITIALIZATION= NONE.

R0753 OUTPLT: 2CADR OF NULLTASK IN LST2

P0754 REFRIS: ITMP1 - ITMP6, A, L, Q.

0755	REF	19	LAST	222	F3,1410	EBANK= LST2	
0756					6 32	PLCCK 3	KILLTASK MUST BE IN FIXED-FIXED.
0757	REF	3	LAST	564	6 11	SETLFC PFTAG6	
0758					6 32	BANK	
0759	REF	1				CCUNT* \$\$/KILL	
0760	REF	1			6 32	CA KILLPB	
0761					6 33	INIT	
0761	REF	224	LAST	740	6 34	LXCH A	
0762	REF	196	LAST	736	6 35	INDEX Q	
0763					6 36	CA 0	GET CADR.
0764	REF	16	LAST	588	6 37	LXCH PRANK	
0765	REF	1			6 40	TCF KILLTSK2	CONTINUE IN SWITCHED FIXED
0766	REF	20	LAST	742	F3,1410	EBANK= LST2	
0767	REF	2	LAST	743	6 41	BBOCN KILLTSK2	

0768					27,2200	BANK 27	
------	--	--	--	--	---------	---------	--

0769	REF	3	LAST	44	27,200	SETLFC P40SI	
0770					27,2200	BANK	
0771	REF	1				CCUNT* \$\$/KILL	

0772	REF	10	LAST	546	27,2200	22 62 0 KILLTSK2 LXCH ITMP2	SAVE CALLER'S EBANK
------	-----	----	------	-----	---------	-----------------------------	---------------------

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0773	REF	197	LAST	743	27,2201	24 002 0		INCP	Q		
0774					27,2202	24 006 1		EXTEND			
0775	REF	29	LAST	615	27,2203	22 061 0		EXCF	ITEMP1	RETURN 2CAGR IN ITEMP1,ITEMF2	
0776	REF	15	LAST	561	27,2204	54 063 0		TS	ITEMF3	CAGR IS IN A	
0777	REF	5	LAST	457	27,2205	7 5012 0		MASK	LCW10		
0778	REF	21	LAST	433	27,2206	6 4741 1		AD	RIT11		
0779	REF	6	LAST	559	27,2207	54 064 1		TS	ITEMP4	GENADR OF TASK	
0780	REF	6	LAST	744	27,2210	4 5012 0		CS	LCW10		
0781	REF	16	LAST	744	27,2211	7 0063 0		MASK	ITEMF3		
0782	REF	17	LAST	744	27,2212	54 063 0		TS	ITEMP3	FBANK OF TASK	
0783					27,2213	22 007 0		ZL			
0784	REF	105	LAST	740	27,2214	50 001 0	ACRSCAN	INDEX	L		
0785	REF	21	LAST	743	27,2215	4 1410 1		CS	LST2		
0786	REF	7	LAST	744	27,2216	6 0064 0		AD	ITEMF4	COMPARE GENADRS	
0787					27,2217	0 0006 1		EXTEND			
0788	REF	1			27,2220	1 2232 1		BZF	TSTFBANK	IF THEY MATCH, COMPARE FRANKS	
0789	REF	1			27,2221	4 4747 0	LEFTTLIV	CS	LSTLIN		
0790	REF	106	LAST	744	27,2222	6 0001 0		AD	L		
0791					27,2223	0 0006 1		EXTEND		ARE WE DONE?	
0792	REF	1			27,2224	1 2230 0		BZF	DEAD	YES - DONE, SO RETURN	
0793	REF	107	LAST	744	27,2225	24 001 0		INCP	L		
0794	REF	108	LAST	744	27,2226	24 001 0		INCP	L		
0795	REF	1			27,2227	1 2214 0		TCF	ACRSCAN	CONTINUE LCCF.	
0796	REF	30	LAST	744	27,2230	52 062 1	DEAD	EXCF	ITEMP1		
0797					27,2231	52 006 0		ETCB			
0798	REF	7	LAST	744	27,2232	4 5012 0	TSTFBANK	CS	LCW10		
0799	REF	109	LAST	744	27,2233	50 001 0		INDEX	L		
0800	REF	22	LAST	744	27,2234	7 1411 0		MASK	LST2 +1	COMPARE FRANKS ONLY.	
0801					27,2235	0 0006 1		EXTEND			
0802	REF	18	LAST	744	27,2236	60 063 1		SU	ITEMP3		
0803					27,2237	0 0006 1		EXTEND			
0804	REF	1			27,2240	1 2242 0		BZF	KILLDEAD	MATCH - KILL IT.	
0805	REF	1			27,2241	1 2221 0		TCF	LEFTTLIV	NO MATCH - CONTINUE.	
0806	REF	1			27,2242	3 4353 0	KILLDEAD	CA	TCTSKCVR		
0807	REF	110	LAST	744	27,2243	50 001 0		INDEX	L		
0808	REF	23	LAST	744	27,2244	55 410 1		TS	LST2	REMOVE TASK BY INSERTING TASKOVER	
0809	REF	2	LAST	744	27,2245	1 2230 0		TCF	DEAD		
0810	REF	25	LAST	741	4747			LSTLIN	EQUALS RIT5	REC 16	

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R0001 PROGRAM DESCRIPTION P40BTH DECEMBER 22, 1966
 R0002 MOD 13 BY PETER ADLER MARCH 3, 1967
 R0003 CALLED VIA JOB FROM V27

R0004 FUNCTIONAL DESCRIPTION

R0005 1) TO COMPLETE A PREFERRED IMU ORIENTATION AND A PREFERRED VEHICLE ATTITUDE FOR A LM CPS
 R0007 THRUSTING MANEUVER.
 R0008 2) TO DO THE VEHICLE MANEUVER TO THE THRUSTING ATTITUDE.
 R0009 4) TO CONTROL THE PGNS DURING COUNTDOWN, IGNITION, THRUSTING, AND THRUST TERMINATION OF A
 R0011 PGNS CONTROLLED CPS MANEUVER.
 R0012 5) IN POSTBURN--ZERO RENDEZVOUS COUNTER, MAINTAIN VG CALCULATIONS FOR POSSIBLE RCS MANEUVER,
 R0014 SET MAXIMUM DEADBAND IN GAP, RESET STEERLAW CSTEER TO ZERO.
 R0016 NOTE: P42, WHICH IS IN THIS LCC SECTION, DOES THE SAME FOR AN APS BURN, AND P41 DOES 1-3 FOR
 R0018 RCS PLUS DISPLAYS PARAMETERS FOR MANUAL CONTROL.

R0019 SHORTCUTS USED

R0020 P42 IMU STATUS CHECK
 R0021 S40.1 COMPUTATION OF THRUST DIRECTION
 R0022 S40.13 LENGTH OF PLEN
 R0023 S40.2,3 PREFERRED IMU ORIENTATION
 R0024 S40.8 X PRODUCT STEERING
 R0025 S40.9 LAMBERT VECTOR
 R0026 S60LEM ATTITUDE MANEUVER
 R0027 LEMPPFC EXTRAPOLATE STATE VECTOR
 R0028 PREFRAD AVERAGE G, SERVICES
 R0029 ALLCOAST GAP COASTING INITIALIZATION
 R0030 CLKTASK ERCE CLKRJCE--COUNT DOWN
 R0031 PHASCHNG, INTERP, FLAGUP, FLAGDOWN, WAITLIST, LONGCALL, GCFLASH, GOFLASH, GCPREF1, ALARM,
 R0033 PRICLARM, GCTDPOOF, ENDEFJOB, BANKCALL, SETMAXCR, SETMINDB, CHECKMM, FLATCLT, CLTELAT,
 R0035 KILLTASK, SENACRRE, TPAGREE, ETC.

R0036 RESTARTS VIA GROUP 4

R0037 DISPLAYS

R0038 VERN25 203 A/P TO PGNS, AUTO THROTTLE MODE, AUTO ATTITUDE CONTROL
 R0040 V06N47 TTI, VG, DELTAVM (DISPLAYED CNCE/SECCND BY CLKTASK)
 R0041 V06N99 PLEASE PERFORM ENGINE ON ENABLE
 R0042 V06N40 TG (TIME TO GO TO CLTCHF), VG, DELTAVM--CNCE/SECCND
 R0043 V16N41 FINAL VALUES OF TG, VG, DELTAVM
 R0044 V16N85 COME OF VG (ECCEY AXES) FOR PCSS. RCS MANUAL MANEUVER
 R0045 V05N05 POSSIBLE ALARMS
 R0046 V50N07 PLEASE SELECT P43

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R0047 VIA R30

R0048 V16N44 H/PC, PERI, TFE

R0049 V16N35 TIME TO PERIETE, HMS

R0050 ALARM OR ABORT EXIT MODES

R0051 PROGRAM ALARM, FLASHING DISPLAY OF ALARM CODE 1706 IF P40 SELECTED WITH DESCENT UNIT STAGED.
 R0053 V34E (TERMINATE) IS THE ONLY RESPONSE ACCEPTED. TO GETOPCCH.

R0054 PROGRAM ALARM, FLASH CODE 1703: TIG LESS THAN 45 SECS AWAY. V34E= GETOPCCH OR V33E= SLIP
 R0056 TIG BY 45 SECS.

R0057 FRASAELE INITIALIZATION

R0058 DEPOS

R0059 OUTPUT

R0060 SEE SUBROUTINES E.C.: S40.1, S40.2,3, S40.13, S40.8, S40.9, TRIMTIME

R0062 XDELVFLG = 1 FOR EXT DELV COMPUTATION

R0063 = 0 FOR AIMPT (LAMBERT) COMP

R0064 RFF 2 LAST 38 TC 39: 10 10* COUNT* \$1/P40
 R0065 RFF 19 LAST 741 57,1455 FRANK= WHICH

R0066 36,2152 BANK 36
 R0067 RFF 6 LAST 741 33,2110 SETLCC P40S
 R0068 36,2152 BANK

R0069 RFF 43 LAST 739 36,3153 0 5353 1 P40LM TC PHASCHNG
 R0069 36,2154 04024 0 CCT 04024

R0069 RFF 1 36,3155 3 3137 1 CAF P40ADPES INITIALIZATION FOR BURNEEY.
 R0070 RFF 20 LAST 745 36,3156 55,455 0 TS WHICH

R0071 RFF 14 LAST 740 36,3157 3 0106 0 CA FLGWRD10
 R0072 RFF 9 LAST 740 36,3160 7 4737 1 MASK APSELBIT

R0073 RFF 227 LAST 743 36,3161 1 000 0 CCS A
 R0074 RFF 1 36,2162 1 2125 0 TCF P40ALM

R0079 RFF 200 LAST 741 36,3163 1 4616 1 TC BANKCALL GO DC IML STATUS CHECK ROUTINE.
 R0080 RFF 4 LAST 504 36,3164 11235 0 CACR R02BCTH

R0081 RFF 20 LAST 735 36,2165 4 0111 1 CS DAPBEELS INITIALIZE EVMEN

R0082 RFF 5 LAST 296 36,3166 7 4737 1 MASK CSMDNCKD
 R0083 RFF 228 LAST 746 36,2167 10 000 0 CCS A

R0084 RFF 1 36,3171 3 2022 1 CAF THRESH1
 R0085 RFF 1 36,3171 6 2023 1 AC THRESH3

R0086 RFF 2 LAST 105 36,2172 55,250 0 TS DVTHRLSH
 R0087 RFF 11 LAST 734 36,3173 3 4751 0 CAF ECLR

R0088 RFF 27 LAST 741 36,3174 55,515 0 TS EVNTE

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0081	PEF	99	LAST	727	36,3175	1 6042 1	TC	INTPRET	LOAD CONSTANTS FOR FPS ELRN
0082					36,3176	42175 C	VLCAC	CLEAR	LOAD F, PDCT, TDECAY
0083	PEF	1			36,3177	24001 1		ENDPS	
0084	PEF	1			36,3211	02663 1		NETHROTL	
0085	PEF	2	LAST	144	36,3211	03735 C	STORE	F	
00852					36,3212	77735 0	SLCAD		
00854	PEF	1			36,3213	26002 1		DPSVFX	
00856					36,3214	70476 C	P40JN	CCCMF	SRI
0086	PEF	1			36,3215	27743 0	STCALL	VFX	LOAD EXHAUST VELOCITY FOR TCC CMF.
0087	PEF	1			36,3216	56246 1		S40.1	COMPUTES UT AND VGTG
0088					36,3217	77624 1	CALL		
0089	PEF	1			36,3217	56413 1		S40.2,3	COMPUTES PREFERRED INL ORIENTATION
0090					36,3211	77775 1	EXIT		
00901					36,3212	0 004 0	INHINT		
00902	PEF	29	LAST	735	36,3213	0 4674 0	TC	IRKCALL	
00903	PEF	1			36,3214	40143 0	CADR	PFLITFCB	ZFRC ATTITUDE ERRORS, SET CP TO ONE DEG.
0091	PEF	1			36,3215	0 3217 0	TC	P40SXT4	
0092									
0093	PEF	1			36,3216	1 2130 C		TCF	BLNRABY
00904									
0095					36,3217	0 006 1	P40SXT4	EXTEND	
0096	PEF	3	LAST	738	36,3220	231141 1	CXCF	P40/PFT	
0100					36,3221	0 0003 1	P41MANU	PFLINT	
0101	PEF	75	LAST	730	36,3222	5516 C	TC	DOWNFLAG	CLEAR 3AXISFLG -- P60 WILL USE VFCFCINT.
0102	PEF	6	LAST	521	36,3223	00124 0	ADRES	3AXISFLG	
0103	PEF	211	LAST	746	36,3224	0 4616 1	TC	BANKCALL	
0104	PEF	4	LAST	521	36,3225	54123 0	CADR	REFLEM	ON ATTITUDE MANEUVER ROUTINE
0105	PEF	4	LAST	747	36,3226	0 1141 1	TC	P41/PFT	
0106	PEF	7	LAST	732	57,1462		EPANK=	TRKMKCNT	
0107	PEF	19	LAST	738	36,3227	3 0075 1	POSTBURN	CA	Z
0108	PEF	10	LAST	740	36,3228	551162 1		TS	DISPDEX
0109					36,3231	0 0016 1		EXTEND	
0110	PEF	1			36,3232	3 2067 0	CCA	ACACN85	
0111	PEF	4	LAST	728	36,3233	521252 1	CXCF	AVLGEXIT	
0112	PEF	1			36,3234	2 3764 1	CAF	V16N40	
0113	PEF	202	LAST	747	36,3235	0 4616 1	TC	BANKCALL	
0114	PEF	1			36,3236	20676 C	CADR	GCFLASHR	
0115	PEF	1			36,3237	0 3262 1	TC	TERM40	
0116	PEF	2	LAST	732	36,3240	1 3245 C	TCF	TIGNCW	
0117	PEF	3	LAST	739	36,3241	0 0227 1	TC	PCSTBURN	

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0118	REF	44	LAST	746	36,3242	0 5352	1	P4CPHS1	TC	PHASCHNG	
0119					36,3243	00014	1		CCT	AC014	
0120	REF	121	LAST	740	36,3244	1 5155	1		TCF	ENDCFJCB	
0121					36,3245	0 0004	1	TIGNOW	INHINT		
01211	REF	30	LAST	747	36,3246	0 4674	1		TC	1BNKCALL	
01212	REF	4	LAST	521	36,3247	40154	0		CACF	ZATTERCF	
0122	REF	31	LAST	748	36,3250	0 4674	0		TC	1BNKCALL	
0123	REF	3	LAST	521	36,3251	40141	1		CACF	SLTMINDB	
0124					36,3252	0 0003	1		RELINT		
0125	REF	2	LAST	728	36,3253	3 3765	0		CAF	V16K85B	
0126	REF	203	LAST	747	36,3254	0 4616	1		TC	BANKCALL	
0127	REF	1			36,3255	23462	1		CADR	REFFLASHR	
0128	REF	2	LAST	747	36,3256	0 3262	1		TC	TEPM4C	
0129	REF	3	LAST	746	36,3257	1 3262	0		TCF	TEPM41	
0130					36,3260	0 3253	0		TC	-5	
0130F	REF	1			36,3261	1 3242	1		TCF	P4CPHS1	
0131					36,3262	0 0006	1	TEPM4C	EXTEND		
0132	REF	1			36,3263	2 2110	0		DCA	SEFVCADR	
0133	REF	5	LAST	747	36,3264	531252	1		EXCF	AVEGEXIT	
0134	REF	137	LAST	738	36,3265	3 4755	1		CAF	ZERC	
0135	REF	8	LAST	747	36,3266	551462	1		TS	TRMKMCNT	ZERC PENDZVS CNTERS
0136	REF	20	LAST	747	36,3267	3 0005	1		CA	Z	
0137	REF	20	LAST	747	36,3270	551162	1		TS	DISPDEX	
0138					36,3271	0 1004	1		INHINT		
0139	REF	32	LAST	748	36,3272	0 4674	0		TC	1BNKCALL	
0140	REF	6	LAST	521	36,3273	4 1115	0		CADP	RESTERDB	
0141					36,3274	0 0003	1		RELINT		
0142	REF	23	LAST	741	36,3275	0 6001	0		TC	GCTCFCH	
0143	REF	21	LAST	746	37,1455				ERANK=	WHICH	
0144	REF	1							CCLNT*	11/P41	
0145	REF	1			36,3276	2 3140	1	P41LM	CAF	P41ADRES	INITIALIZATION FOR EURNFAEY
0146	REF	22	LAST	748	36,3277	551455	0		TS	WHICH	
0147	REF	204	LAST	748	36,3300	0 4616	1		TC	BANKCALL	
0148	REF	5	LAST	746	36,3301	11236	0		CADR	PC2ROTH	
0149	REF	100	LAST	747	36,3302	1 6042	1		TC	INTPRET	BOTH LM
0150					36,3303	71214	0		BON	DLCAD	IF NJETSFLAG IS SET, LCAD 2 JET F
0151	REF	1			36,3304	00700	0			NJETSFLG	
0152	REF	1			36,3305	75311	0			P41FJFT1	
0153	REF	1			36,3306	34017	0			FRCS4	IF NJETSFLAG IS CLEAR, LCAD 4 JET F
0154	REF	2	LAST	747	36,3307	37735	1	P41FJFT	STCALL	F	
0155	REF	1			36,3310	75314	0			P41LM	
0156					36,3311	77745	1	P41FJFT1	DLCAD		

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018801					36,3356	0 0006 1	EXTEND	
018802	REF	1			36,3357	1 2351 1	BZF	BLNKWAIT
018803	REF	4	LAST	749	36,3360	3 2765 0	CAF	V16N85R
018804	REF	227	LAST	749	36,3361	1 4616 1	TC	BANKCALL
018805	REF	2	LAST	749	36,3362	20447 1	CADR	GCOSPRET
018806	REF	7	LAST	749	36,3363	3 5017 1	CAF	PR105
018807	REF	12	LAST	706	36,3364	0 5146 1	TC	PR100FNC
018808	REF	23	LAST	749	36,3365	3 1162 0	DYNMDISP	CA DISPCFX
018809					36,3366	0 0006 1	EXTEND	
018811	REF	121	LAST	748	36,3367	6 5155 0	BZMF	ENDOFFJCE
018811	REF	122	LAST	749	36,3370	5 6242 1	TC	INTPRET
018812					36,3371	45175 0	VLOAD	CALL
018813	REF	4	LAST	749	36,3372	0 3701 1		VEPPEV
018814	REF	2	LAST	749	36,3373	57267 0		S41.1
018815	REF	7	LAST	749	36,3374	03512 0	STORE	VEBODY
018816					36,3375	77776 1	EXIT	
018817	REF	14	LAST	749	36,3376	3 4777 1	CAF	1SEC
018818	REF	206	LAST	750	36,3377	0 4616 1	TC	BANKCALL
018819	REF	13	LAST	749	36,3400	01726 1	CADR	DELAYJOB
01882	REF	2	LAST	749	36,3401	1 3365 0	TCF	DYNMDISP

A NON-POSITIVE DISPCFX INDICATES PAST
TIG-35, SC SERVICER WILL BE DOING THE
UPDATING OF NCUN 85. STOP DYNMDISP.

0189	REF	103	LAST	750	36,3402	1 6042 1	CALCRES	TC INTERP
0190					36,3403	77624 1	CALL	
0191	REF	1			36,3404	75615 1		UPDATEVC
0192					36,3405	45175 0	VLOAD	CALL
0193	REF	5	LAST	750	36,3406	12711 1		VEPPEV
0194	REF	3	LAST	750	36,3407	57267 0		S41.1
0195	REF	8	LAST	750	36,3410	03502 0	STORE	VEBODY
0196					36,3411	77776 1	EXIT	
0197	REF	42	LAST	723	36,3412	0 4635 0	TC	POSTJUMP
0198	REF	3	LAST	724	36,3413	65761 1	CADR	SEPVEXIT

0199	REF	1					CCOUNT#	88/P42
0200	REF	23	LAST	748	57,1455		EBANK#	WHICH

0201	REF	45	LAST	748	36,3414	0 5353 1	P42LM	TC P42SCFNG
02012					36,3415	04024 0	CCT	04024

02014	REF	1			36,3416	3 2141 1	CAF	P42ADPFS
0202	REF	24	LAST	750	36,3417	551455 0	TS	WHICH

INITIALIZATION FOR BURNARY.

0203	REF	15	LAST	746	36,3420	4 0106 1	CS	FLGWRC10
0204	REF	10	LAST	746	36,3421	7 4737 1	MASK	APSFLP1T
0205	REF	229	LAST	746	36,3422	10 000 0	CCS	A
0208	REF	2	LAST	746	36,3423	0 2125 1	TC	P40ALM
0209	REF	209	LAST	750	36,3424	0 4616 1	P42STAGE	TC BANKCALL

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02101	RFF	1	LAST	748	36,3425	11236 0	CADR	R02R0TH	
02102	RFF	2	LAST	746	36,3427	55'250 3	CAF	THRESH2	INITIALIZE DVNCA
02103	RFF	12	LAST	746	36,3431	3 4751 0	TS	DVTHPUSH	
02104	RFF	24	LAST	746	36,3431	55'515 0	CAF	FCLF	
							TS	DVCNTR	
02111	RFF	134	LAST	750	36,3432	0 6142 1	TC	INTPRET	
02112	RFF	5	LAST	657	36,3433	77214 0	SFT	VLOAD	LOAD FAPS, MDCTAPS, AND ATDECAY INTO
02113	RFF	5	LAST	657	36,3434	1072 0		AVELAG	F, MDCT, AND TDECAY BY VECTOR LOAD.
02114	RFF	1			36,3435	34007 1		FAPS	
02115	RFF	5	LAST	749	36,3436	03735 0	STORE	F	
02116	RFF	1			36,3437	52135 1	SLDAD	GCTC	
021162	RFF	1			36,3440	26001 1		APPEVE X	
021164	RFF	1			36,3441	75204 0		P411A	
02117	RFF	25	LAST	750	57,1455		EBANK=	WHICH	
02118	RFF	1					COUNT*	\$f/P47	
02119	RFF	210	LAST	750	36,3442	0 4616 1	P47LM	TC	PANKCALL
02200	RFF	7	LAST	751	36,3442	11236 0	CADR	R02R0TH	
02201	RFF	105	LAST	751	36,3444	0 6142 1	TC	INTPRET	
02222	RFF	1			36,3445	77624 1	CALRE		
02223	RFF	1			36,3446	27551 0		MDTCAV2	
02224	RFF	256	LAST	736	36,3447	3 0155 0	CA	MPAC +1	
02225	RFF	17	LAST	736	36,3448	5173 1	TC	TWIDCLE	
02226	RFF	1			36,3451	03453 0	ADRES	STARTP47	
02261	RFF	122	LAST	750	36,3452	1 5155 1	TCF	ENDCEJCB	
02277	RFF	46	LAST	750	36,3452	0 5253 1	STARTP47	TC	PHASCHNG
02391					36,3454	05014 1	CCT	15014	
02392					36,3455	77777 0	CCT	77777	
02393					36,3456	0 0006 1	EXTEND		
02400	RFF	1			36,3457	3 3770 1	DCA	ACADN33	
02411	RFF	6	LAST	748	36,346	53'252 1	EXCH	AVGEXTI	
0242	RFF	5	LAST	729	36,3451	3 4736 1	CAF	PR1020	
0243	RFF	22	LAST	749	36,3462	0 5105 0	TC	FINDVAC	
0244	RFF	4	LAST	317	57,1622		EBANK=	DELVINU	
0245	RFF	1			36,3463	03517 1	2CADR	P47RCDY	
0245	RFF	1			36,3464	74067 0			
0246	RFF	2	LAST	241	36,3465	1 2344 1	TCF	RE104.2	CHECKS PHASE 5 AND GCES TC PREFEAD
A0247									SFE T10-3) IN BURNBABY.
0249	RFF	116	LAST	751	36,3466	0 6142 1	CALCNE3	TC	INTPRET
0249	RFF	1			36,3467	53375 0	VLOAD	VAD	
0250	RFF	1			36,3470	03502 1		DELVCTL	
0251	RFF	2	LAST	148	36,3471	03527 1		DELVPEF	
0252	RFF	11	LAST	680	36,3472	03656 1	STORE	DELVSIN	TEMP STORAGE FOR RESTARTS

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0253					26,3473	77524 1	CALL		
0254	REF	4	LAST	750	36,3474	57767 0		S41.1	
0255	REF	5	LAST	751	26,3475	03623 0	STORE	DELVINU	
0256					36,3476	77776 1	EXIT		
02561	REF	47	LAST	751	36,3477	0 5353 1	TC	PHASCHNG	
02562					26,3501	10035 0	CCT	10035	REPEATAC AND HERE
02563	REF	107	LAST	751	36,3501	0 6142 1	TC	INTPRET	
02564					36,3502	77775 1	VLCAD		
02565	REF	12	LAST	751	36,3503	03656 1		DELVSIN	
02566	REF	2	LAST	751	36,3504	03502 0	STORE	DELVCTL	
02567					26,3505	77776 1	EXIT		
0257	REF	43	LAST	750	36,3506	0 4635 0	TC	POSTJUMP	
0258	REF	4	LAST	750	26,3507	65761 1	CACR	SERVEXIT	
0259	REF	1			36,3510	2 3766 0	P47BCD	CAF	V1683
0260	REF	211	LAST	751	36,3511	0 4616 1	TC	BANKCALL	
0261	REF	2	LAST	747	36,3512	22636 0	CADR	GCFCLASHR	
0262	REF	24	LAST	748	36,3513	0 6011 0	TC	GCTOPGCH	
0263	REF	25	LAST	752	36,3514	0 6011 0	TC	GCTOPCCH	
02631	REF	2	LAST	751	36,3515	1 3517 0	TCF	P47BCDY	
02632	REF	2	LAST	748	36,3516	1 3242 1	TCF	P40PHS1	
0264	REF	108	LAST	752	36,3517	0 6042 1	P47BCDY	TC	INTPRET
0265					36,3520	77775 1	VLCAD		
0266	REF	5	LAST	721	36,3521	06524 1		H16ZSPCS	
0267	REF	6	LAST	752	36,3522	03623 0	STORE	DELVINU	
0268	REF	3	LAST	752	36,3523	03502 0	STORE	DELVCTL	
0269					26,3524	77776 1	EXIT		
0270	REF	1			36,3525	0 3510 0	TC	P47BCD	
0271	REF	6	LAST	741	TC 743:	12 619*	COUNT*	11/P40	
0272	REF	7	LAST	735	36,3526	3 1517 0	IMPLPLRN	CA	TGC +1
02721	REF	1			36,3527	0 3741 0	TC	GETDT	
0273	REF	18	LAST	751	36,3530	0 5173 1	TC	TWIDELC	
0274	REF	2	LAST	241	26,3531	02546 0	ADRES	ENGOFISK	
0275	REF	76	LAST	747	36,3532	0 5516 0	TC	DOWNFLAG	TURN OFF IGNFLAG
0276	REF	3	LAST	732	36,3533	00153 0	ADRES	IGNFLAG	
0277	REF	77	LAST	752	36,3534	0 5516 0	TC	DOWNFLAG	TURN OFF ASTNFLAG
0278	REF	4	LAST	738	36,3535	00154 1	ADRES	ASTNFLAG	
0279	REF	73	LAST	752	36,3536	0 5516 0	TC	DOWNFLAG	TURN OFF IMPULSW
0280	REF	1			36,3537	00144 1	ADRES	IMPULSW	
0281	REF	48	LAST	752	36,3540	0 5353 1	TC	PHASCHNG	RESTART PROTECT ENGOFISK (ENGINEOFF)
0282					36,3541	40114 1	CCT	40114	
0283	REF	13	LAST	736	36,3542	0 5221 0	TC	FIXDELAY	WAIT HALF A SECOND
0284					36,3543	00062 0	TC	50	

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0285	REF	3	LAST	738	36,3544	0 2657 1	TC	NOULLAGE	TURN OFF ULLAGE
0286	REF	51	LAST	737	36,3545	0 5261 1	TC	TASKOVER	
0297	REF	35	LAST	740	36,3546	0 4674 0	ENGINEFSK	TC	IRANKALL
0288	REF	1			36,3547	75551 1	CADP	ENGINEOFF	THIS CODING ALLOWS ENGINEOFF ET AL TO BE USED PCTH BY WAITLIST AND BY TC IRANKALL
0289	REF	51	LAST	753	36,3550	0 5261 1	TC	TASKOVER	
0290	REF	3	LAST	730	36,3551	3 4644 0	ENGINEOFF	CAF	PR1012
0291	REF	32	LAST	751	36,3552	0 5105 0	TC	FINDVAC	MUST BE LOWER PRIC THAN CLOCKJEE
0292	REF	9	LAST	748	57,1462		EBANK=	TRKMKCNT	
0293	REF	4	LAST	747	36,3553	03227 1	2CADP	PCSTBURN	
0294	REF	27	LAST	730	36,3554	74067 0			
0295	REF	34	LAST	731	36,3555	3 4753 1	ENGINECF2	CAF	BIT1
0296	REF	4	LAST	724	56,1422	0 5203 0	TC	WAITLIST	
0297	REF	1			36,3557	03612 1	EBANK=	CMEGAG	
0298	REF	1			36,3558	74066 1	2CADP	CCASTSET	
0299	REF	14	LAST	735	36,3561	4 0103 1	ENGINECF1	CS	FLAGWPD7
0300	REF	1			36,3562	7 4745 1	MASK	IDLEFBIT	SET THE IDLE BIT.
0301	REF	15	LAST	752	36,3563	26 102 1	ADS	FLAGWRC7	
0302	REF	4	LAST	753	36,3564	0 2657 1	TC	NOULLAGE	
0303	REF	22	LAST	727	36,3565	0 0006 1	ENGINECF4	EXTEND	
0304	REF	5	LAST	730	36,3566	2 0025 0	CCA	TIME2	
0305	REF	5	LAST	730	36,3567	53 0342 1	EXCF	TEVENT	
0306	REF	4	LAST	730	36,3570	4 4745 1	ENGINECF3	CS	ENGINEFIT
0307	REF	22	LAST	731	36,3571	7 01 1 0	MASK	FLAGWPD5	INSURE ENGINEFIC IS CLEAR.
0308	REF	23	LAST	753	36,3572	54 101 0	TS	FLAGWPD5	
0309	REF	7	LAST	720	26,2573	4 4355 1	CS	PRIC30	ENGINECF3 IS USED AS A PRE-ENGINE ARM
0310	REF	24	LAST	730	36,3574	0 0006 1	EXTEND		SUBROUTINE.
0311	REF	6	LAST	751	36,3575	02 011 0	RAND	DSALMCUT	
0312	REF	6	LAST	751	26,3576	6 4736 1	AD	PRIC20	TURN OFF THE ENGINE - CFS OR APS
0313	REF	25	LAST	753	36,3577	0 0006 1	EXTEND		
0314	REF	25	LAST	753	36,3578	01 011 0	WRITE	DSALMCUT	
0315	REF	21	LAST	746	36,3601	4 111 1	CS	DAPBCOLS	TURN OFF TRIM GIMBAL
0316	REF	1			36,3602	7 4736 0	MASK	USEQRJTS	
0317	REF	22	LAST	753	36,3603	26 111 1	ADS	DAPBCOLS	
0318	REF	1			36,3604	4 4737 1	CS	HIFTHROT	ZERO AUTO-THROTTLE WHENEVER THE ENGINE
0319	REF	2	LAST	723	36,3605	54 055 0	TS	TRJST	IS TURNED OFF.
0320	REF	21	LAST	733	26,3606	3 4750 1	CAF	BIT4	THE FAPEWARF ECES SC ONLY WHEN THE
0321	REF	0			36,3607	0 0006 1	EXTEND		ENGINE IS DISARMED.
0322	REF	0	LAST	734	36,3610	05 014 1	WCF	CHAN14	
0323	REF	2	LAST	563	36,3611	0 4707 0	TC	ISWRETPN	

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0324	REF	36	LAST	752	36,3612	0 4674 C	CCASTSET	TC	IBANKCALL	CC DAP CCASTING INITIALIZATION
0325	REF	4	LAST	739	36,3613	46205 1		CADR	ALLICAST	
0326	REF	52	LAST	753	36,3614	0 5261 1		TC	TASKOVER	
0327	REF	5	LAST	753	36,1422				FRANK= CMEGAC	
0328					36,3615	45220 1	UPDATEVE	STQ	CALL	
0329	REF	2	LAST	142	36,3616	03665 1			GTSMPI	
0330	REF	1			36,3617	56447 C			S40.8	X-PROLCT STEERING
0331					36,3621	43014 0	BON		BCN	
03311	REF	4	LAST	690	36,3621	01207 1			XDEI VFLG	
03312	REF	4	LAST	754	36,3622	02665 1			GTSMPI	
03313	REF	2	LAST	687	36,3623	03705 0			NCRMSW	
03314	REF	1			36,3624	75637 1			180SFUP	
03315					36,3625	45345 1		DLOAD	DSU	
03316	REF	6	LAST	706	36,3626	01234 0			PIPTIME	
03317	REF	1			36,3627	02763 C			TICSAVE	
03318					36,3631	50025 C		FSU	RMN	
03319	REF	1			36,3631	03432 1			TNEWA	
0332	REF	1			36,3632	75662 1			GETRANS	
03321					36,3633	43345 1		DLOAD	DAD	
03322	REF	2	LAST	754	36,3634	02763 C			TIGSAVE	
03323	REF	2	LAST	754	36,3635	03432 1			TNEWA	
0333	REF	1			36,3636	03765 J		STORE	TIGSAVEP	
0336					36,3637	77776 1	180SETUP	EXIT		
03361	REF	1			36,3640	10 754 0		CCS	PHASE2	
03362	REF	1			36,3641	1 3667 1		TCF	NC.9	
0337	REF	4	LAST	208	36,3642	2 4727 C		CAP	PRIC11	
0338					36,3643	0 0004 0		INFINT		
0339	REF	24	LAST	753	36,3644	0 5105 C		TC	FINDVAC	
0340	REF	2	LAST	144	37,1706			FRANK= VG		
0341	REF	1			36,3645	02707 0		2CADR	S40.9	LAMBERT VTOGAIN
0341	REF	1			36,3646	56767 C				
0342	REF	8	LAST	749	36,3647	0 5327 1		TC	2PHSCHNG	
0343					36,3650	00172 C		CCT	00172	2.17SFCT FOR S40.9
0344					36,3651	10035 C		CCT	10035	HERE AND REREADAC AFTER RESTART
0347	REF	109	LAST	752	36,3652	0 6042 1	ENDSTEER	TC	INTOPET	
034701					36,3653	77745 1		DLOAD		
034702	REF	2	LAST	754	36,3654	03765 0			TIGSAVEP	
03471	REF	2	LAST	754	36,3655	27763 0		STOVL	TIGSAVE	
03472	REF	7	LAST	717	36,3656	01220 0			RM	
03473	REF	8	LAST	692	36,3657	26323 1		STOVL	RINIT	
03474	REF	7	LAST	717	36,3660	01226 C			VN	
03475	REF	7	LAST	692	36,3661	02331 1		STORE	VINIT	
03476					36,3662	45345 1	GETRANS	DLOAD	DSU	
03477	REF	7	LAST	675	36,3662	02631 0			TPASS4	
03478	REF	7	LAST	754	36,3664	01234 0			PIPTIME	
0348	REF	6	LAST	685	36,3665	037452 0		STCALL	DELLT4	
0349	REF	5	LAST	754	36,3666	02665 1			GTSMPI	

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03491	REF	110	LAST	754	36,3667	0 6042 1	NC.9	TC	INTPFET
03492					36,3671	77650 1		GCTC	
03493	REF	6	LAST	754	36,3671	03665 1			QTEMP1
03500	REF	111	LAST	755	36,3672	0 6042 1	STEERING	TC	INTPRET
0351					36,3673	77624 1		CALL	
0352	REF	2	LAST	750	36,3674	75615 1			UPDATEVC
0353					36,3675	77776 1		EXIT	
0354	REF	29	LAST	751	37,1515			EBANK=	DVCMTP
0355					36,3676	0 0004 0	ASTFCR	INFINT	
0356	REF	5	LAST	732	36,3677	3 5016 0		CA	FRANK7
0357	REF	23	LAST	732	36,3700	54 0000 0		TS	FRANK
0359	REF	15	LAST	732	36,3711	4 0076 1		CS	FLAGWCD2
0360	REF	2	LAST	732	36,3702	7 4742 1		MASK	IMPLBIT
0361	REF	230	LAST	750	36,3703	10 0000 0		CCS	A
0362					36,3704	1 3711 1		TCF	+5
0363	REF	16	LAST	753	36,3705	4 0003 1		CS	FLAGWCD7
0364	REF	2	LAST	753	36,3706	7 4745 1		MASK	IDLEFBIT
0365	REF	231	LAST	755	36,3707	1 0000 0		CCS	A
0366					36,3710	1 3713 0		TCF	+3
0367	REF	44	LAST	752	36,3711	1 4635 0		TC	POSTJUMP
0368	REF	5	LAST	752	36,3712	65761 1		CADR	SERVEXIT
03681	REF	27	LAST	754	36,3714	0 4674 0		TC	IBAKCALL
03682	REF	3	LAST	364	36,3714	40166 1		CADR	STEPRATE
0369	REF	79	LAST	752	36,3715	0 5516 0		TC	DOWNFLAG
0370	REF	2	LAST	752	36,3716	0 0044 1		ADRES	IMPULSW
0371	REF	51	LAST	738	36,3717	0 5524 0		TC	UPFLAG
0372	REF	4	LAST	734	36,3720	0 0161 1		ADRES	IDLEFLAG
0373					36,3721	0 0004 0		INFINT	
0374					36,3722	0 0006 1		EXTEND	
0375	REF	29	LAST	737	36,3723	3 1442 1		CCA	TIG
0376	REF	297	LAST	751	36,3724	52 155 1		DXCH	MFAC
0377					36,3725	0 0006 1		EXTEND	
0378	REF	23	LAST	752	36,3726	4 0025 1		FCS	TIME2
0379	REF	298	LAST	755	36,3727	20 155 1		PAS	MFAC
0380	REF	8	LAST	736	36,3730	0 7262 0		TC	TPAGREE
0381	REF	299	LAST	755	36,3731	20 155 0		CAE	MFAC +1
0382	REF	2	LAST	752	36,3732	0 0000 0		TC	GETOT
0383	REF	19	LAST	752	36,3733	1 5173 1		TC	TWIDLE
0384	REF	3	LAST	752	36,3734	0 3546 0		ADRES	ENGCFISK
0385	REF	0	LAST	754	36,3735	1 5227 1		TC	2PHSCHNG
0386					36,3736	4 0114 1		CCT	40114
0387					36,3737	0 0035 1		CCT	00035

CHECK IMPULSF SWITCH. IT IS SET EITHER BY S40.13 IF THURN<6 SECS OR BY S40.8 IF STEERING IS ALMOST DONE.

IMPULSW = 0 EXIT
IMPULSW = 1 WHY? CHECK IDLEFLAG
(IDLEFLAG = 0 --> DVCMON ON)

DVCMON ON-->THRUSTING-->IMPULSW VIA S40.8
DVCMON OFF-->IMPULSW ON VIA S40.13-->EXIT

TURN OFF IMPULSW

TURN OFF DVCMON

ENGCFISK (ENGINE OFF)
SERVICER--REPEACAC

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0396	REF 122	LAST	751	36,3740	1 5155 1	TCF	ENCCFJCP
0397	REF 232	LAST	755	36,3741	10 0000 0	GETDT	CCS A
0398				36,3742	1 3745 0	TCF	+3
0399				36,3743	1 3745 0	TCF	+2
0400	REF 138	LAST	748	36,3744	3 4755 1	CAF	ZERO
0401	REF 83	LAST	714	36,3745	6 4753 1	AD	ONE
0402	REF 111	LAST	744	36,3746	56 001 0	XCH	L
0403	REF 139	LAST	756	36,3747	3 4755 1	CAF	ZERO
0404	REF 8	LAST	752	36,3750	52 517 1	CXCH	TCF
0405	REF 9	LAST	756	36,3751	3 1517 0	CA	TGC +1
0406	REF 198	LAST	744	36,3752	0 0002 0	TC	0

R0424 *****

0425				36,3753	00000 1	SEC15CP	OCT	00000	DON'T SEPARATE
0426				36,3754	02734 0	SEC15	FFC	1500	DON'T SEPARATE
0427				36,3755	00000 1	SEC30CP	2SEC	3000	
0427				36,3756	05670 0				
0428				36,3757	00000 1	SEC45CP	CCT	00000	DON'T MOVE FROM JUST BEFORE SEC45
0429				36,3760	10624 0	SEC45	DEC	4500	
0430				36,3761	00000 1	5SECP	CCT	00000	DON'T MOVE FROM JUST BEFORE 5SEC
0431				36,3762	00764 1	5SEC	DEC	500	
0432				36,3763	05050 1	26SECS	DEC	2600	
0437				36,3764	04050 0	V16N40	VN	1640	
0438				36,3765	04125 0	V16N858	VN	1685	
0439				36,3766	04123 0	V1682	VN	1683	
0440	REF 15	LAST	750	4777		SEC01	=	1 SEC	
0441	REF 2	LAST	741	36,2057		ACADNE5	=	P41TABLE +2	
0442	REF 7	LAST	752	07,1622				EBANK= DELVIMU	
0443	REF 1			36,3767	02466 0	ACADNE3	2CADR	CALCN83	
0443	REF 1			36,3770	04067 0				

R0444 *****

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R0445 PROGRAM DESCRIPTION S40.1 DATE15NOV66
 R0446 MOD NO2 LFG SECTION P40-P47
 R0447 MOD BY ZELCIN AND ADAPTED BY TALAYCO
 R0448 FUNCTIONAL DESCRIPTION
 R0449 COMPUTE INITIAL THRUST DIRECTION(UT) AND INITIAL VALUE OF VE
 R0450 VECTOR(VCTIG).
 R0451 CALLING SEQUENCE
 R0452 I CALL
 R0453 I+I S40.)
 R0454 NORMAL EXIT MODE
 R0455 AT L+2 OF CALLING SEQUENCE (GOTO L+2) NORMAL RETURN OR
 R0456 FORCE RETURN IF NOSOFLAG=1
 R0457 SUBROUTINES CALLED
 R0458 LAMPFC
 R0459 INITVEL
 R0460 CALCGRAM
 R0461 MIDGIN
 R0462 ALARM OR ABORT EXIT MODES
 R0463 L+2 OF CALLING SEQUENCE, UNSOLVABLE CONIC IF NOSOFLAG=1
 R0464 CRASABLE INITIALIZATION REQUIRED
 R0465 WEIGHT/G ANTICIPATED VEHICLE MASS CP B16KCM
 R0466 XDELVFC I=DELTA-V MANEUVER, 0=AIMPT STEER
 R0467 F THRUST FOR ENGINE USED
 R0468 IF DELTA-V MANEUVER
 R0469 DELVSIN SPECIFIED DELTA-V REQUIRED IN
 R0470 INERTIAL COORDS. OF ACTIVE VEHICLE
 R0471 AT TIME OF IGNITION VECTOR B7M/CS
 R0472 DELVSAB MAG. OF DELVSIN CP B7M/CS
 R0473 RTIG POSITION AT TIME OF IGNITION VECTOR B29M
 R0474 VTIG VELOCITY AT TIME OF IGNITION VECTOR B7M/CS
 R0475 IF AIMPT STEER
 R0476 TIG TIME OF IGNITION CP B28CS
 R0477 RTARG POSITION TARGET TIME VECTOR B29M
 R0478 CSTEER C FOR STEER LAW CP P2
 R0479 DTARG TARGET TIME-IGNITION TIME CP B28CS
 R0480 OUTPLT
 R0481 UT DESIRED THRUST DIRECTION VECT. B2M/(CS.CS)
 R0482 VCTIG INITIAL VALUE OF VELOCITY
 R0483 TO BE GAINED (INERT. COORDS.) VECTOR B7M/CS
 R0484 DELVVC VGTIG IN LFC. VERT. COORDS. B7M/CS
 R0485 RDT: V REQUIRED AT TIG -V REQUIRED AT (TIG-2SEC)
 R0486 -30T FOR S40.1? VECT B7M/CS
 R0487 RTIC CALC IN S40.1P(AIMPT) FOR S40.2,? VECTOR B29M
 R0488 POSITION AT TIME OF IGNITION
 R0489 DEFSIS QTEMP1
 R0490 MFAC, GPRET
 R0491 PLSHLIST
 R0492 14,2347 BANK 14
 R0493 P F 4 LAST 743 27,2200 SFTLCC P40S1
 R0494 27,2246 BANK

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0495	REF	1			27,2246	71220	1	S40.1	COUNT# 44/S40.1	
0496					27,2247	03622	0		STC	FLCAD
0497	REF	3	LAST	620	27,2247	03622	0			QTEMP
0498	REF	30	LAST	755	27,2250	03442	0			TIG
0498.1	REF	4	LAST	754	27,2251	03763	0		STORE	TIGSAVE
0499					27,2252	77614	1	DELVTEST	BOFF	
0500	REF	5	LAST	754	27,2252	01247	0			XDELVFLG
0501	REF	1			27,2254	56336	1			S40.1P
0502					27,2255	77201	1	CALCTHET	SETPD	VLOAD
0503					27,2256	00001	0			0
0504	REF	5	LAST	645	27,2257	03650	1			VTIG
0505	REF	8	LAST	754	27,2260	02331	1		STORE	VINIT
0506					27,2261	52425	0		VXV	UNIT
0507	REF	6	LAST	645	27,2262	03642	1			PTIG
0508	REF	3	LAST	145	27,2263	27673	0		STCVL	UT
0509	REF	7	LAST	758	27,2264	03642	1			FTIG
0510	REF	9	LAST	754	27,2265	02323	1		STORE	RINIT
0511					27,2266	65236	0		VSC	PDDL
0512					27,2267	00745	0			REF
0513					27,2270	56205	0		DMP	DEV
0514	REF	1			27,2271	16412	1			THETACCN
0515					27,2272	41205	0		DMP	DMP
0516	REF	4	LAST	648	27,2272	03664	0			DELVSAB
0517	REF	1			27,2274	01244	1			WEIGHT/G
0518					27,2275	77671	1		DEV	
0519	REF	6	LAST	751	27,2276	02735	0			F
0520					27,2277	24017	1		STCVL	140
0521	REF	13	LAST	752	27,2300	03656	1			DELVSIN
0522					27,2301	74241	0		CCT	VXSC
0523	REF	4	LAST	758	27,2302	03673	0			UT
0524	REF	5	LAST	758	27,2303	03673	0			LT
0525					27,2304	41552	0		VSL2	PLSH
0526					27,2305	65245	1		BVSU	PDDL
0527	REF	14	LAST	758	27,2306	03656	1			DELVSIN
0528					27,2307	00017	1			140
0529					27,2310	63356	1		SIN	PEVL
0530					27,2311	00007	0			60
0531					27,2312	53435	0		VXV	UNIT
0532	REF	6	LAST	758	27,2313	03673	0			UT
0533					27,2314	45561	1		VXSC	STADR
0534	REF	5	LAST	749	27,2315	50076	0		STCVL	VGTTIG
0535					27,2316	65256	0		UNIT	PDDL
0536					27,2317	00017	1			140
0537					27,2320	74346	0		CCS	VXSC
0538					27,2321	74255	0		VAD	VXSC
0539	REF	6	LAST	758	27,2322	03701	1			VGTTIG
0540					27,2323	00045	0			360
0541					27,2324	53252	0		VSL2	VAD
0542					27,2325	77620	0		STADR	

(DELTA V, UP) UP SCALED AT 2(+7) P.D.L. 0
 DELTA VP SCALED AT 2(+7) P.D.L. 6

UNIT(VPXLPI) SIN(THETAT/2) IN VGTIG.
 UNIT(DELTA VP) IN P.D.L. 6

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0543	REF	7	LAST	758	27,2326	74776 C	STORE	VG TIG	VG IGNITION SCALED AT 2(+7)M/CS
0544					27,2327	77656 1	UNIT		
0545	REF	7	LAST	758	27,2330	27673 C	STCVL	UT	THRUST DIRECTION SCALED AT 2(+1)
0546	REF	8	LAST	759	27,2331	03771 1		VG TIG	
0547					27,2332	45006 0	PUSH	CALL	
0548	REF	1			27,2333	15741 1		GET.LVC	VG TIG IN LV COOR AT 2(+7)M/CS IN DELV LVC
0549					27,2334	77650 1	COORD		
0550	REF	4	LAST	758	27,2335	03632 0		QTEMP	
0551					27,2336	77745 1	S40.18	DLCAD	
0552	REF	21	LAST	758	27,2337	73442 0		TIG	
0553	REF	42	LAST	726	27,2340	00041 1	STORE	TDECI	
0554					27,2341	77621 1	BDSU		
0555	REF	8	LAST	754	27,2342	03631 0		TPASS4	
0556	REF	7	LAST	754	27,2343	37452 0	STCALL	DEFLT4	INTERCEPT TIME - TIG.
0557	REF	7	LAST	717	27,2344	27760 1		LEMPREC	
0558					27,2345	49275 1	VLCAD	SETPD	LOAD STATE VECTOR AT TIG FOR INITVEL.
0559	REF	24	LAST	714	27,2346	00011 0		RATT	
0560					27,2347	00011 0		Q	
0561	REF	8	LAST	758	27,2350	03642 1	STORE	PTIG	
0562	REF	11	LAST	758	27,2351	12323 1	STORE	PINIT	
0563					27,2352	77656 1	UNIT		
0564	REF	2	LAST	148	27,2353	27537 0	STCVL	UNIT/P/	
0565	REF	23	LAST	714	27,2354	00017 0		VATT	
0566	REF	6	LAST	758	27,2355	03650 1	STORE	VTIG	
0567	REF	9	LAST	758	27,2356	02221 1	STORE	VINIT	
0568					27,2357	65345 1	DLCAD	PDDE	NUMIT = 0
0569	REF	11	LAST	677	27,2360	06224 1		ZPROVCS	
0570	REF	1			27,2361	16406 1		EPS1	
0571					27,2362	43214 1	PCFF	DAC	
0572	REF	4	LAST	754	27,2363	02745 1		ACFMSW	
0573	REF	1			27,2364	56364 1		SMALLEPS	
0574	REF	1			27,2365	16410 0		EPS2	EPSILEN4 = 10 DEGREES OR 45 DEGREES.
0575					27,2366	66776 1	SMALLEPS	PLSH	SXA,1
0576	REF	12	LAST	698	27,2367	02776 0		RTX1	
0577					27,2370	45134 0		SXA,2	CALL
0578	REF	11	LAST	696	27,2371	02777 1		RTX2	
0579	REF	2	LAST	674	27,2372	22111 1		INITVEL	
0580					27,2373	41575 1	VLCAD	PLSH	
0581	REF	11	LAST	696	27,2374	02266 0		DELVEET3	VG TIG = VR - VN.
0582	REF	5	LAST	750	27,2375	03701 1	STORE	VG TIG	
0583					27,2376	77656 1	UNIT		UT = UNIT (VG TIG)
0584	REF	9	LAST	754	27,2377	17673 0	STOOL	UT	
0585					27,2400	00045 0		360	
0586	REF	3	LAST	315	27,2401	37664 1	STCALL	VGDISP	CONVERT VG TIG (IN PUSHLIST) TO LOCAL
0587	REF	2	LAST	750	27,2402	15741 1		GET.LVC	VERTICAL COORDINATES.
0588					27,2403	77652 1	CTIC		
0589	REF	5	LAST	750	27,2404	03632 0		QTEMP	
0590					27,2405	00707 1	PS1	2DECI*	2.777777778 F-2* 10 DEGREES AT 1 REVOLUTION.
0591					27,2406	03634 1			

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0591	27,247	3770 0	FPS2	2CFC*	9.722222222	F-2*	35 DECPFFS AT 1 REVOLUTION.
0591	27,241	34344 0					
0592	27,2411	11024 1	THETACON	2DEC	.31831989	P-8	
0592	27,2412	13714 1					

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P0593 SUBROUTINE NAME: S41.2,3 MOD. NO. 3 DATE: APRIL 4, 1967

P0594 MODIFICATION BY: JONATHAN C. ACDELSTON (ACAMS ASSOCIATES)

P0595 MOD. NO. 4: JULY 18, 1967: PETER ADLER (MIT/IL)

P0596 MOD. NO. 5: OCTOBER 19, 1967: PETER ADLER (MIT/IL)

P0597 ORIGINALLY BY: SAYDAN Z LOIN (MIT INSTRUMENTATION LAB) AND RICHARD TALAYCO (SYSTEM DEVELOPMENT CORP)

P0599 S41.2,3 COMPUTES "POINTVSM" WHICH IS THE HALF-UNIT DESIRED THRUST VECTOR IN STABLE-MEMBER COORDINATES FROM "UT"
 P0601 WHICH IS THE SAME VECTOR IN REFERENCE COORDINATES. IT DETERMINES THE CORRECT VALUES FOR "SCAXIS" USING THE +X
 P0613 AXIS FOR DPS, APS, AND POS BURNS. THE "WINGS-LEVEL HEADS-UP" LM ORIENTATION IS THEN COMPUTED IN REFERENCE
 P0615 COORDINATES. THESE VECTORS ALSO DEFINE THE "PREFERRED IMU ORIENTATION". UPON COMPLETION OF THIS CALCULATION,
 P0617 THE "PREFERRED ATTITUDE COMPUTED" FLAG IS SET (PERATELG).

P0618 CALLING SEQUENCE:

A0609	L	CALL	INTERPRETIVE CALL.
A0610	L +1	S41.2,3	
A0611	L +2	(PRTURN)	GIMBAL ANGLE VECTOR IN MPAC.

P0612 SUBROUTINES CALLED: NONE.

P0613 NORMAL RETURN: L +2 (SEE CALLING SEQUENCE ABOVE).

P0614 ALARM/ABORT CODES: NONE.

P0615 INPLT:

P0616	1. PERSMMAT	MATRIX FROM REFERENCE TO STABLE-MEMBER COORDINATES SCALED AT 2.
P0618	2. UT	HALF-UNIT DESIRED THRUST DIRECTION.
P0619	3. RTIG	POSITION AT TIG IN REFERENCE COORDINATES.

P0621 OUTPUT:

P0622	1. : XSCREF :	WINGS-LEVEL HEADS-UP LM ORIENTATION
P0623	: YSCREF :	IN REFERENCE COORDINATES
P0624	: ZSCREF :	(PREFERRED IMU ORIENTATION).
P0625	2. POINTVSM	DESIRED THRUST DIRECTION IN STABLE-MEMBER COORDINATES.
P0627	3. SCAXIS	HALF-UNIT OF AXIS TO ALIGN IN STABLE-MEMBER COORDINATES.
P0629	4. PERATELG	INTERPRETIVE FLAG. ON: PREFERRED ORIENTATION COMPUTED; OFF: NOT COMPUTED.

P0631 DEPRIS: NONE.

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0632	REF	I		27,2413	77775 1	S40.2,3	COJNT* 14/S40.2			
0633				27,2414	03673 0		VLCAD	UT	UT: DESIRED THRUST DIRECTION (HALE-UNIT)	
0634	REF	9	LAST 759	27,2415	76521 0			VSLI	(PLT INTC TCF OF PUSH-CCWN-LIST.)	
0635				27,2416	11734 0			REFSMAT	TRANSFORM THRUST DIRECTION TO STAPLE-	
0636	REF	22	LAST 726	27,2417	27773 1			POINTVSM	MEMBER FROM REFERENCE COORDS (RESCALE).	
0637	REF	5	LAST 520	27,2420	06522 1			UNITX	SAVE FOR "VECPPOINT" ROUTINE (LEMMAN).	
0638	REF	6	LAST 584	27,2421	27765 0			SCAXIS	SCAXIS SET TO +X, FOR P40 AND P42 AND	
0639	REF	22	LAST 520						FOR P41 IF RCS NOT -X,+Y,-Y,+Z,-Z.	
0640	REF	17	LAST 762	27,2422	03673 0			UT	ASSUME +X BLFN ALWAYS, EVEN FOR RCS.	
0641	REF	1		27,2423	03677 0	PLLSX	STORE	XSCREF	XSCREF = UT (DESIRED THRUST DIRECTION.)	
0642				27,2424	52435 0			UNIT	RTIG = POSITION AT TIME-OF-IGNITION.	
0643	REF	5	LAST 759	27,2425	03642 1			RTIG	YSCREF = UNIT(UT * RTIG)	
06431				27,2426	46125 0			BFIZ		
06432				27,2427	00145 0			36D	TEST MAGNITUDE OF LT * RTIG	
06433	REF	1		27,2430	56441 1			FIXY	IF SMALL, USE UT * RTIG AS YSC	
06434				27,2431	45575 1	STORY	VLCAD	STADR		
0644	REF	1		27,2432	74162 1			YSCREF		
0645				27,2433	76435 1			VSLI	COMPUTE (YSCREF * XSCREF), BUT FOR A	
0646	REF	2	LAST 762	27,2434	13517 0			XSCREF	RIGHT HANDED SYSTEM, NEED (X CROSS Y).	
0647				27,2435	77575 0			VCOMP	ZSCREF = - (YSCREF * XSCREF)	
0648	REF	1		27,2436	07623 0			ZSCREF	= + (XSCREF * YSCREF)	
0649				27,2437	43414 1			RVO		
0650	REF	1		27,2440	01173 1			PERATELG		
0651				27,2441	47275 0	FIXY	VLCAD	VXV	IN THIS CASE,	
0652	REF	3	LAST 762	27,2442	03617 0			XSCREF	YSCREF = UNIT(XSCREF * VTIG)	
0653	REF	7	LAST 759	27,2443	03650 1			VTIG		
0654				27,2444	41456 0			PUSH		
06505				27,2445	77551 1			CCTC		
06516	REF	1		27,2446	56421 1			STORY		

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P1651 SUBROUTINE S4C.B

R1652 MODIFIED APRIL 3, 1968 BY PETER ADLER MIT/IL

R1653 DESCRIPTION

R1654 S4C.B UPDATES THE VELOCITY-TO-BE-GAINED VECTOR, VG, (AND FOR LAMBERT TARGETED FLIERS ALSO EXTRAPOLATES VC
 R1656 USING THE ROT VECTOR) COMPUTES THE TIME FOR ISSUING THE ENGINE OFF COMMAND, TGO, AND CALLS THE ROUTINE
 R1658 "FINDCOW", WHICH GENERATES STEERING COMMANDS FOR THE GAP.

P1659 CALLING SEQUENCE

R1660 L-1 CALL
 R1661 L S4C.B
 R1662 L+1 INTERPRETIVE RETURN

R1663 ALARM

R1664 IF VG . DELVREF IS NEGATIVE (VG AND DELVREF OVER 90 DEGREES APART), BYPASS TGO AND STEERING COMPUTATIONS
 R1666 AND SET ALARM 14.17. RETURN TO CALLER NORMALLY.

R1667 INPUT AND INITIALIZATION

R1668 VGPREV REFERENCE 2(7) M/CS
 R1669 DELVREF REFERENCE 2(7) M/CS
 R1670 PET REFERENCE 2(7) M/CS
 R1671 TDECAV TAIL-SEE TIME 2(28) CS
 R1672 XDELVFLC 1 = EXTERNAL DELTA-V; 0 = LAMBERT (AIMPOINT)
 R1673 STEERSW 1 = DO STEERING AND TGO COMPUTATIONS; 0 = VG UPDATE ONLY
 R1674 FIRSTFLC 1 = GONE TO LAMBERT AT LEAST ONCE; 0 = HAVEN'T GONE TO LAMBERT YET

R1676 NOTE: VGTIC EQUALS VGPREV

R1677 OUTPUT

R1678 STEERSW SEE INPUT
 R1679 IMPULSW 1 = ENGINE OFF IN TGO CENTISECONDS; 0 = CONTINUE FLIER
 R1680 TGO TIME TO CUT-OFF 2(28) CS
 R1681 SEE FINDCOW FOR STEERING OUTPUTS.

R1682 SUBROUTINE CALLED

R1683 FINDCOW

R1684 FEBRIS

R1685 KEACS, PUSHLIST

R1686 PFF 1

COUNT# 11/S4C.B

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0687					27,2447	77614	1	S4 .8	BCF		GENERATE VR IF ACT EXTERNAL DELTA-V BURN
0688	REF	6	LAST	758	27,2450	01347	0			XD LVFLC	
0689	REF	1			27,2451	56721	1			RASTERR1	
0690					27,2452	52375	1		VLCAD	VSL	
0691	REF	6	LAST	750	27,2453	12711	1			VGPREV	
0692	REF	3	LAST	751	27,2454	03527	1			DELVRFF	
0693	REF	3	LAST	754	27,2455	03717	1	VGA1N*	STORE	VG	VELOCITY TO BE GAINED SCALED AT 171M/CS
0694					27,2456	76521	0		MXV	VS11	
0695	REF	23	LAST	762	27,2457	01734	0			REFSMAT	
0696	REF	3	LAST	791	27,2460	13254	1		STORE	UNFC/2	
0707					27,2461	51575	1	RTTY	VLCAD	ABVAL	
0708	REF	4	LAST	764	27,2462	12717	1			VG	
0709	REF	4	LAST	759	27,2463	12664	0		STORE	VGRISP	
0710					27,2464	77201	1	TGOCALC	SETPD	VLCAD	
0711					27,2465	11011	0			0	
0712	REF	5	LAST	764	27,2466	02717	1			VG	
0713	REF	7	LAST	764	27,2467	27711	1		STORE	VGPREV	
0714	REF	4	LAST	764	27,2470	13527	1			DELVRFF	
0715					27,2471	57414	1		BCFF	VCCVP	
0716	REF	1			27,2472	11344	0			STERSW	
0717	REF	5	LAST	711	27,2473	11152	0			QPRET	
0718					27,2474	77656	1		UNIT		
0719					27,2475	41441	0		DOT	PUSH	
0720	REF	6	LAST	764	27,2476	12717	1			VG	
0721					27,2477	56244	0		BPL	DDV	
0722	REF	1			27,2501	56526	0			ALARMIT	DELV IS MORE THAN 50 DEGREES FROM VG.
0723	REF	2	LAST	747	27,2501	12742	1			VEX	
0724					27,2502	41215	1		CAD	DMP	
0725	REF	12	LAST	665	27,2503	16522	1			DPHALF	
0726					27,2504	56261	1		SR	DDV	
0727					27,2505	21613	1			100	
0728					27,2506	00045	0			360	
0729					27,2507	43215	1		DMP	DAD	
0730	REF	1			27,2511	16535	0			-FCURET	
0731	REF	1			27,2511	03741	0			TC CAY	
0732	REF	1	LAST	756	27,2512	03517	1		STORE	TGC	
0733					27,2513	77615	0		CAD		
0734	REF	18	LAST	754	27,2514	01224	0			PIPTIME	
0735	REF	32	LAST	759	27,2515	17442	0		STOOL	TIG	
0736	REF	11	LAST	764	27,2516	03517	1			TGC	
0737					27,2517	51125	1		DSU	RFL	
0738	REF	1			27,2520	16537	1			FCUPSECS	400 CS
0739	REF	1			27,2521	61076	1			FINDCUW -2	
0740					27,2522	43714	0		SET	CLRGD	
0741	REF	3	LAST	755	27,2523	01146	0			IMPULSW	
0742	REF	2	LAST	764	27,2524	01224	1			STEPSW	
0743	REF	6	LAST	764	27,2525	01152	0			QPRET	

0744 27,2526 77776 1 ALARMIT EXIT

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0745	REF	30	LAST	740	27,2527	05567 0	TC	ALARM	
0746					27,2530	1407 0	CCT	01407	
0747	REF	112	LAST	755	27,2531	06042 1	TC	INTPPET	
0748					27,2532	77650 1	GETC		
07495	REF	2	LAST	764	27,2533	61076 1		FINDCCW -2	SKIP TGC COMPUTATION BUT CALL FINDCCW. FINDCCW WILL EXIT TO UPDATEVG +3.
0749					27,2534	77715 1	-FOUPET	2FFC	-800 3-18
0749					27,2535	77777 0			-4 (200 CS.) B (-18)
0751					27,2536	00000 1	FOURSECS	2D-C	400
0751					27,2537	00620 0			400 CS SCALED AT 2(+28)CS
07515	REF	3	LAST	764	27,1742		2VEXHLST =	VEX	

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R0752 NAME S4.12 - TIME BURN
 R0753 FUNCTION (1) DETERMINE WHETHER A GIVEN COMBINATION OF VELOCITY TO
 R0754 BE GAINED AND ENGINE CHOICE RESULT IN A BURN TIME
 R0755 SUFFICIENT TO ALLOW STEERING AT THE VEHICLE DURING THE
 R0756 BURN
 R0757 (2) THE MAGNITUDE OF THE RESULTING BURN TIME -- IF IT
 R0758 IS SHORT -- AND THE ASSOCIATED TIME OF THE ENGINE OFF
 R0759 SIGNAL
 R0760 CALLING SEQUENCE VIA FINDVAC AS A NEW JCB
 R0761 INPUT VGTIC VELOCITY TO BE GAINED VECTOR (METERS/CS) AT +7
 R0762 WEIGHT/C MASS OF VEHICLE IN KGM AT +16
 R0763 F APS ENGINE THPST IN N. NEWTONS AT +7
 R0764 AND ALSO FOR RCS ENGINE
 R0765 MDCR PNT OF DECREASE OF VEHICLE MASS DURING ENGINE
 R0766 BURN IN KILOGRAMS/CS AT +3. THIS SCALING MAY
 R0767 REQUIRE MODIFICATION FOR SATURN BURNS.
 R0768 APSFLAG SWITCH TO DECIDE WHETHER APS OR DPS ENGINE IS USED
 R0769 =0 DPS
 R0770 =1 APS
 R0771 OUTPUT IMPULSW ZERO FOR STEERING
 R0772 ONE FOR ATTITUDE HOLD
 R0773 NCTHRCIL ZERO FOR THROTTLING
 R0774 ONE TO INHIBIT THROTTLING
 R0775 TCF TIME TO BURN IN CS
 R0776 THE QUANTITY M. NEWTON = 1000 NEWTONS WILL BE USED TO EXPRESS
 R0777 FORCE

0778	REF	12	LAST	764	27,1516		FRANK= TEC	
0779	REF	1					COLNT* \$1/40.13	
0780	REF	113	LAST	765	27,2540	6142 1	S4.12	TC
0781					27,2541	4300 1		INTPRFT
0782					27,2542	00 1 0		SLTFC
								CLFAP
								OOD
0783	REF	4	LAST	764	27,2543	01266 1		IMPULSW
0784					27,2544	5155 1		VLGAD
0785	REF	1	LAST	759	27,2545	03701 1		ARVAL
								VGTIC
0786					27,2546	41325 0		VELOCITY TO BE GAINED AT +7
0787	REF	1			27,2547	21 36 1		OOD = MAG OF VGTIC AT +7
0788	REF	2	LAST	749	27,2550	34021 0		4SEC(17)
								CORRECT VG FOR 4 SFCS OF 2 JET ULLAGE
								FRCS2
0789					27,2551	72471 0		SCALE
0790	REF	2	LAST	758	27,2552	01244 1		
0791					27,2553	41421 0		
0792					27,2554	42014 0		
0793	REF	1			27,2555	55342 1		
0794	REF	1			27,2556	56626 0		
0795	REF	2	LAST	747	27,2557	02463 1		
0796					27,2560	56345 1		
0797	REF	1			27,2561	16001 1		
0798	REF	3	LAST	766	27,2562	01244 1		
0799					27,2563	51121 1		

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0800				27,2564	000 1 0		MOD	
0801	REF	1		27,2565	56610 0		S40.131	TCO LESS THAN 100 CS
0802				27,2566	41325 0		DMP	02C = TEMP1 AT +7
0803	REF	2	LAST	144	27,2567	03737 1	MOD	

0804 MOD REPRESENTS THE RATE OF DECREASE OF VEHICLE MASS DURING ENGINE
 0805 PLUM IN KILOGRAMS/CS. WHEN SATURN IS USED, THE SCALING MAY
 0806 REQUIRE ADJUSTMENT

0807	REF	1		27,2570	16700 1		3.5SEC	350 CS AT +14
0808				27,2571	65221 0	BDSU	PDDL	
0809	REF	4	LAST	766	27,2572	01244 1	WEIGHT/G	
0810	REF	7	LAST	766	27,2573	03735 0	F	
0811				27,2574	63405 0	DMP	SD2	SCALE
0812	REF	1		27,2575	16702 0		5SECS	
0813				27,2576	41471 0	DDV	PLSH	04C = TEMP2
0814				27,2577	51021 0	BDSU	BPL	
0815				27,2600	00003 1		02C	
0816	REF	2	LAST	766	27,2601	56426 0	S40.130	
0817				27,2602	55345 0	ELCAC	PCPV	
0818				27,2603	43205 1	DMP	DAD	
0819	REF	2	LAST	767	27,2604	15702 0	5SECS	
0820	REF	1		27,2605	16676 1		15°C2C	100 CS AT +14
0821				27,2606	77650 1	GOTC		
0822	REF	1		27,2607	56616 0		S40.132	
0823				27,2610	41345 0	S40.131	ELCAC	
0824	REF	5	LAST	767	27,2611	01244 1	WEIGHT/G	
0825				27,2612	41542 1	SR1	PUSH	
0826				27,2613	56215 1	DAD	DDV	
0827	REF	1		27,2614	16 03 0		K2VAL	N. NEWTON CS AT +24
0828	REF	1		27,2615	16105 0		K3VAL	N. NEWTON CS AT +10
0829				27,2616	77414 0	S40.132	SFT	
0830	REF	5	LAST	766	27,2617	01065 0	IMPULSW	
0831	REF	9	LAST	766	27,2620	0 7262 0	S40.132*	TC
0832	REF	300	LAST	766	27,2621	3 0154 1	CA	MPAC
0833	REF	112	LAST	766	27,2622	56 001 0	XCH	L
0834	REF	140	LAST	766	27,2623	3 4755 1	CA	ZERC
0835	REF	13	LAST	766	27,2624	53 517 1	EXCH	TCO
0836	REF	1		27,2625	1 2650 1		TCF	S40.134

0837				27,2626	41345 0	S40.130	DLQAD	DMP	FOR DFS ENGINE
0838				27,2627	01001 0			MOD	
0839	REF	6	LAST	767	27,2630	01244 1		WEIGHT/G	
0840				27,2631	43006 0		PUSH	PCN	
0841	REF	2	LAST	766	27,2632	05302 0		APSELAG	
0842	REF	1		27,2633	56671 1			APSTGC	
0843				27,2634	43071 0		DDV	CLFAR	
0844	REF	1		27,2635	16107 1			S40.136	
0845	REF	3	LAST	766	27,2636	02663 0		ACTHRECTL	
0846				27,2637	41400 0		PCV	PUSH	

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0847	REF	1		27,264	56653	1		S40.137	CSU	S40.137V	
0848				27,2641	51025	1				RFI	
0849	REF	1		27,2642	16704	0				6SFC	600.0 CS AT +14
0850	REF	1		27,2642	56661	0				S40.138	
0851				27,2644	52115	1			CAD	GCTO	
0852	REF	2	LAST	766	27,2645	16704	0			6SFC	
0853	REF	2	LAST	767	27,2646	56516	0			S40.132	
0854					27,2647	77776	1	S40.133	EXIT		
0855	REF	49	LAST	752	27,2650	52553	1	S40.134	TC	PHASCHNG	
0856					27,2651	00003	1		CCT	00003	
0857	REF	124	LAST	756	27,2652	01550	0		TC	FNDCJFF	
0858					27,2653	40545	1	S40.137V	LOAD	SP4	RECCMPUTE TGC IN TIME2 UNITS
0859					27,2654	77671	1		EDV		
0860	REF	1			27,2655	16011	0			S40.136	S40.136 SHIFTED LEFT 10
0861	REF	14	LAST	767	27,2656	03517	1		STORE	TGT	
0862					27,2657	77776	1		EXIT		
0863	REF	2	LAST	767	27,2660	12650	1		TCF	S40.134	REJCIN COMMON CODING FOR RESTART PROTECT

0864					27,2661	51025	1	S40.138	CSU	RPL	
0865	REF	1			27,2662	16706	1			89SECS	
0866	REF	1			27,2663	56666	1			STORETGC	
0867					27,2664	77614	1		SET		
0868	REF	4	LAST	767	27,2665	02463	1			NOTHRTL	
0869					27,2666	77745	1	STORETGC	CLDAD		LOAD TGE AT 2(14)
0870					27,2667	77776	1		EXIT		
0871	REF	1			27,2670	12620	0		TCF	S40.132*	

0872					27,2671	62471	1	AFSTGC	EDV	SL2	
0873	REF	2	LAST	751	27,2672	34007	1			FAFS	
08735					27,2673	77650	1		GNTC		
0874	REF	2	LAST	768	27,2674	56667	0			STORETGC +1	
0878					27,2675	00144	0	1SEC2D	2DFC	100.0 B-14	100.0 CS AT +14
0878					27,2676	00000	1				
0879					27,2677	01274	1	3.5SEC	2DFC	350.0 B-13	350 CS AT +13
0879					27,2700	00000	1				
0880					27,2711	00764	1	5SECS	2DEC	500.0 B-14	500.0 CS AT +14
0880					27,2712	00000	1				
0881					27,2713	01130	1	6SFC	2DFC	600.0 B-14	600.0 CS AT +14
0881					27,2714	00000	1				
0886					27,2715	01304	0	89SECS	2DEC	890.0 B-14	
0886					27,2716	00000	1				

R0888	FUNCTION	(1) GENERATES REQUIRED VELOCITY AND VELOCITY-TO-BE-GAINED
R0889		VECTORS FOR USE DURING AIMPOINT MANEUVERS EVERY TWO
R0890		COMPUTATION CYCLES (4 SECONDS).
R0891		(2) UPDATES THE P VECTOR WHICH IS USED IN THE FINAL
R0892		CALCULATION OF EXTRAPOLATING THE VELOCITY-TO-BE-GAINED
R0893		THROUGH ONE 2-SECOND INTERVAL INTO THE FUTURE.
R0894	CALLING SEQ	VIA FINDVAC AS NEW JOB.
R0895	INFLT	RN - ACTIVE VEHICLE RADIUS VECTOR IN METERS AT +25.
R0896		VM - ACTIVE VEHICLE VELOCITY VECTOR IN METERS/CS AT +7

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R0897	VOPREV	- LAST COMPUTED VELOCITY REQUIRED VECTOR IN METERS/CS AT +7.
R0898		
R0899	TIC	- TIME OF IGNITION IN CS AT +28.
R0900	DLTARG	- COMPUTATION CYCLE INTERVAL = 200 CS AT +28.
R0901	PIPTIME	- TIME OF RN AND VN IN CS AT +28.
R0902	GDT/2	- HALF OF VELOCITY GAINED IN DELTA T TIME DUE TO ACCELERATION OF GRAVITY IN METERS/CS AT +7.
R0903	DELVOPF	- CHANGE IN VELOCITY DURING LAST 2 SEC IN METERS/CS AT +7.
R0904		
R0906	DLTPLT	- VELOCITY TO BE GAINED VECTOR IN METERS/CS AT +7.
R0907	VGDISE	- MAG OF VOPREV FOR DISPLAY PURPOSES.
R0908	VPPREV	- VELOCITY REQUIRED VECTOR IN METERS/CS AT +7.
R0909	RDT	- R VECTOR IN METERS/CS AT +7.
R0910	SUPPLINES USED -	INITIAL
CS11	REF 8 LAST 764	EPANK= VOPREV
0912	REF 2 LAST 44 TO 44:	2 2# COUNT# 44/S40.9
0913	REF 114 LAST 766	27,2717 56342 1 S40.9 TC INTPPT
0914		27,2718 77601 0 SETED
0915		27,2711 00 1:0 QCD
0925		27,2712 71214 0 SET DLAD
0926	REF 6 LAST 751	27,2712 11072 0 AVFLAC. SFT AVFLAG FOR LEM ACTIVE
0927	REF 6 LAST 752	27,2714 16524 1 HIAZEPDS
0928		27,2715 77725 1 FDDL
0929	REF 2 LAST 755	27,2716 16406 1 EPS1
0930		27,2717 43214 1 POFF DAD EPSILON4 = 10 OR 45 DEGREES.
0931	REF 6 LAST 755	27,2720 03745 1 ACRMSW
0932	REF 1	27,2721 56722 1 EPSMALL
0933	REF 2 LAST 759	27,2722 16410 0 EPS2
0934		27,2722 45006 0 EPSMALL FLSE
0935	REF 1	27,2724 22102 0 CALL
0936		27,2725 77776 1 HAVEGLFS
0937	REF 6 LAST 768	27,2726 05353 1 ENES40.9 EXIT
0938		27,2727 00002 1 TC PHASCHNG
0939	REF 125 LAST 768	27,2727 15155 1 GCT 2
		TCF ENDOFJOB
0940		27,2731 51575 1 PASTPER1
0941	REF 9 LAST 754	27,2732 01220 0 VLOAD ARVAL
0942		27,2733 53144 0 RN
0943	REF 12 LAST 759	27,2734 02777 1 LXC,2 SL*
0944		27,2735 57576 1 RTX2
0945	REF 2 LAST 144	27,2736 27715 1 0,2 RMAG
0946	REF 6 LAST 690	27,2737 03444 0 STCVL
0947		27,2740 47.51 0 VSL
0948	REF 9 LAST 765	27,2741 01220 0 RTARG
0949	REF 3 LAST 705	27,2742 21725 1 RTP
0950	REF 1	27,2742 17656 1 NCRMUNX1
0951		27,2744 00045 0 STCDL
0952		27,2746 53674 1 IC
0953	REF 15 LAST 688	27,2746 01046 1 360 C(360) = ABVAL(C)
		XAF,2 SL*
		X1

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0954					27,2747	57576 1		0,2
0955					27,275	18027 0	STORE	300
0956					27,2751	41311 0	NORM	DMP
0957	REF	12	LAST	714	27,2752	00151 1		X2
0958	REF	3	LAST	769	27,2753	13715 1		RMAG
0959					27,2754	57101 0	NORM	XAD,2
0960	REF	14	LAST	769	27,2755	00047 1		X1
0961	REF	17	LAST	770	27,2756	11046 0		X1
0962					27,2757	77734 1	SXA,2	
0963	REF	1			27,2760	03760 0		MUSCALE
0964	REF	2	LAST	144	27,2761	17725 1	STOPL	RIC
0965					27,2762	00037 0		300
0966					27,2763	65342 1	SRI	PDDL
0967	REF	4	LAST	770	27,2764	13715 1		RMAG
0968					27,2765	65342 1	SRI	PDDL
0969	REF	4	LAST	686	27,2766	03723 1		RTMAG
0970					27,2767	43342 0	SRI	CAC
0971					27,2770	45415 0	CAC	STADP
0972	REF	1			27,2771	74044 1	STORE	SS
0973					27,2772	41225 1	DSL	DMP
0974					27,2773	00037 0		300
0975	REF	3	LAST	690	27,2774	13721 0		MU/A
0976					27,2775	77621 1	BDSL	
0977	REF	2	LAST	690	27,2776	13717 0		MUASTEER
0978					27,2777	45325 1	PDDL	DSL
0979	REF	2	LAST	770	27,2778	03733 0		SS
0980	REF	5	LAST	770	27,3001	13715 1		RMAG
0981					27,3002	71511 1	ACPM	SRI
0982	REF	18	LAST	770	27,3003	00047 1		X1
0983					27,3004	41271 0	DDV	DMP
0984	REF	2	LAST	770	27,3005	03725 1		RIC
0985					27,3006	53664 0	XSU,2	SL*
0986	REF	15	LAST	770	27,3007	00046 0		X1
0987					27,3008	57575 1		1,2
0988					27,3009	77754 1	LXA,2	
0989	REF	2	LAST	770	27,3012	13766 0		MUSCALE
0990					27,3013	75366 0	SQRT	SIGN
0991	REF	3	LAST	688	27,3014	12673 1		GEOMSEN
0992					27,3015	00041 1	STORE	320
0993					27,3016	41345 0	DLCAD	DMP
0994	REF	2	LAST	770	27,3017	13733 0		SS
0995	REF	4	LAST	770	27,3020	03721 0		MU/A
0996					27,3021	77621 1	BDSL	
0997	REF	4	LAST	770	27,3022	13717 0		MUASTEER
0998					27,3023	45325 1	PDDL	DSL
0999	REF	4	LAST	770	27,3024	13733 1		SS
1000	REF	5	LAST	770	27,3025	13723 1		RTMAG
1001					27,3026	70501 1	NORM	SRI
1002	REF	20	LAST	770	27,3027	00047 1		X1
1003					27,3030	41271 0	DDV	DMP

2(+58 -X)

SS = (R1 + R2 + C) / 2

+ CP - A

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1004	REF	4	LAST	770	27,3031	13725 1		RIC	
1005					27,3032	52664 1	XSL,2	SL*	
1006	REF	21	LAST	771	27,3032	00046 0		X1	
1007					27,3034	57575 1		1,2	
1008					27,3035	65266 1	SQRT	PDDL	-P (NO SIGN)
1009	REF	5	LAST	770	27,3036	03733 0		SS	
1010					27,3037	56225 1	DSL	DDV	
1011					27,3040	00037 0		300	
1012	REF	6	LAST	771	27,3041	03733 0		SS	
1013					27,3042	41566 1	SQRT	PLSH	
1014					27,3042	67542 0	SR1	ASIN	
1015					27,3044	65205 0	EMP	PDDL	
1016	REF	1			27,3045	17216 1		2PI+3	
1017					27,3046	56325 0	PDDL	DDV	
1018					27,3047	00037 0		300	
1019	REF	7	LAST	771	27,3051	03733 0		SS	
1020					27,3051	77600 1	PCV		
1021					27,3052	57052 0		+1	
1022					27,3052	41366 1	SQRT	DMP	
1023					27,3054	44242 0	SR3	BFSU	
1024					27,3055	65265 1	SIGN	PDDL	
1025	REF	4	LAST	771	27,3056	07673 1		GEOMSGN	
1026	REF	2	LAST	771	27,3057	17216 1		2PI+3	
1027					27,3060	45202 1	SR2	DSU	
1028					27,3061	65205 0	EMP	PDDL	
1029	REF	8	LAST	771	27,3062	03733 0		SS	
1030	REF	5	LAST	771	27,3063	03733 0		SS	
1031					27,3064	75442 1	SR3	SQRT	
1032					27,3065	77605 1	DMP		
1033					27,3066	52525 1	PDDL	SL3	
1034	REF	5	LAST	770	27,3067	02717 0		MUASTEER	
1035					27,3070	55366 1	SQRT	BOLV	
1036					27,3071	43225 0	DSU	PAC	
1037	REF	9	LAST	759	27,3072	07621 0		TFASS4	
1038	REF	9	LAST	764	27,3073	01234 0		PIPTIME	
1039					27,3074	14037 0	STEEL	300	
1040					27,3075	77765 0	SIGN		
1041					27,3076	00037 0		300	B WITH SIGN
1042					27,3077	00037 0	STORE	300	
1043					27,3078	77214 0	RCN	VLCAD	
1044	REF	6	LAST	769	27,3081	03735 0		NCFMSW	
1045	REF	1			27,3082	57122 0		18 MESS	
1046	REF	2	LAST	769	27,3083	03656 1		IC	
1047					27,3084	53451 1	VSL	UNIT	
1048	REF	3	LAST	759	27,3085	02527 0		UNIT/P/	
1049					27,3086	63361 0	VXSC	PDDL	
1050					27,3087	00037 0		300	
1051	REF	3	LAST	771	27,3088	03656 1		IC	
1052					27,3089	53455 0	VAF	UNIT	
1053	REF	4	LAST	771	27,3090	02537 0		UNIT/F/	

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1054				27,3113	53301 0	GETVPG1 VXSC	VAD		
1055				27,3114	00041 1		320		
1056				27,3115	53744 0	GETVPG2 LXC,2	VSP#		
1057	REF	12	LAST	765	27,3116	02777 1	RTX2		
1058					27,3117	57177 1	0 -1,2		
1059	REF	7	LAST	690	27,3120	02347 1	STORE	VIPRIME	
1060					27,3121	77650 1	GCTC		
1061	REF	1			27,3122	57166 1		ASTREND-2	
1062					27,3123	53375 0	187MESS	VLCAD	DCT
1063	REF	4	LAST	771	27,3124	02656 1		IC	
1064	REF	5	LAST	771	27,3125	02537 0		UNIT/R/	
1065					27,3126	77240 1	EMA	VLCAD	
1066	REF	1			27,3127	57146 0		NEGPRCD	
1067	REF	5	LAST	772	27,3130	03656 1		IC	
1068					27,3131	62362 0	VSP1	PDVL	
1069	REF	6	LAST	772	27,3132	03537 0		UNIT/R/	
1070					27,3133	53362 0	VSP1	VAD	
1071					27,3134	77656 1	UNIT		
1072					27,3135	57406 1	PUSH	VCOMP	FCR A
1073					27,3136	75235 1	VXV	SIGN	
1074	REF	4	LAST	687	27,3127	02674 0		UN	
1075	REF	5	LAST	771	27,3140	02673 1		GEUMSCN	
1076					27,3141	74256 0	UNIT	VXSC	
1077					27,3142	00037 0		320	
1078					27,3143	77715 1	PDVL		UNIT(1C-1R) +R
1079					27,3144	77650 1	GCTC		
1080	REF	1			27,3145	57113 0		GETVPG1	
1081					27,3146	74575 0	NEGPRCD	VLCAD	VSP1
1082	REF	7	LAST	772	27,3147	02537 0		UNIT/P/	
1083					27,3150	74515 0	PDVL	VSP1	
1084	REF	4	LAST	772	27,3151	02656 1		IC	
1085					27,3152	53451 1	VSI	UNIT	
1086					27,3153	77696 1	PUSH		
1087					27,3154	75235 1	VXV	SIGN	
1088	REF	5	LAST	772	27,3155	02674 0		UN	FCR B
1089	REF	6	LAST	772	27,3156	02673 1		GEUMSCN	
1090					27,3157	74256 0	UNIT	VXSC	
1091					27,3158	00041 1		320	
1092					27,3161	77715 1	PDVL		
1093					27,3162	53361 0	VXSC	VAD	
1094					27,3163	00037 0		320	
1095					27,3164	77650 1	GCTC		
1096	REF	1			27,3165	57115 0		GETVPG2	
1097					27,3166	77651 0	VSL		
1098	REF	3	LAST	727	27,3167	02552 1		VN1	
1099	REF	12	LAST	759	27,3170	02366 0	ASTRENE	STORE	DELVEFT3
1100					27,3171	53135 0	FIRSTIME	SLCAD	RZF
1101	REF	14	LAST	772	27,3172	03000 1		RTX2	
1102	REF	1			27,3173	57177 1		CFTCPPL	
1103					27,3174	52175 0	VLCAD	GCTC	NO FLATNESS COMP IF IN MOON SPHERE

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LSEP'S PAGE NO. 29 E7 S3

1104	REF	13	LAST	772	27,2175	02366 0		DELVEFT3	
1105	REF	1			27,2176	57212 1		NOGOBL	
1106					27,2177	53575 0	GETGOBL	VLOAD	CALCULATE RELATNESS TERM.
1107	REF	10	LAST	769	27,2200	01220 0		SA	
1108					27,2201	45245 1		DICAD	
1109	REF	10	LAST	771	27,2202	01234 0		PIPTIME	
1110	REF	3	LAST	725	27,2203	03512 1		GCPLTIME	$G = - (PU/R)^2 (UNITGOBL)(T - TIG)$
1111					27,2204	56205 0	DMF	DDV	CBL
1112	REF	1			27,2205	16123 1		FAFTMU	
1113					27,2206	00043 0		34C	$34C = /PA/ (2) FROM UNIT OPERATION.$
1114					27,2207	53361 0		VXSC	
1115	REF	1			27,2210	03521 1		UNITGOBL	
1116	REF	14	LAST	773	27,2211	02366 0		DELVEFT3	CUTPLT FROM INITVEL $VG = VR - VN$
1117	REF	15	LAST	773	27,2212	02366 0	NOGOBL	STORE	$VG = VR + GCHL - VN$
1118					27,2213	77650 1	GTIC		
1119	REF	1			27,2214	56455 0		VGAIN*	

1120					27,2215	31113 1	2P1+3	2CFC	3.141692653 B-2
1121					27,2216	36652 0			

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R1121 TRIMTIME (FORMERLY S40.6)
 R1122 MCF C 24 FEB 67 PETER ADLER
 R1123 FUNCTION:

R1124 TRIMS FPS ENGINE TO MINIMIZE THRUST/CG OFFSET. ENGINE IS GIMBALED TO FULL + PITCH AND + ROLL (TO LOCK)
 R1126 FOR REFERENCE AND IS THEN BROUGHT BACK TO TRIM POSITION BY RUNNING FOR THE PROPER TIMES (TO BE
 R1128 SPECIFIED BY GAP) IN - PITCH AND - ROLL.

R1129 CALLING SEQUENCE:
 R1130 VIA WAITLIST FROM R03

R1131 INPUT:
 R1132 PITCHTIME TIME TO RUN FROM FULL + PITCH TO TRIM (CS)
 R1133 ROLLTIME TIME TO RUN FROM FULL + ROLL TO TRIM (CS)
 R1134 SUBROUTINES USED:

R1135 WAITLIST, FIXDELAY, VARDELAY, FLAGUP, FLAGDOWN, NOVAC

1136 RFF 1 COLN# 48/S4).6

1137 RFF 3 LAST 315 56,1401 EBANK= ROLLTIME

OCTAL MASKS: PRIC5=05000 EBANK5=02400

1138 RFF 80 LAST 755 27,3217 0 5515 0 TRIMTIME TC DOWNFLAG

CMBCRVSW FLAG IS SET WHEN EITHER ROLL OR

1139 RFF 1 27,3220 0 137 1 ADRES GMPDEFVSW

PITCH IS COMPLETED, WHICHEVER IS FIRST.

1140 RFF 8 LAST 750 27,3221 4 5017 0 CS PRI05

TURN OFF - PITCH, - ROLL, IF CN.

1141 27,3222 0 0006 1 EXTEND

1142 RFF 44 LAST 609 27,3223 0 0012 1 WAND CHAN12

1143 RFF 3 LAST 598 27,3224 2 5014 1 CAF EBANK5

TURN ON + PITCH, + ROLL.

1144 27,3225 0 0006 1 EXTEND

1145 RFF 45 LAST 774 27,3226 0 5012 1 WCR CHAN12

1146 RFF 14 LAST 752 27,3227 0 5221 0 TC FIXDELAY

WAIT ONE MINUTE TO MAKE SURE ENGINE IS

1147 27,3228 13560 0 CFC 6000

AT FULL + PITCH AND FULL + ROLL

1148 RFF 4 LAST 774 27,3231 4 5014 0 CS EBANK5

TURN OFF + PITCH, + ROLL.

1149 27,3232 0 0006 1 EXTEND

1150 RFF 46 LAST 774 27,3233 0 0012 1 WAND CHAN12

1151 RFF 9 LAST 774 27,3234 3 5017 1 CAF PRI05

TURN ON - PITCH, - ROLL.

1152 27,3235 0 0006 1 EXTEND

1153 RFF 47 LAST 774 27,3236 0 5012 1 WCR CHAN12

1154 RFF 2 LAST 315 27,3237 31 4012 0 CAF PITCHTIME

GET TIME TO SHUT OFF - PITCH AND SET UP

1155 RFF 20 LAST 755 27,3240 0 5173 1 TC TWIDDLE

TWIDDLE-TASK TO TURN IT OFF THEN

1156 RFF 1 27,3241 0 3260 0 ADRES PITCHOFF

1157 RFF 4 LAST 774 27,3242 31 4011 0 CAF ROLLTIME

GET TIME TO SHUT OFF - ROLL AND GO AWAY

1158 RFF 6 LAST 608 27,3243 0 5224 0 TC VARDELAY

UNTIL THEN

1159 RFF 26 LAST 706 27,3244 4 4740 0 CS BIT12

1160 27,3245 0 0006 1 EXTEND

1161 RFF 48 LAST 774 27,3246 0 0012 1 WAND CHAN12

1162 RFF 2 LAST 707 27,3247 3 0012 1 ROLLCOVER CA FLAGWPC6

SHUT OFF ROLL IF HERE IN LINE (ROLL DONE) IS PITCH DONE

1163 RFF 1 27,3250 7 4742 0 MASK GMPDEFIT

IF HERE FROM PITCHOFF, IS ROLL DONE?

1164 27,3251 0 0006 1 EXTEND

1165 RFF 2 LAST 774 27,3252 1 3264 0 PZF PITCHOFF +4

NO. SET FLAG, ROLL OR PITCH DONE.

1166 RFF 5 LAST 754 27,3253 2 4737 0 CAF PRI05

RETURN TO R03

1167 RFF 20 LAST 736 27,3254 0 5072 1 TC NOVAC

1168 RFF 2 LAST 596 27,1471 EBANK= WPCARES

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1169	REF	1		27,3255	0 2325 1	20ADR	TRIMDCNE	
1169	REF	1		27,3256	0 2267 1			
1170	REF	53	LAST 754	27,3257	0 5261 1	TC	TASKOVER	
1171	REF	20	LAST 609	27,3258	4 4742 0	PITCHOFF CS	PITCH	
1172				27,3261	0 2246 1	EXTEND		
1173	REF	49	LAST 774	27,3262	0 3012 1	WAND	CHAN12	SHUT OFF PITCH
1174	REF	1		27,3263	1 2247 1	TCF	ROLLOVER	SEE IF ROLL HAS FINISHED ALSO.
1175	REF	52	LAST 755	27,3264	0 5504 0	TC	UPFLAG	ROLL DONE; OR PITCH DONE; BUT NOT BOTH.
1176	REF	2	LAST 774	27,3265	0 2137 1	ADRES	GMADRVSW	
1177	REF	54	LAST 775	27,3266	0 5261 1	TC	TASKOVER	

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P1178 SUBROUTINE NAME: S41.1 MOD. NO. 0 DATE: FEBRUARY 28, 1967

R1179 MOD. NO. 1 DATE: JANUARY 23, 1968: BY PETER ADLER (MIT/IL)

R1181 AUTHOR: JONATHAN D. ADDELSTON (ADAMS ASSOCIATES)

R1182 S41.1 PERFORMS THE COORDINATE SYSTEM TRANSFORMATION FROM THE REFERENCE FRAME TO THE BODY OF THE LM.
 R1184 SPECIFICALLY, IT IS USED TO TRANSFORM A VELOCITY (SCALED AT 2(+7) METERS/CENTISECOND) FROM REFERENCE TO LM AXIS
 R1186 COORDINATES. FIRST THE VECTOR IS TRANSFORMED TO THE STABLE MEMBER COORDINATES BY THE MATRIX REFSMMAT. THIS
 R1188 LEAVES THE VECTOR IN MPAC, SCALED AT 2(+8) METERS/CENTISECOND. THEN
 R1189 THE SUBROUTINE COUTPIC IS CALLED TO SET UP THE DOUBLE-PRECISION CDU VECTOR ALONG WITH ITS SINES AND COSINES.
 R1191 THE VECTOR IS THEN TRANSFORMED FROM STABLE MEMBER COORDINATES TO SPACECRAFT (OR LM) COORDINATES BY THE
 R1193 SUBROUTINE *SNAP*. FINALLY THE VECTOR IS RESCALED TO 2(+7) METERS/CENTISECOND, AND CONTROL IS RETURNED TO THE
 R1195 CALLED WITH C(MPAC) = VELOCITY(LM).

R1196 CALLING SEQUENCE:

A1197	L	VLCAD	CALL	
A1198	L +1		VELOCITY(RFF)	SCALED AT 2(+7)M/CS IN REFERENCE COORDS.
A1199	L +2		S41.1	
A1200	L +3	STORE	VELOCITY(LM)	SCALED AT 2(+7)M/CS IN LM BODY AXIS SYS.

R1201 SUBROUTINES CALLED:

R1202 1. COUTPIC,
 R1203 WHICH CALLS COLLEBIC.
 R1204 2. *SNAP*

R1205 NORMAL RETURN: L +3 (SEE CALLING SEQUENCE, ABOVE.)

R1206 ALARM/ABORT MODES: NONE.

R1207 RESTART PROTECTION: NONE.

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P1218 INPUT:

P1219 1. PREFSMAT.
 P1211 2. CDUX, CDUY, CDUZ.
 P1211 3. VELOCITY (REF) IN MPAC.

P1212 OUTPUT:

P1213 1. CDUSPCT: DOUBLE PRECISION CDU VECTOR, ORDERED Y,Z,X.
 P1214 2. SINGCU: HALF SINES OF CDUSPCT COMPONENTS.
 P1215 3. COSCCL: HALF COSINES OF CDUSPCT COMPONENTS.
 P1216 4. MPAC: VELOCITY(LM) (SCALED AT 2(+7) METERS/CENTISECOND)

P1217 DEPRIS: NONE.

P1219 CHECKOUT STATUS: CODED.

1219	REF	1					COUNT* 14/S41.1	
1221				27,2267	76521 0	S41.1	MXV	VSL1
1221	REF	24	LAST	764	27,2270	01734 0		PREFSMAT
1222				27,2271	77652 1		CCTC	
1223	REF	2	LAST	520	27,2272	47656 1		CDU*SMNB
A1224								

CONVERT VECTOR IN MPAC FROM REF AT 2(+7)
 TO SM AND RESCALE DUE TO HALFUNIT MATRIX
 CONVERT TO BODY AT 2(+7) USING PRESENT
 CPU ANGLES. CDU*SMNB WILL RETURN
 VIA RVQ TO THE CALLER OF S41.1

1 THE LUNAR LANDING

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0001 32,2777 BANK 32
 0002 PFF 2 LAST 602 32,2777 SETLCC F2DPS*32
 0013 32,2777 BANK

0004 PFF 1 F7,1621 ERANK= E2DPS

P0105 *****
 P0106 P63: THE LUNAR LANDING, BRAKING PHASE
 P0007 *****

COUNT* 11/P63

0008 PFF 1
 0009 PFF 51 LAST 769 32,2777 0 5353 1 P63LN TC PHASCHNG
 0010 32,3000 04,24 0 ECT 04,24

0011 PFF 212 LAST 752 32,3001 0 4616 1 TC BANKCALL DO IML STATUS CHECK ROUTINE P02
 0012 PFF 8 LAST 751 32,3002 11236 0 CDR R02PCTH

0013 PFF 1 32,3003 2 3254 1 CAF P63ADPES INITIALIZE WHICH FOR BURNEABY
 0014 PFF 20 LAST 751 32,3004 55,455 0 TS WHICH

00141 PFF 1 32,3005 2 2000 0 CAF DFSTHRS INITIALIZE CVMON
 00142 PFF 4 LAST 751 32,3006 55,250 0 TS DVTHRLSH
 00143 PFF 13 LAST 751 32,3007 3 4751 0 CAF FCUP
 00144 PFF 20 LAST 755 32,3010 55,515 0 TS FVCMTR

0015 PFF 44 LAST 756 32,3011 4 4753 0 CS ONF INITIALIZE WCHPHASE AND FLPASSC
 0016 PFF 2 LAST 731 32,3012 55,346 0 TS WCHPHASE

0017 PFF 141 LAST 767 32,3013 3 4755 1 CA ZERO
 00175 PFF 3 LAST 731 32,3014 55,523 0 TS FLPASSC

0018 PFF 56 LAST 605 32,3015 4 4726 0 CS BIT14
 0019 32,3016 0 0056 1 EXTEND

0020 PFF 50 LAST 775 32,3017 03 012 1 WAND CHAN12 REMOVE TRACK-ENABLE DISCRETE.

0023 PFF 115 LAST 769 32,3020 0 6042 1 FLAGRGY TC INTERPT DICKYSIAN FLAG WAVING
 0024 32,3021 43 014 0 CLEAR CLEAR

0025 PFF 5 LAST 748 32,3022 02663 0 ACTHRTL

0026 PFF 1 32,3023 03271 0 REDFLAG

0030 32,3024 43 014 0 CLEAR SET

0031 PFF 1 32,3025 05661 1 LRYPASS

0032 PFF 4 LAST 726 32,3026 02747 0 MFLAG

0033 32,3027 43 014 0 CLEAR CLEAR

0034 PFF 2 LAST 504 32,3030 02266 0 P25FLAG TERMINATE P25 IF IT IS RUNNING.
 0035 PFF 5 LAST 569 32,3031 00270 1 RNDVZFLG TERMINATE P20 IF IT IS RUNNING

A0076

0037 32,3032 77201 1 IGNALG SETPD VLCAD

FIRST SET UP INPUTS FOR RF-TC-R:-

L THE LUNAR LANDING

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0038					32,3033	00011 1			AT 60 LANDING SITE IN MOON FIXED FRAME
0039	REF	5	LAST	717	32,3034	0223 1			AT 60 ESTIMATED TIME OF LANDING
0040					32,3035	41525 0	PDDL	PUSH	MEAC NON-ZERO TO INDICATE LUNAR CASE
0041	REF	3	LAST	201	32,3036	02401 0		TLANC	
0042	REF	2	LAST	157	32,3037	37625 1	STCALL	TRIP	ALSO SET TRIP FOR FIRST GUIDANCE PASS
0043	REF	1			32,3040	55716 1		RF-TC-R	
0044					32,3041	64312 0	VSL4	MXV	
0045	REF	25	LAST	777	32,3042	01734 0		REFSMAT	
0046	REF	3	LAST	201	32,3043	37635 0	STCALL	LAND	
0047	REF	1			32,3044	71243 0		GUIDINIT	GUIDINIT INITIALIZES WM AND /LAND/
0048					32,3045	45345 1	CLOAD	DSL	
0049	REF	4	LAST	775	32,3046	02401 0		TLANC	
0050	REF	1			32,3047	25261 0		GUIDDUPN	
0051	REF	43	LAST	759	32,3051	34041 0	STCALL	TRFC1	INTEGRATE STATE FORWARD TO THAT TIME
0052	REF	9	LAST	759	32,3051	27460 1		LEMPREC	
0053					32,3052	77331 0	SSP	VLCAD	
00531	REF	1			32,3053	03647 1		NICNLCOP	
00532					32,3054	00050 1		40D	
0057	REF	7	LAST	762	32,3055	06522 1		UNITX	
0058	REF	2	LAST	123	32,3056	26575 1	STCVL	CG	
0059	REF	4	LAST	584	32,3057	06522 0		UNITY	
0060	REF	3	LAST	775	32,3060	26613 0	STCVL	CG +6	
0061	REF	7	LAST	705	32,3061	06516 0		UNITZ	
0062	REF	4	LAST	775	32,3062	16611 0	STCDL	CG +14	
00621	REF	1			32,3063	25257 0		99999CON	
00622	REF	4	LAST	216	32,3064	27665 1	STCVL	DEITAF	INITIALIZE DEITAF FOR VI6N68 DISPLAY
00623	REF	12	LAST	759	32,3065	06524 1		ZERIVECS	
00624	REF	4	LAST	764	32,3066	17254 1	STCDL	UNFC/2	INITIALIZE TRM VELOCITY CORRECTION TERM
0063	REF	7	LAST	765	32,3067	06524 1		HIAZPROS	
0065	REF	3	LAST	201	32,3070	03643 0	STORE	TTF/P	
0066					32,3071	77745 1	IGNALCOP	CLOAD	
0067	REF	15	LAST	726	32,3072	00015 0		TAT	
0068	REF	4	LAST	726	32,3073	27561 1	STCVL	PIPTIME1	
0073	REF	10	LAST	726	32,3074	00017 1		PATT1	
0074					32,3075	64312 0	VSL4	MXV	
0075	REF	28	LAST	775	32,3076	01734 0		REFSMAT	
0076	REF	5	LAST	601	32,3077	27521 0	STCALL	R	
0077	REF	2	LAST	726	32,3078	67067 1		MUNGRAV	
0078	REF	4	LAST	678	32,3079	25236 0	STCALL	GDT/2	
0079	REF	1			32,3082	62402 0		2GUIDSUB	WHICH DELIVERS N PASSES OF GUIDANCE

R0080 POLYNOMIAL IS PROGRAMMED AS FOLLOWS:-

R0081
 R0082 $(PIGN7 - ECU) / 16 + 16(RCU) KIGNY/PE + (RCL - FICNX) KIGNX/B4 + (ARVAL(VGL) - VIGN) KIGNV/E4$
 R0083
 R0084
 R0085
 R0086
 R0087
 R0088
 R0089

L THE LUNAR LANDING

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RCCFC

2

R0091 THE NUMERATOR IS SCALED IN METERS AT 2(28). THE DENOMINATOR IS A VELOCITY IN UNITS OF 2(1)M/CS.
 R0093 THE COEFFICIENT IS THUS A TIME IN UNITS OF 2(18) CENTISECONDS. THE FINAL SHIFT RESCALES TO UNITS OF 2(28) CS.
 R0095 THERE IS NO DAMPING FACTOR. THE CONSTANTS KIGNX/P4, KIGNY/P4 AND KIGNV/P4 ARE ALL NEGATIVE IN SIGN.

0097	REF	2	LAST	779	32,3112	551446	DELMCALC TS	NIGNLCCF	
00971	REF	116	LAST	778	32,3114	6042 1	TC	INTERPT	
00972					32,3115	57345 1	CLCAD	DMPR	FORM DENOMINATOR FIRST
0098	REF	3	LAST	201	32,3116	12627 1		VGL	
0099	REF	2	LAST	122	32,3117	02511 1		KIGNX/B4	
0100					32,3118	44232 1	SL4R	BDSU	
0101	REF	4	LAST	780	32,3111	12633 1		VGL +4	
0102					32,3112	45325 1	FCPL	DSU	
0103	REF	2	LAST	122	32,3113	12477 1		RIGNZ	
0104	REF	3	LAST	201	32,3114	12633 0		RGL +4	
0105					32,3115	65222 0	SF4R	PEEL	
0106	REF	4	LAST	780	32,3116	12631 1		RGL +2	
0107					32,3117	57316 1	ESQ	DMPR	
0108	REF	2	LAST	122	32,3118	12503 0		KIGNY/P4	
0109					32,3119	65232 1	SL4R	PDOL	
0110	REF	5	LAST	780	32,3122	12627 0		RCU	
0111					32,3123	57225 0	DSL	DMPR	
0112	REF	2	LAST	122	32,3124	12475 0		RIGNX	
0113	REF	3	LAST	780	32,3125	02511 1		KIGNX/B4	
0114					32,3126	51515 1	PDVL	ABVAL	
0115	REF	5	LAST	780	32,3127	12627 1		VGL	
0116					32,3130	57225 0	DSL	DMPR	
0117	REF	2	LAST	122	32,3131	12473 0		VIGN	
0118	REF	2	LAST	122	32,3132	02505 0		KIGNV/P4	
0119					32,3133	42215 0	CAC	DDV	
0120					32,3134	56215 1	CAC	DDV	
0121					32,3135	77661 0	SRR		
0122					32,3136	21612 0		100	
0123					32,3137	43206 1	PUSH	DAL	
0124	REF	5	LAST	779	32,3140	12561 0		PIPTIME1	
0125	REF	44	LAST	779	32,3141	14041 1	STOCL	TOFC1	STORE NEW GUESS FOR NEXT INTEGRATION
0126					32,3142	45246 0	ABS	DSU	
0127	REF	1			32,3143	25263 1		DELMCFIT	
0128					32,3144	45342 1	BMN	CALL	
0129	REF	1			32,3145	65164 1		DDUMGCOD	
0130	REF	26	LAST	710	32,3146	27412 0		INTSTALL	
0131					32,3147	43114 0	SET	SFT	
0132	REF	14	LAST	710	32,3150	01473 0		INTYFELG	
0133	REF	13	LAST	711	32,3151	00062 1		MCCNFLAG	
0134					32,3152	77745 1	CLCAD		
0136	REF	6	LAST	780	32,3153	03561 0		PIPTIME1	
0137	REF	12	LAST	710	32,3154	25517 0	STOVL	TET	HOPEFULLY 2GUIDSUB DID NOT
0138	REF	11	LAST	779	32,3155	00017 1		RATT1	CLCEER RATT1 AND VATT1

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0139 REF 12 LAST 710 32,2156 25535 0
 0140 REF 13 LAST 726 32,2157 25525 0
 0141 REF 17 LAST 711 32,216 25542 0
 0142 REF 7 LAST 710 32,2161 27111 1
 0143 32,2162 77650 1
 0144 REF 1 32,2163 65071 1

STOVL RCV
 VATT1
 STCALL VCV
 INTERPVS
 GCTC
 IGNALCCP

0145 32,2164 54325 0
 0146 REF 4 LAST 731 32,2165 03423 1
 0147 32,2166 20617 0
 0148 32,2167 77621 1
 0149 REF 45 LAST 760 32,217 00041 1

DCUMECCE SLCAE SR
 ZCCMTIME
 140
 RCLL
 TDECI

0150 REF 32 LAST 764 32,2171 27442 0
 0151 REF 3 LAST 601 32,2172 03527 1
 0152 32,2173 53435 0

STCVL TIG
 V
 VVX UNIT

COMPUTE DISTANCE LANDING SITE WILL BE
 OUT OF LV'S ORBITAL PLANE AT IGNITION:
 SIGN IS + IF LANDING SITE IS TO THE
 RIGHT, NORTH; - IF TO THE LEFT, SOUTH.

0153 REF 6 LAST 775 32,2174 03521 1
 0154 32,2175 72441 0
 0155 REF 4 LAST 775 32,2176 03635 1

R
 SCT
 SL1
 LAND

0156 REF 3 LAST 316 32,2177 26617 0
 0157 REF 5 LAST 775 32,2178 03254 1
 0158 REF 4 LAST 122 32,2179 26621 0

R60INIT STCVL CUTOFFLN
 UNFC/2
 STORE R60VSAFE

INITIALIZATION FOR CALCMANL
 STORE UNFC/2 TEMPORARILY IN R60VSAFE

0162 32,218 77776 1
 0163

EXIT

0164 REF 52 LAST 778 32,218 0 5353 1
 0165 32,218 04024 0

IGNALCPT TC
 CCT

PHASCHNG
 04024

PREVENT REPEATING IGNALG

0166 REF 1 32,218 4 4362 0
 0167 REF 213 LAST 778 32,218 0 4616 1
 0168 REF 2 LAST 726 32,218 74670 0
 0169 REF 126 LAST 765 32,218 1 5155 1

ASTNCLOCK CS
 TC
 CADR
 TCF

ASTNDCX
 BANKCALL
 STICK2
 PNOCFJCB

RETURN IN NEW JOB AND IN FRANK FIVE

0170 REF 117 LAST 78 32,221 0 6042 1
 0171 32,221 47131 1
 0172 REF 2 LAST 125 32,221 02747 1
 0173 REF 1 32,221 65216 1

ASTNRET TC
 SSP
 FCAOR

INTPRET
 RTE
 QMAJ

GO PICK UP DISPLAY AT END OF R51:
 "PROCEED" WILL DO A FINE ALIGNMENT
 "ENTER" WILL RETURN TO P63SPQT2

0174 REF 1 32,221 31127 1
 0175 32,221 53575 0
 01751 REF 5 LAST 781 32,221 02621 0

P63SPQT2 VLEAF
 UNIT

R51P63
 R60VSAFE

INITIALIZE KALCMANU FOR BURN ATTITUDE

01752 REF 6 LAST 762 32,222 27773 1
 01753 REF 8 LAST 775 32,222 06522 1
 01754 REF 23 LAST 762 32,222 03765 0

STCVL PCINTVSM
 UNITX
 STOPE SCAXIS

01755 32,223 77775 1

EXIT

01756 REF 6 LAST 755 32,224 3 5016 0
 01757 REF 24 LAST 755 32,225 54 013 1

CAF
 TS

FRANK7
 FBANK

0176 32,226 0 0014 0
 0177 REF 38 LAST 755 32,227 0 4674 1
 0178 REF 2 LAST 747 32,228 40143 0

ININT
 TC
 CADR

BANKCALL
 DELITEDB

L THE LUNAR LANDING

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0179				32,3231	0 0003 1	REFLINT		
0180	REF	214	LAST	781	32,3232	0 4615 1	TC	PANKCALL
0181	REF	5	LAST	747	32,3233	54123 0	CADR	R6PLEM
0182	REF	52	LAST	781	32,3234	0 5353 1	TC	PF4SCFNG PREVENT RECALLING R60
0183					32,3235	04024 0	CCT	04024
0184	REF	41	LAST	681	32,3236	3 4746 0	P63SPCT3 CA	BIT6 IS THE LF ANTENNA IN POSITION 1 YET
0185					32,3237	0 0006 1	EXTEND	
0186	REF	22	LAST	607	32,3240	02 032 0	PAND	CHAN33
0187					32,3241	0 0006 1	EXTEND	
0188	REF	1			32,3242	1 325 1	BZF	P63SPCT4 BRANCH IF ANTENNA ALREADY IN POSITION 1
0189	REF	1			32,3243	3 3255 0	CAF	CODE500 ASTRONAUT: PLEASE CRANK THE
0190	REF	215	LAST	782	32,3244	0 4616 1	TC	SILLY THING APCOND
0191	REF	4	LAST	741	32,3245	20624 0	CADR	CCPFRF1
0192	REF	26	LAST	752	32,3246	1 6001 1	TCF	GCTCFCHH TERMINATE
0193	REF	1			32,3247	1 3236 1	TCF	P63SPCT3 PROCEED SEE IF HE'S LYING
0194	REF	216	LAST	782	32,3250	0 4616 1	P63SPCT4 TC	PANKCALL ENTER INITIALIZE LANDING RADAR
0195	REF	1			32,3251	67703 1	CADR	SETPOST
0196	REF	45	LAST	754	32,3252	0 4635 0	TC	POSTJUMP OFF TO SEE THE WIZARD...
0197	REF	2	LAST	747	32,3253	74130 0	CADR	RLRNABY

RC198

PD199

CONSTANTS FOR P63LM AND IGNALE

0200	REF	2	LAST	741	32,3254	02100 1	P63ADRES	CENADR P63TABLE
0202	REF	2	LAST	460	4362		ASTADFX =	MD1 OCT 25: INDEX FOR CLOKTASK
0203					32,3255	01500 1	CCDF500	CCT 00500
02035					32,3256	00035 1	99999CCN	2DEC 30479.7 B-24
02036					32,3257	30373 0		
0204					32,3260	00004 0	GLIDCURN	2DEC + 66440 GLIDPLRN +6.64400314E+ 2
0204					32,3261	01610 1		
0205					32,3262	00000 1	DELUMBIT	2DEC +8 B-28 CRITERION FOR IGNALE CONVERGENCE
0205					32,3263	00010 0		

GAF: ASSEMBLE REVISION 116 OF /CC PROGRAM LUMINARY BY NASA ZC21112-C71

19:09 AUG. 11, 1969 FLY

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L THE LUNAR LANDING

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P0207
P0208
P0209*****
P08: LANDING CONFIRMATION

0211				34,3271		BANK	34		
0211	REF	1		34,3271		SETLOC	F2DFS#34		
0212				34,3271		BANK			
0213	REF	1				CCOUNT#	11/P6567		
0214	REF	54	LAST	782	34,3271	0 5253	1	LANDJLNK	TC PHASCHNG
0215					34,3272	04024	0	CCT	04024
02151					34,3273	0 0034	0	ININT	
0216	REF	217	LAST	782	34,3274	4616	1	TC	BANKCALL ZFRC ATTITUDE ERROR
0217	REF	6	LAST	749	34,3275	40154	1	CADR	ZATFEROR
0221	REF	118	LAST	781	34,3276	0 6542	1	TC	INTPPT TC INTERPRETIVE AS TIME IS NOT CRITICAL
02211					34,3277	77614	1	SET	PREVENT RCS JET FIRINGS IF MODE CCNT IS
02212	REF	4	LAST	733	34,3278	06460	0		IN ATT HOLD
0222					34,3301	43014	0	SET	PLUSEFLG CLEAR
0223	REF	14	LAST	656	34,3302	04767	1		SUFFFLAG
0224	REF	1			34,3303	04666	0		LFTABORT
0225					34,3304	77214	0	SET	VLCAD
0226	REF	2	LAST	767	34,3305	05062	0		APSEFLAG
0230	REF	11	LAST	773	34,3306	01220	0		RA
0231	REF	3	LAST	657	34,3307	16022	1	STODL	ALPHAV
0232	REF	11	LAST	773	34,3310	01234	0		PIPTIME
0233					34,3311	45014	0	SET	CALL
0234	REF	3	LAST	657	34,3312	01463	1		LUNAFLEG
0235	REF	2	LAST	657	34,3313	26351	1		LAT-LONG
0236					34,3314	77271	1	SETPD	VLCAD
0237					34,3315	00011	0		COMPUTE RLS AND STORE IT AWAY
0238	REF	12	LAST	784	34,3316	01220	0		RA
0239					34,3317	65352	0	VSL2	PDDL
0240	REF	12	LAST	784	34,3320	01234	0		PIPTIME
0241					34,3321	45006	0	PUSH	CALL
0242	REF	1			34,3322	51577	0		S-T0-RP
0243	REF	7	LAST	779	34,3323	02022	1	STORE	RLS
0244					34,3324	77776	1	EXIT	
0245	REF	1			34,3325	3 3342	1	CAF	V06N42*
0246	REF	218	LAST	784	34,3326	4 4616	1	TC	BANKCALL ASTRONAUT: NOW LOOK WHERE YCL ENDED UP
0247	REF	21	LAST	746	34,3327	27477	1	CADR	G0FLASH
0248	REF	27	LAST	782	34,3328	1 6001	1	TCF	G0TOPROH TERMINATE
0249					34,3331	1 3323	0	TCF	+2 PRECEC
0250					34,3332	1 3325	1	TCF	-5 RECYCLE
0251	REF	119	LAST	784	34,3333	0 6042	1	TC	INTPPT
0252					34,3334	77775	1	VLCAD	INITIALIZE GSAV AND (USING RFFMF)

L THE LUNAR LANDING

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0252 PFF 9 LAST 781 24,2235 06522 1

UNITX

YNFSAV, ZNESAV AND ATTFLAG FOR P57

0254 PFF 5 LAST 203 34,3336 36231 1

STCALL GSAV

0255 PFF 1 34,3337 33471 0

REFME

0256 34,2240 77776 1

EXIT

0257 PFF 28 LAST 784 34,3341 1 6001 1

TCE

GCTOPPOH

ASTRONAUT: PLEASE SELECT P57

0258 24,2242 01453 1 VC6N43* VN 7643

L THROTTLE CONTROL POLYTINS

USER'S PAGE NO. 1 EC 53

0001 21,2144 BANK 31
 0002 RFF 2 LAST 40 31,2144 SETLFC THRCT
 0003 21,2144 BANK
 0004 RFF 2 LAST 150 27,1612 FRANK= PIF
 0005 RFF 2 LAST 40 TC 40 5 5* COUNT* 15/THROT
 R0006 * * * * *

R0008 HERE FC, DESIRED THRUST, AND FP, PRESENT THRUST, UNWEIGHTED, ARE COMPUTED.

0010 RFF 3 LAST 212 31,2144 3 1245 0 THROTTLE CA ABCELV COMPUTE PRESENT ACCELERATION IN UNITS OF
 0011 21,2146 0 0076 1 EXTEND 2(-4) M/CS/CS, SAVING SERVICER TROUBLE
 0012 RFF 1 31,2146 7 2345 0 MP /AF/CONST
 0013 31,2147 0 0006 1 +3 EXTEND
 0014 RFF 2 LAST 150 31,2150 231607 1 QXCF RTNHELD
 0015 RFF 1 31,2151 0 2326 1 AECUMP TC MASSMULT
 0016 RFF 1 31,2152 521470 1 EXCF FP FP = PRESENT THRUST
 0017 31,2153 0 0006 1 EXTEND
 0018 RFF 2 LAST 141 31,2154 3 1464 0 DCA /AF/CONST
 0019 RFF 2 LAST 786 31,2155 0 2326 1 TC MASSMULT
 0020 RFF 3 LAST 211 31,2156 551615 0 TS FC FC = THRUST DESIRED BY CLICANCE
 0021 RFF 2 LAST 141 31,2157 521466 0 EXCF FCCDD FCCDD = WHAT IT IS GOING TO GET

R0022 IF IT HAS BEEN LESS THAN 2 SECONDS SINCE THE LAST THROTTLING, ALIGNMENT FP USING THE FWEIGHT CALCULATED THEN.

0024 RFF 2 LAST 150 31,2160 4 1617 1 CS TTHROT THIS CODING ASSUMES A FLATCUT WITHIN
 0025 RFF 8 LAST 736 31,2161 6 0025 0 AD TIME1 80 SECONDS BEFORE FIRST THROTTLE CALL
 0026 RFF 14 LAST 559 31,2162 7 4733 0 MASK POSMAX
 0027 31,2163 4 0000 0 CCM
 0028 RFF 1 31,2164 6 5002 0 AD 3 SECS
 0029 31,2165 0 0006 1 EXTEND
 0030 RFF 1 31,2166 6 2172 1 BZMF WHEREFC BRANCH IF (TIME1-TTHROT +1) > 3 SECONDS
 0031 31,2167 0 0006 1 EXTEND
 0032 RFF 2 LAST 150 31,2170 3 1611 0 DCA FWEIGHT
 0033 RFF 2 LAST 786 31,2171 211470 1 DAS FP

R0034 THIS LOGIC DETERMINES THE THROTTLING IN THE REGION 10% - 94%. THE MANUAL THROTTLE, NOMINALLY SET AT
 R0036 MINIMUM BY ASTRONAUT OR MISSION CONTROL PROGRAMS, PROVIDES THE LOWER BOUND. A STOP IN THE THROTTLE HARDWARE
 R0038 PROVIDES THE UPPER.

0039 RFF 5 LAST 774 31,2172 3 5014 1 WHEREFC CA FBANK5 INITIALIZE L*WCR*1 AND H*GHCRT FROM
 0040 RFF 25 LAST 781 31,2173 54 003 0 TS FBANK FAD LOADED FRASAPLES IN W-MATRIX

1 THROTTLE CONTROL ROUTINES

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0041	REF	2	LAST	122	35,15 6		EPANK=	LOWCRIT	
0042					31,2174	0 0 6 1	EXTEND		
0043	REF	3	LAST	787	31,2175	3 15 7 1	CCA	LOWCRIT	
0044	REF	1			31,2176	52 131 0	EXCH	L*WCR*T	
0045	REF	7	LAST	781	31,2177	3 5 16 0	CA	FRANK7	
0046	REF	26	LAST	786	31,2200	54 0 13 0	TS	FBANK	
0047	REF	3	LAST	780	31,2201	4 4 755 0	EBANK=	PIF	
0048	REF	142	LAST	778	31,2202	55 6 6 1	CS	ZERO	INITIALIZE PIFSET
0049	REF	2	LAST	150	31,2203	4 0 121 0	TS	PIFSET	
0050	REF	1			31,2204	6 162 1 1	CS	H*GHCR*T	
0051	REF	2	LAST	150	31,2205	0 0 116 1	AC	FCOLD	
0052					31,2206	6 222 0	EXTEND		
0053	REF	1			31,2207	4 0 13 1	BZMF	LOWFCOLD	BRANCH IF FCOLD < CR = HIGHCRIT
0054	REF	2	LAST	787	31,2210	6 1465 1	AD	FCOLD	
0055	REF	3	LAST	786	31,2211	0 0 106 1	AD	FCOLD	
0056					31,2212	6 2215 0	EXTEND		
0057	REF	1			31,2213	3 1467 0	BZMF	FCOMESET	BRANCH IF FC < CR = LOWCRIT
0058	REF	3	LAST	786	31,2214	1 2225 1	CA	FP	SEE ACTE 1
0059	REF	1			31,2215	4 2002 0	TCF	FLATOUT1	
0060	REF	1			31,2216	6 1467 0	FCOMESET	CS	FMAXCOP
0061	REF	4	LAST	787	31,2217	1 2227 0	AD	FP	SEE ACTE 2
0062	REF	1			31,2218	0 0 106 1	TCF	FLATOUT2	
0063	REF	2	LAST	787	31,2220	6 1465 1	LOWFCOLD	CS	H*GHCR*T
0064	REF	4	LAST	787	31,2221	0 0 106 1	AD	FCOLD	
0065					31,2222	6 2220 1	EXTEND		
0066	REF	1			31,2223	3 2003 0	BZMF	DCPIF	BRANCH IF FC < CR = HIGHCRIT
0067	REF	1			31,2224	52 1465 0	CA	FMAXPCS	NO: THROTTLE-UP
0068	REF	5	LAST	787	31,2225	3 4737 0	FLATOUT1	EXCH	FCOLD
0069	REF	1			31,2226	55 6 16 1	CA	FEETPA	
0070	REF	3	LAST	787	31,2227	0 0 106 1	FLATOUT2	TS	PIFSET

A0071 NOTE 1 FC IS SET EQUAL TO FP SO PIF WILL BE ZERO. THIS IS DESIRABLE
 A0072 AS THERE IS ACTUALLY NO THROTTLE CHANGE.

A0073 ACTE 2 HERE, SINCE WE ARE ABOUT TO RETURN TO THE THROTTLEABLE REGION
 A0074 (BELOW 552) THE QUANTITY -(FMAXCOP - FP) IS COMPUTED AND PLT
 A0075 INTO PIFSET TO COMPENSATE FOR THE DIFFERENCE BETWEEN THE
 A0076 NUMBER OF BITS CORRESPONDING TO FULL THROTTLE (FMAXCOP) AND THE
 A0077 NUMBER CORRESPONDING TO ACTUAL THRUST (FP). THUS THE TOTAL
 A0078 THROTTLE COMMAND PIF = FC - FP - (FMAXCOP - FP) = FC - FMAXCOP.

0081	REF	1			31,2230	0 0 106 1	DCPIF	TC	FASTCHNG
0082					31,2231	3 1465 1	EXTEND		
0083	REF	6	LAST	787	31,2232	55 6 20 0	CCA	FCOLD	
0084	REF	3	LAST	787	31,2233	0 0 106 1	TS	FCOLD	
0085	REF	4	LAST	787	31,2234	53 6 13 0	EXCH	PIF	
0086					31,2235	0 0 106 1	EXTEND		

L THROTTLE CONTROL ROUTINES

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0087	REF	5	LAST	787	31,2236	4 1470 1	FCS	FP	
0088	REF	5	LAST	787	31,2237	21'613 0	CAS	PIF	PIF = FC - FP, NEVER EQUALS +1

0089	REF	6	LAST	788	31,2240	3 1612 0	COIT	CA	PIF	
0090	REF	4	LAST	787	31,2241	6 1616 0		AD	PIFSET	ADD IN PIFSET, WITHOUT CHANGING PIF
0091	REF	3	LAST	201	31,2242	55'614 1		TS	PSLDC55	✓
0092	REF	4	LAST	753	31,2243	54 055 1		TS	THUS1	
0093	REF	22	LAST	753	31,2244	3 475 1		CAF	BIT4	
0094					31,2245	0 0016 1		EXTEND		
0095	REF	10	LAST	753	31,2246	05 114 1		WCR	CHAN14	
0096	REF	9	LAST	786	31,2247	3 0025 0		CA	TIM1	
0097	REF	3	LAST	786	31,225	55'617 1		TS	TTHRET	

R0098 SINCE /ΔF/ IS NOT AN INSTANTANEOUS ACCELERATION, BUT RATHER AN "AVERAGE" OF THE ACCELERATION LEVELS DURING THE PRECEDING PIPA INTERVAL, AND SINCE FP IS COMPUTED DIRECTLY FROM /ΔF/, FP IN ORDER TO CORRESPOND TO THE ACTUAL THRUST LEVEL AT THE END OF THE INTERVAL MUST BE WEIGHTED BY

$$R0103 \quad \text{FWEIGHT} = \frac{\text{PIF}(\text{PERPROCESS} + \text{TL})}{\text{PGUID}} + \frac{\text{PIF} / \text{PIF}}{2 \text{ PGUID RATE}}$$

R0106 WHERE PERPROCESS IS THE TIME BETWEEN PIPA READING AND THE START OF THROTTLING, PGUID IS THE GUIDANCE PERIOD, AND R0108 RATE IS THE THROTTLING RATE (32 UNITS PER CENTISECOND). PGUID IS EITHER 1 OR 2 SECONDS. THE "TL" IN THE R0110 FIRST TERM REPRESENTS THE ENGINE'S RESPONSE LAG. HERE FWEIGHT IS COMPUTED FOR USE NEXT PASS.

0112	REF	2	LAST	152	31,2251	3 1762 0	CA	THISPIF +1	INITIALIZE FWEIGHT COMP AS IF FOR P66
0113	REF	49	LAST	459	31,2252	54 130 1	TS	BUF	

0114	REF	11	LAST	683	31,2253	4 1010 0	CS	MCPREG	ARE WE IN FACT IN P66?
0115	REF	1			31,2254	5 2433 1	AD	DEC66	
0116					31,2255	0 0016 1	EXTEND		
0117	REF	1			31,2256	1 2263 0	BZF	FWCOMP	YES

0118	REF	13	LAST	784	31,2257	3 1234 0	CA	PIPTIME +1	NO: INITIALIZE FOR TWO SECOND PERIOD
0119	REF	50	LAST	788	31,2260	54 130 1	TS	BLF	
0120	REF	2	LAST	164	31,2261	3 5003 1	CAF	4SECS	
0121	REF	2	LAST	788	31,2262	1 2264 1	TCF	FWCOMP +1	

0122	REF	3	LAST	608	31,2263	3 5000 1	FWCOMP	CAF	2SECS	
0126	REF	199	LAST	756	31,2264	54 102 1	+1	TS	0	
01261					31,2265	0 0016 1		EXTEND		
01262	REF	42	LAST	782	31,2266	7 4746 1	MF	BIT6		
01263	REF	51	LAST	788	31,2267	22 131 1	LXCF	BLF +1		
0127	REF	52	LAST	798	31,227	4 0131 1	CS	BUF	TIME OF LAST PIPA READING.	
0128	REF	10	LAST	788	31,2271	6 1025 1	AD	TIM1		
0129	REF	1			31,2272	6 2104 1	AD	THROTLAG	COMPENSATE FOR ENGINE RESPONSE LAG	
0130	REF	4	LAST	462	31,2273	7 4357 0	MASK	LEWB	MAKE SUFF SMALL AND POSITIVE	
0131					31,2274	22 007 1	ZL			
0132					31,2275	0 0016 1	EXTEND			

L THE TITLE CONTACT ROUTINES

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0133	REF 200	LAST	788	31,2276	10 002 1	RV	Q
0134				31,2277	0 006 1	EXTEND	
0135	REF 7	LAST	788	31,2278	7 1612 1	MP	PIF
0136				31,2301	6 0000 1	DOUBLE	
0137	REF 3	LAST	788	31,2302	53 611 1	GXCF	FW IGT
0138	REF 8	LAST	789	31,2302	11 612 1	CCS	PIF
0139	REF 85	LAST	778	31,2304	6 4753 1	AD	ONE
014				31,2305	1 2307 0	TCF	+2
0141	REF 86	LAST	789	31,2306	6 4753 1	AD	ON
0142				31,2307	0 0006 1	EXTEND	
0143	REF 9	LAST	789	31,2310	7 1612 1	MP	PIF
0144				31,2311	0 0006 1	EXTEND	
0145	REF 53	LAST	788	31,2312	10 121 0	RV	PLF +1
0146				31,2312	22 007 0	ZL	
0147	REF 4	LAST	789	31,2314	21 611 1	CAS	FW IGT

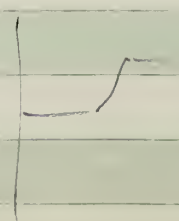
0148	REF 3	LAST	786	31,2315	0 1607 1	THUMP	TC	RTNHOLD
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R0148 FLATOUT THROTTLES UP THE DESCENT ENGINE, AND IS CALLED AS A BASIC SUBROUTINE.

0151	REF 29	LAST	732	31,2316	3 4737 0	FLATOUT	CAP	BIT13	4096 PULSES
0152	REF 5	LAST	789	31,2317	55 6 6 1	WHATOLT	TS	PIFSET	USE PIFSET SO FWEIGHT WILL BE ZERO
0153	REF 143	LAST	787	31,2320	4 4755 0	CS	ZERO		
0154	REF 4	LAST	787	31,2321	55 620 1	TS	FCOLD		
0155	REF 11	LAST	789	31,2322	55 612 1	TS	PIF		
0156				31,2323	0 0006 1	EXTEND			
0157	REF 4	LAST	789	31,2324	22 6 7 1	GXCF	RTNHOLD		
0158	REF 1			31,2325	1 2243 1	TCF	DOIT		

R0158 MASSMLT SCALES ACCELERATION, ARRIVING IN A AND L IN UNITS OF 2(-4) M/CS/CS, TO FORCE IN PULSE UNITS.

0161				31,2326	0 0006 1	MASSMLT	EXTEND		
0162	REF 54	LAST	789	31,2327	22 130 0	GXCF	RUF		
0163	REF 321	LAST	767	31,2328	52 155 1	GXCF	MFAC		
0164	REF 16	LAST	437	31,2331	71 6 1	TC	DMP		
0165	REF 5	LAST	296	31,2332	0 1243 0	ADRES	MASS		
0166	REF 17	LAST	789	31,2332	0 7106 1	TC	DMP		LEAVES PROPERLY SCALED FORCE IN MPAC
0167	REF 1			31,2334	0 2005 0	ADRES	SCALEFAC		
0168	REF 10	LAST	767	31,2335	0 7262 0	TC	TEAGREE		
0169	REF 302	LAST	799	31,2336	2 0154 1	CA	MPAC		
0170				31,2337	0 0006 1	EXTEND			
0171				31,2340	1 2243 0	BZF	+3		
0172	REF 15	LAST	786	31,2341	3 4737 1	CAP	PCSMAX		
0173	REF 55	LAST	789	31,2342	0 0130 0	TC	RUF		
0174	REF 303	LAST	789	31,2343	52 156 1	GXCF	MFAC +1		
0175	REF 56	LAST	789	31,2344	0 0130 0	TC	RUF		



GAP: ASS 56LE REVISION 116 OF ALL PROGRAM LUMINARY BY NAS: 2021112-71

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L THROTTLE CONTROL ROUTINES

USER'S PAGE NO. 5 E7 52

R0176 CONSTANTS:-

0177 PFF 3C LAST 789 4737 FEXTRA = BIT13 FEXT +E.133C9C2CF+ 4

0180 21,234E C4143 0 /AF/CONST DEC .13107

R7181 * * * * *

L LUMARY LANDING GUIDANCE EQUATIONS

USER'S PAGE NO. 1

EO S3

P0001

0002 RFF 2 LAST 778 57,1621

EBANK= E2DPS

0003 RFF 2 LAST 39 TC 4: 2 2*

COUNT# 11/F2DPS

P0004 *****

R0016 LUMARY LANDING FLIGHT SOLUTION TABLES

R0017 *****

R0009 FLIGHT SEQUENCE TABLES ARE ARRANGED BY FUNCTION. THEY ARE REFERENCED USING AS AN INDEX THE REGISTER WCHPHASE:

A0011	WCHPHASE = -1 --->	IGNALG
A0012	WCHPHASE = 0 --->	BRKQLAD
A0013	WCHPHASE = 1 --->	APPRQUAD
A0014	WCHPHASE = 2 --->	VERTICAL

R0015 *****

P0017 ROUTINES FOR STARTING NEW GUIDANCE PHASES:

0018	RFF 1	31,2346	1 2603 1	TCF	TTFIACP	IGNALG
0019	RFF 2 LAST 791	31,2347	1 2603 1	WCHPHASE	TTFIACP	BRKQLAD
0020	RFF 1	31,235	1 2566 1	TCF	STARTP64	APPRQUAD
0021	RFF 1	31,2351	1 2557 0	TCF	P65START	VERTICAL

R0022

R0023 PRE-CLIFFANCE COMPUTATIONS:

0024	RFF 1	31,2352	1 2763 0	TCF	CALCPCVC	IGNALG
0025	RFF 1	31,2353	1 2772 1	PREGLIDE	PGVGCALC	BRKQLAD
0026	RFF 1	31,2354	1 2664 0	TCF	RFEDESIG	APPRQUAD
0027	RFF 2 LAST 791	31,2355	1 2772 1	TCF	PGVGCALC	VERTICAL

R0028

R0029 GUIDANCE EQUATIONS:

0029	RFF 1	31,2356	1 3041 0	TCF	TTF/RCL	IGNALG
0031	RFF 2 LAST 791	31,2357	1 3041 0	WCHPHASE	TTF/RCL	BRKQLAD
0032	RFF 2 LAST 791	31,2360	1 3041 0	TCF	TTF/RCL	APPRQUAD
0033	RFF 1	31,2361	1 2514 0	TCF	VERTGLID	VERTICAL

R0034

R0035 POST CLIFFANCE EQUATION COMPUTATIONS:

0036	RFF 1	31,2362	1 3241 0	TCF	CGCALC	IGNALG
0037	RFF 1	31,2363	1 3225 0	AFTRCUID	EXTLCCIC	BRKQLAD
0038	RFF 2 LAST 791	31,2364	1 3225 0	TCF	EXTLCCIC	APPRQUAD
0039	RFF 1	31,2365	1 3411 1	TCF	STIFF2	VERTICAL

R0040

L LUNAR LANDING GUIDANCE EQUATIONS

LSFR'S PAGE NO. 2 E7 S2

R0041 WINDOW VECTOR COMPUTATIONS:

0042	REF	1	31,2266	1 3310 1	TCF	EXCSUP	IGNALC
0043	REF	1	31,2367	1 3331 1	WHATFXIT	EXBRAX	BRAXQUAD
0044	REF	1	31,2370	1 3337 1	TCF	EXACRM	APPRQUAD

R0045

R0046 DISPLAY ROUTINES:

0047	REF	1	31,2371	1 3451 1	WHATDISF	PERDISPS	BRAXQUAD
0048	REF	1	31,2372	1 3453 1	TCF	P64DISPS	APPRQUAD
0049	REF	1	31,2373	1 3502 1	TCF	VERTDISP	VERTICAL

R0050

R0051 ALARM ROUTINE FOR TTF COMPUTATION:

0052	REF	1	31,2374	1 3712 1	TCF	1406FCO	IGNALC
0053	REF	1	31,2375	1 3714 1	WHATALM	1406ALM	BRAXQUAD
0054	REF	2	LAST 792	31,2376	1 3714 1	TCF	1406ALM

R0055

R0056 INDICES FOR REFERENCING TARGET PARAMETERS:

0057			31,2377	00000 1	OCT	0	IGNALC
0058			31,2400	00000 1	TARGETFX	0	BRAXQUAD
0059			31,2411	00034 0	CCT	34	APPRQUAD

R0060

R0061 *****
 R0063 ENTRY POINTS: ?GUIDSUP FOR THE IGNITION ALGORITHM, LUNLAND FOR SEPVOUT

R0064 *****

R0066 IGNITION ALGORITHM ENTRY: DELIVERS N PASSES OF QUADRATIC GUIDANCE

0067			31,2412	77776 1	?GUIDSUP	FXIT	
0068	REF	46	LAST 745	31,2413	3 4752 0	CAF	TWO
0069	REF	1		31,2414	55'647 1	TS	NGUIDSUB
0070	REF	1		31,2415	1 2541 1	TCF	GUILDRET +2
0071	REF	2	LAST 792	31,2416	55'647 1	GLIDSLB	TS
0072	REF	2	LAST 791	31,2417	1 2763 0	TCF	CALCPGVG

R0073 NORMAL ENTRY: CONTROL COMES HERE FROM SEPVOUT

0074	REF	55	LAST 754	31,2418	0 5252 1	LUNLAND	TC
0075				31,2411	00035 1	OCT	00035
0076	REF	24	LAST 753	31,2412	3 0101 1	CA	FLAGWRCS
0077	REF	1		31,2413	7 4744 0	MASK	ZCCMBIT
0078				31,2414	0 0000 1	EXTEND	
0079	REF	1		31,2415	1 3442 1	BZF	DISPXIT +3

AC: CC DISPLAYS ONLY

L LUNAR LANDING GUIDANCE EQUATIONS

LSEPI'S PAGE NO. 3 E7 S3

0080	REF .56	LAST	702	31,2416	0 5353	1	TC	PHASCFNC	YES: CD GUIDANCE
0081				31,2417	05223	0	CC1	0523	
0082				31,2420	23000	0	OCT	20000	

ROCF3 *****

ROCF5 GUIDENSTERN: AUTO-MODES MONITOR (R13)

ROCF6 *****

0088 REF 1 CCUNT* \$\$\$/P13

ROCF8 HERE IS THE PHILOSOPHY OF GUIDENSTERN: ON EVERY APPEARANCE OR DISAPPEARANCE OF THE MANUAL THROTTLE
 ROCF9 DISCRETE TO SELECT P67 OR P66 RESPECTIVELY; ON EVERY APPEARANCE OF THE ATTITUDE-HOLD DISCRETE TO SELECT P66
 ROCF3 UNLESS THE CURRENT PROGRAM IS P67 IN WHICH CASE THERE IS NO CHANGE.

0094 31,2421 0 0006 1 GUIDEN EXTEND IS UN-AUTO-THROTTLE DISCRETE PRESENT?

0095	REF 5	LAST	74	31,2422	00030	1	STERN	READ	CHAN31
0096	REF 36	LAST	744	31,2423	7 4747	0		MASK	R1TF
0097	REF 232	LAST	756	31,2424	10 000	0		CCS.	A

0098	REF 1			31,2425	1 2503	1	TCF	STARTP67	YES
0099	REF 4	LAST	733	31,2426	2 5321	1	TC	CHCKMM	NO: ARE WE IN P67 NOW?

0100				31,2427	00103	0	DEC	67	
------	--	--	--	---------	-------	---	-----	----	--

0101	REF 1			31,2430	1 2511	1	TCF	STABL?	NO
------	-------	--	--	---------	--------	---	-----	--------	----

0102	REF 2	LAST	787	31,2431	0 3717	0	STARTP66	TC	FASTCHNG
------	-------	------	-----	---------	--------	---	----------	----	----------

0103	REF 2	LAST	374	31,2432	0 5311	1	TC	NEWMODEX	YES
------	-------	------	-----	---------	--------	---	----	----------	-----

0104				31,2433	00102	1	DEC66	DEC	66
------	--	--	--	---------	-------	---	-------	-----	----

0105				31,2434	0 0006	1		EXTEND	
------	--	--	--	---------	--------	---	--	--------	--

0106	REF 6	LAST	316	31,2435	3 1474	1	CCA	HCTCISE	SET DESIRED ALTITUDE RATE = CURRENT ALTITUDE RATE.
------	-------	------	-----	---------	--------	---	-----	---------	--

0107	REF 1			31,2436	530645	1	CXCF	VDGVEPT	
------	-------	--	--	---------	--------	---	------	---------	--

0108	REF 120	LAST	784	31,2437	0 6042	1	STARTP66	TC	INTPRET
------	---------	------	-----	---------	--------	---	----------	----	---------

0109				31,2440	41535	1		SLCAD	PUSH
------	--	--	--	---------	-------	---	--	-------	------

0110	REF 1			31,2441	01457	0			PRIASZ
------	-------	--	--	---------	-------	---	--	--	--------

0111				31,2442	41535	1		SLCAD	PUSH
------	--	--	--	---------	-------	---	--	-------	------

0112	REF 1			31,2443	01455	1			PRIASZ
------	-------	--	--	---------	-------	---	--	--	--------

0113				31,2444	55535	1		SLCAD	VDFF
------	--	--	--	---------	-------	---	--	-------	------

0114	REF 2	LAST	110	31,2445	01453	1			PRIASX
------	-------	------	-----	---------	-------	---	--	--	--------

0115				31,2446	43161	1	VXSC	SET	
------	--	--	--	---------	-------	---	------	-----	--

0116	REF 1			31,2447	25546	1			PRIASACT
------	-------	--	--	---------	-------	---	--	--	----------

0117	REF 1			31,2450	00463	0			PCDFLAG
------	-------	--	--	---------	-------	---	--	--	---------

0118	REF 1			31,2451	26621	0	STOVL	VPIAS	
------	-------	--	--	---------	-------	---	-------	-------	--

0119	REF 2	LAST	105	31,2452	01254	0			TENX
------	-------	------	-----	---------	-------	---	--	--	------

0120				31,2453	77676	0	VCOMP		
------	--	--	--	---------	-------	---	-------	--	--

0121	REF 2	LAST	152	31,2454	27764	1	STOVL	QLOPIPAX	
------	-------	------	-----	---------	-------	---	-------	----------	--

0122	REF 13	LAST	775	31,2455	06524	1			7ERCVFCS
------	--------	------	-----	---------	-------	---	--	--	----------

0123	REF 2	LAST	152	31,2456	17767	1	STOVL	DELVECD	
------	-------	------	-----	---------	-------	---	-------	---------	--

0124	REF 2	LAST	123	31,2457	02540	1			RCDSCALE
------	-------	------	-----	---------	-------	---	--	--	----------

0125	REF 2	LAST	152	31,2460	17757	1	STOVL	RCDSCALL	
------	-------	------	-----	---------	-------	---	-------	----------	--

0126	REF 14	LAST	788	31,2461	01234	0			P1PTIME
------	--------	------	-----	---------	-------	---	--	--	---------

0127	REF 2	LAST	152	31,2462	03760	0	STOVL	LASTTPIP	
------	-------	------	-----	---------	-------	---	-------	----------	--

0128				31,2463	77776	1	EXIT		
------	--	--	--	---------	-------	---	------	--	--

0129	REF 144	LAST	789	31,2464	3 0755	1	CAF	ZERO	
------	---------	------	-----	---------	--------	---	-----	------	--

L LUNAR LANDING GUIDANCE EQUATIONS

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E7 S3

0130	REF	5	LAST	789	31,2465	55'621 0	TS	ECCLD	
0131	REF	5	LAST	789	31,2466	55'611 0	TS	FWFICHT	
0132	REF	6	LAST	794	31,2467	55'611 1	TS	FWFICHT +1	
0133	REF	1			31,2470	55'647 1	VRTSTART	WCHVERT	
0134	REF	47	LAST	792	31,2471	3 4752 0	CAF	TWC	WCHPHASE = 2 ---> VERTICAL: P65,P66,P67
0135	REF	3	LAST	791	31,2472	55'621 1	TS	WCHPHCLD	
0136	REF	3	LAST	778	31,2473	55'346 0	TS	WCHPHASE	
0137	REF	210	LAST	784	31,2474	0 4616 1	TC	PAKCALL	TEMPORARY, 1 HOPS HOPS HOPS
0138	REF	4	LAST	755	31,2475	40166 1	CADR	STOPRATE	TEMPORARY, 1 HOPS HOPS HOPS
0139	REF	81	LAST	774	31,2476	0 5516 0	TC	DOWNFLAG	PERMIT X-Axis OVERRIDE
0140	REF	3	LAST	220	31,2477	00311 1	ADRES	XCVINFLG	
0141	REF	82	LAST	794	31,2510	1 5516 0	TC	DOWNFLAG	
0142	REF	2	LAST	778	31,2501	0 1143 1	ADRES	REIFLAG	
0143	REF	2	LAST	791	31,2502	1 3514 0	TCF	VERTCLIC	
0144	REF	3	LAST	793	31,2513	1 5311 1	STARTP67	TC	NEWINDEX
0145					31,2514	00103 0	DEC	67	NO HARM IN "STARTING" P67 CVFR AND CVFR
0146	REF	145	LAST	793	31,2515	3 4755 1	CAF	ZERC	SC NO NEED FOR A FASTCHG AND NO NEED
0147	REF	1			31,2506	55'746 1	TS	RCDCOUNT	TO SEE IF ALREADY IN P67.
0148	REF	6	LAST	460	31,2517	3 4363 0	CAF	TFN	
0149	REF	1			31,2510	1 2470 1	TCF	VRTSTART	
0150	REF	12	LAST	789	31,2511	4 1011 0	STABL?	CS	MCDREF
0151	REF	2	LAST	798	31,2512	6 2433 1	AD	DEC66	ARE WE IN P66 EVEN THO WE MAY BE IN
0152					31,2513	1 0016 1	EXTEND		AUTC CAF?
0153	REF	1			31,2514	1 2532 0	BZF	PESTART?	YES. CC AND CHECK FOR A RESTART.
0154	REF	31	LAST	791	31,2515	3 4737 0	CAF	BIT13	NO. UN-ATTITUDE-HOLD DISCRETE PRESENT?
0155					31,2516	0 1116 1	EXTEND		
0156	REF	3	LAST	478	31,2517	02 031 1	RAND	CHAN31	
0157	REF	234	LAST	793	31,2520	10 000 0	CCS	A	
0158	REF	2	LAST	792	31,2521	1 2537 0	TCF	GUILDRET	YES: ALL'S WELL
0159	REF	12	LAST	794	31,2522	4 1011 0	PE6NCW?	CS	MCDPEG
0160	REF	3	LAST	794	31,2523	6 2433 1	AD	DEC66	
0161					31,2524	6 0006 1	EXTEND		
0162	REF	2	LAST	794	31,2525	1 2532 0	BZF	RESTART?	
0163	REF	2	LAST	794	31,2526	3 1746 0	CA	RCDCOUNT	NO. HAS THE PCD SWITCH BEEN "CLICKED"?
0164					31,2527	0 0016 1	EXTEND		
0165	REF	3	LAST	794	31,2530	1 2537 0	BZF	GUILDRET	NO. CONTINUE WITH AUTOMATIC LANDING.
0166	REF	1			31,2531	1 2431 1	TCF	STARTP66	YES. SWITCH INTO THE RCD MCDP.
0167	REF	26	LAST	521	31,2532	3 0175 0	PESTART?	CA	FLAGWROI
0168	REF	2	LAST	218	31,2533	7 4740 1	MASK	RCDFLBIT	HAS THERE BEEN A RESTART?
0169					31,2534	0 0076 1	EXTEND		
0170	REF	1			31,2535	1 2437 1	BZF	STRTP66A	YES. REINITIALIZE BUT LEAVE VCGVERT AS IS.
0171									
0172	REF	2	LAST	794	31,2536	1 3514 0	TCF	VERTCLIC	NO: CONTINUE WITH P.C.D.

L LUNAR LANDING GUIDANCE EQUATIONS

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01173 *****
 01175 INITIALIZATION FOR THIS PASS
 01176 *****

01178 REF 2 LAST 791 TO 793: 42 45# COUNT# 55/F2DPS

01179 REF 146 LAST 794 21,2537 3 4755 1 GLILORFT CAF ZFRF
 01180 REF 3 LAST 794 21,2540 55'746 1 TS RDCOUNT

01181 21,2541 0 2006 1 +2 EXTEND
 01182 REF 3 LAST 779 21,2542 2 1625 1 DCA TPIP
 01183 REF 1 21,2543 53'574 1 DXCH TPIPCLD

01184 REF 2 LAST 792 21,2544 0 3717 0 TC FASTCHNG

01185 21,2545 0 7706 1 EXTEND
 01186 REF 7 LAST 780 21,2546 2 1561 1 DCA PIPTIME1
 01187 REF 4 LAST 795 21,2547 53'625 0 DXCH TPIP

01188 21,2550 0 0106 1 EXTEND
 01189 REF 4 LAST 779 21,2551 2 1643 1 DCA TTF/8
 01190 REF 2 LAST 150 21,2552 53'553 1 DXCH TTF/8TMP

01191 REF 4 LAST 778 21,2553 11'623 0 CCS FLPASS1
 01192 REF 2 LAST 791 21,2554 1 2612 1 TCF TTFINCR

01193 REF 4 LAST 794 21,2555 51'346 1 RPSPDT1 INDEX WCHPHASE
 01194 REF 1 21,2556 1 2247 1 TCF NEWPHASE

01195 *****
 01197 RLTIMES TO START NEW PHASE
 01198 *****

0200 REF 4 LAST 794 21,2557 0 5311 1 P65START TC NEWMODEX
 0201 21,2560 0 0101 1 DCF 65
 0202 REF 48 LAST 794 21,2561 4 4752 1 CS TWC
 0203 REF 2 LAST 794 21,2562 55'647 1 TS WCHVEPT
 0204 REF 23 LAST 794 21,2563 0 5516 0 TC DOWNFLAG
 0205 REF 4 LAST 794 21,2564 0 2111 1 ADRES XCVINFLG
 0206 REF 4 LAST 795 21,2565 1 2613 1 TCF TTFINCR

FEFMIT X-AXIS OVERRIDE

0207 REF 6 LAST 795 21,2566 0 5211 1 STARTP64 TC NEWMODEX
 0208 21,2567 0 0101 0 DCF 64
 0209 REF 1 21,2570 3 1425 0 CA DELTTFAP
 0210 REF 3 LAST 795 21,2571 27'552 0 ADS TTF/8TMP
 0211 21,2572 0 0104 0 INFINIT
 0212 REF 4 LAST 472 21,2573 0 6222 1 TC C13STALL
 0213 REF 27 LAST 774 21,2574 3 4742 0 CA BIT12
 0214 21,2575 0 0006 1 EXTEND

ENABLE PLPT10

L LUNAR LANDING GUIDANCE EQUATIONS

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0215	REF	15	LAST	793	31,2576	05 013 1	WCP	CHAN13	
0216	REF	1			31,2577	3 3727 0	CAF	P64DR	
0217	REF	2	LAST	213	31,2607	55 343 0	TS	DR	
0218	REF	84	LAST	795	31,2611	0 5516 0	TC	DOWNFLAG	INITIALIZE REDESIGNATION FLAG
0219	REF	3	LAST	794	31,2602	00143 1	APRES	REFFLAG	

A0220 (CONTINUE TO TTFINCR)

P0221 *****

R0223 INCREMENT TTF/R, UPDATE LAND FOR LUNAR ROTATION, DO OTHER USEFUL THINGS

R0224 *****

R0226 TTFINCR COMPUTATIONS ARE AS FOLLOWS:-

P0227 TTF/R UPDATED FOR TIME SINCE LAST PASS:

P0228 $TTF/R = TTF/R + (TPIP - TPIPOLD)/E$

R0229 LANDING SITE VECTOR UPDATED FOR LUNAR ROTATION:

R0230 - - - - -

R0232 $LAND = /LAND/ UNIT(LAND - LAND(TPIP - TPIPOLD) * WM)$

R0234 SLANT RANGE TO LANDING SITE, FOR DISPLAY:

P0235 - - - - -

R0236 $RANGEDSP = AEVAL(LAND - R)$

0237	REF	121	LAST	793	31,2603	6 6742 1	TTFINCR	TC	INTPRET	
0238					31,2604	45345 1		DLOAD	DSU	
0239	REF	5	LAST	795	31,2605	02625 0			TPIP	
0240	REF	2	LAST	795	31,2606	03574 1			TPIPOLD	
0241					31,2607	41461 1		SIR	PUSH	SHIFT SCALES DELTA TIME TO 2(17) CSECS
0242					31,2610	21214 0			IND	
0243					31,2611	47361 0		VXSC	VXV	
0244	REF	5	LAST	781	31,2612	03635 1			LAND	
0245	REF	2	LAST	121	31,2613	02325 1			WM	
0246					31,2614	47145 0		PVSU	RTB	
0247	REF	6	LAST	796	31,2615	03635 1			LAND	
0248	REF	2	LAST	34	31,2616	21727 0			NCFMUNIT	
0249					31,2617	76561 1		VXSC	VSL1	
0250	REF	3	LAST	120	31,2620	02233 1			/LAND/	
0251	REF	2	LAST	150	31,2621	17545 0		STOPL	LANDTEMP	
0252					31,2622	77776 1		EXIT		
0253	REF	304	LAST	789	31,2623	52 155 1	DXCH	REFAC		
0254	REF	4	LAST	795	31,2624	21 553 1	EAS	TTF/RTMP		NOW HAVE INCREMENTED TTF/R IN TTF/RTMP
0255	REF	4	LAST	795	31,2625	0 3717 0	TC	FASTCHNG		

L LUNAR LANDING GUIDANCE EQUATIONS

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0256					31,2626	0	106	1	EXTEND		
0257	FFF	5	LAST	796	31,2627	2	1553	0	EXT	TTF/RTMP	
0258	FFF	5	LAST	795	31,2631	53	643	0	EXCH	TTF/R	
0259	FFF	1			31,2621	0	3663	1	TC	TCISPSFT	
0260	FFF	2	LAST	337	31,2632	3	7721	1	CAF	PRI021	TEMPORARILY OVER-PRI0 CHARIN
0261	FFF	13	LAST	750	31,2633	0	5145	1	TC	PRI0CHNG	
0262	FFF	122	LAST	796	31,2634	5	6042	1	TC	INTPRET	
0263					31,2635		53375	0	VL0AD	VAC	ADD IN CORRECTION FROM ACUN 69
0264	FFF	3	LAST	796	31,2636		03545	0		LANDTEMP	
0265	FFF	4	LAST	123	31,2637	02	635	0		DLAND	
0266	FFF	7	LAST	796	31,2641		03635	1	STORE	LAND	
0267					31,2641		77646	0	ABVAL		RECOMPUTE /LAND/
0268	FFF	4	LAST	796	31,2642		2233	0	STORE	/LAND/	
0269					31,2643		77776	1	EXIT		
0270	FFF	5	LAST	796	31,2644	0	3717	0	TC	FASTCHNG	SINCE REFSIG MAY CHANGE LANDTEMP
0271	FFF	6	LAST	786	31,2645	3	5	14	1	CAF	EBANK5
0272	FFF	5	LAST	797	31,2646		54	003	0	EBANK=	DLAND
0273	FFF	27	LAST	787	31,2646					IS	EBANK
0274	FFF	147	LAST	795	31,2647	3	4755	1	CAF	ZERO	ZERO IN 65 REGISTERS
0275	FFF	6	LAST	797	31,2650	55	634	0	IS	DLAND	
0276	FFF	7	LAST	797	31,2651	55	635	1	IS	DLAND	+1
0277	FFF	9	LAST	797	31,2652	55	636	1	IS	DLAND	+2
0278	FFF	5	LAST	797	31,2653	55	637	0	IS	DLAND	+3
0279	FFF	10	LAST	797	31,2654	55	640	0	IS	DLAND	+4
0280	FFF	11	LAST	797	31,2655	55	641	1	IS	DLAND	+5
0281	FFF	8	LAST	787	31,2656	3	5016	0	CAF	EBANK7	
0282	FFF	1			31,2656				EBANK=	TREDES	
0283	FFF	28	LAST	797	31,2657	54	003	0	IS	EBANK	
0284	FFF	7	LAST	793	31,2660	3	4736	1	CAF	PRI020	
0285	FFF	14	LAST	797	31,2661	0	5146	1	TC	PRI0CHNG	
0286	FFF	5	LAST	795	31,2662	51	346	1	PSSPCT2	INDEX	WCHDPHASE
0287	FFF	1			31,2663	1	2253	1	TCF	PREGUIDC	
P0288	*****										
P0289	LANDING SITE PERTURBATION EQUATIONS										
P0290	*****										
0292	FFF	4	LAST	774	31,2664	3	0102	1	PEDESIC	CA	FLAGWRD6
0294	FFF	1			31,2665	7	4746	1		MASK	REDFLRIT
0295					31,2666		0005	1	EXTEND		
0296	FFF	3	LAST	791	31,2667	1	2773	1	BZF	RGVGCALC	NO: SKIP REDESIGNATION LOGIC
0297	FFF	2	LAST	797	31,267	3	1666	1	CA	TREDES	YES: HAS TREDES REACHED ZERO?

LUNAR LANDING GUIDANCE RELATIONS

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0298					31,2671	0 004 1	EXTEND		
0299	REF	4	LAST	797	31,2672	1 2773 1	EZF	REVCALC	YES: SKIP REDESIGNATION LOGIC
0300					31,2673	0 0004 0	ININT		
0301	REF	1			31,2674	3 1446 0	CA	ELINCR1	
0302	REF	2	LAST	150	31,2675	55 554 0	TS	ELINCR	
0303	REF	2	LAST	141	31,2676	3 1445 0	CA	AZINCR1	
0304	REF	2	LAST	15	31,2677	55 554 1	TS	AZINCR	
0305	REF	6	LAST	797	31,2710	3 3717 0	TC	FASTCHNG	
0306	REF	148	LAST	797	31,2711	3 4755 1	CA	ZEFO	
0307	REF	2	LAST	798	31,2712	55 5446 1	TS	ELINCR1	
0308	REF	3	LAST	798	31,2713	55 5445 1	TS	AZINCR1	
0309	REF	3	LAST	798	31,2714	55 555 1	TS	ELINCR +1	
0310	REF	3	LAST	798	31,2715	55 557 0	TS	AZINCR +1	
0311	REF	19	LAST	604	31,2726	3 0120 1	CA	FIXLOC	SET PC TO 1
0312	REF	6	LAST	606	31,2727	54 166 1	TS	PUSHLOC	
0313	REF	123	LAST	797	31,2717	2 6042 1	TC	INTERPRET	
0314					31,2711	52375 1	VLOAD	VSL	
0315	REF	8	LAST	797	31,2712	03635 1		LAND	
0316	REF	7	LAST	781	31,2713	03621 1		R	
0317					31,2714	41434 1	RTR	PUSH	PUSH DOWN UNIT (LAND - R)
0318	REF	3	LAST	796	31,2715	21727 0		NORMUNIT	
0319					31,2716	76425 1	VXV	VSL1	
0320	REF	2	LAST	115	31,2717	02154 0		YNBPIF	
0321					31,2720	65361 0	VXSC	PCFL	PUSH DOWN - ELINCR(YNB * UNIT(LAND - R))
0322	REF	4	LAST	798	31,2721	02555 1		ELINCR	
0323	REF	4	LAST	798	31,2722	03557 0		AZINCR	
0324					31,2723	52361 1	VXSC	VSL	
0325	REF	3	LAST	798	31,2724	02154 0		YNBPIF	
0326					31,2725	41455 0	VAD	PUSH	RESULTING VECTOR IS 1/2 REAL SIZE
0327					31,2726	45345 1	DLCAD	DSE	MAKE SURE REDESIGNATION IS NOT TOO CLOSE TO THE HORIZON
0328					31,2727	03001 0		0	
0329	REF	1			31,2730	05660 1		DIFFCRIT	
0330					31,2731	71240 1	BMN	DLCAD	
0331	REF	1			31,2732	62735 1		REDES1	
0332	REF	2	LAST	798	31,2733	05660 1		DIFFCRIT	
0333					31,2734	00001 0	STORE	0	
0334					31,2735	45345 1	REDES1	DSU	
0335	REF	9	LAST	798	31,2736	03635 1		LAND	
0336	REF	8	LAST	798	31,2737	03521 1		R	
0337					31,2740	74271 0	CDV	VXSC	
0338					31,2741	00001 0		0	
0339					31,2742	53455 0	VAD	UNIT	
0340	REF	9	LAST	798	31,2743	03521 1		R	
0341					31,2744	76561 1	VXSC	VSL1	
0342	REF	5	LAST	797	31,2745	02333 0		/LAND/	

L LUNAR LANDING GUIDANCE EQUATIONS

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0343	REF	4	LAST	797	31,2746	03545 0	STORE	LANDTEMP	
0344					31,2747	77776 1	EXIT		LOCKANGL WILL BE COMPUTED AT RGVGCALC
0345	REF	7	LAST	798	31,2750	0 2717 0	TC	FASTCHNG	
0346					31,2751	0 0316 1	EXTEND		
0347	REF	8	LAST	799	31,2752	3 1545 1	CCA	LANDTEMP	
0348	REF	10	LAST	799	31,2753	53 635 1	DXCH	LAND	
0349					31,2754	0 0006 1	EXTEND		
0350	REF	6	LAST	799	31,2755	2 1547 0	CCA	LANDTEMP +2	
0351	REF	11	LAST	799	31,2756	52 637 0	DXCH	LAND +2	
0352					31,2757	0 0006 1	EXTEND		
0353	REF	7	LAST	799	31,2760	2 1551 1	CCA	LANDTEMP +4	
0354	REF	12	LAST	799	31,2761	52 641 1	DXCH	LAND +4	
0355	REF	8	LAST	799	31,2762	1 2773 1	TCF	RGVGCALC	

R0356 *****
 R0358 COMPUTE STATE IN GUIDANCE COORDINATES
 R0359 *****

R0361 PRCVGCALC COMPUTATIONS ARE AS FOLLOWS:-

R0362 VELOCITY RELATIVE TO THE SURFACE:

R0363 - - - -
 R0364 $\Delta CTERM = V + R * WM$

R0365 STATE IN GUIDANCE COORDINATES:

R0366 - * - -
 R0367 $RCU = CC (R - LAND)$

R0368 - * - -
 R0369 $VCU = CC (V - WM * R)$

R0370 HORIZONTAL VELOCITY FOR DISPLAY:

R0371 $VHORIZ = \frac{8 \cdot ARVAL (C, V_0, V_0)}{2 \cdot 1}$
 R0372

R0373 DEPRESSION ANGLE FOR DISPLAY:

R0374 - - -
 R0375 $LOCKANGL = \arcsin(\text{UNIT}(R - LAND) \cdot XMEP1P)$

0376	OFF	124	LAST	798	31,2763	7 6042 1	CALCPGVG TO	INTERPT	IN IGNALC, COMPUTE V FROM INTEGRATION
0377					31,2764	64375 1	VL0AC	MXV	CUTPLT AND TRIM CORRECTION TERM
0378	OFF	14	LAST	781	31,2765	00025 0		VATT1	COMPUTED LAST PASS AND LEFT IN LNF0/2
0379	REF	27	LAST	770	31,2766	11734 0		DEFSMNAT	

L LUNAR LANDING GUIDANCE EQUATIONS

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0380					31,2767	53262 0	VSP1	VAC		
0381	REF	6	LAST	781	31,2771	02254 1		UNFC/2		
0382	REF	4	LAST	781	31,2771	03527 1	STORE	V		
0383					31,2772	77776 1	EXIT			
0384	REF	125	LAST	799	31,2773	016142 1	REVGSCALC	TC	INTERPT	ENTER HERE TO RECCNPUTE RE AND VG
0385					31,2774	47375 0	VICAD	VXV		
0386	REF	10	LAST	799	31,2775	02521 1		0		
0387	REF	3	LAST	796	31,2776	02225 1		WM		
0388					31,2777	71455 1	VAC	VSR2		RESCALE TO UNITS OF 2(9) M/C/S
0389	REF	5	LAST	800	31,2778	02527 1		V		
0390	REF	2	LAST	120	31,3001	02265 1	STORE	ANCTERM		
0391					31,3002	77721 0	MXV			
0392	REF	5	LAST	770	31,3003	02575 1		CG		NO SHIFT SINCE ANCTERM IS CCUELF SIZED
0393	REF	6	LAST	780	31,3004	03627 1	STORE	VEU		
0394					31,3005	55525 0	POCL	VCLF		FCFM (1,VG,VE) IN UNITS OF 2(10) M/C/S
0395	REF	14	LAST	793	31,3006	06524 1		ZFKOVECS		2 1
0396					31,3007	52446 0	ABVAL	SL3		
0397	REF	3	LAST	316	31,3010	26263 1	STEVL	VHPTZ		VHCF12 FOR DISPLAY DURING P65.
0398	REF	11	LAST	800	31,3011	03521 1		R		- -
0399					31,3012	41451 1	VSL	PUSH		PUSH DOWN R - LANE
0400	REF	13	LAST	799	31,3013	03635 1		LAND		
0401					31,3014	76521 0	MXV	VSL1		
0402	REF	6	LAST	800	31,3015	02575 1		CG		
0403	REF	6	LAST	780	31,3016	02627 0	STORE	RGH		
0404					31,3017	77646 0	ABVAL			
0405	REF	3	LAST	316	31,3021	26617 0	STEVL	PANGEDSP		
0406					31,3021	50234 1	RTB	DCT		NOW IN MPAC IS SINF(LOCKANGL)/4
0407	REF	4	LAST	790	31,3022	21727 0		ACPMUNIT		
0408	REF	2	LAST	115	31,3023	02146 0		XNRP1P		
0409					31,3024	77776 1	EXIT			
0410	REF	20	LAST	798	31,3025	31120 1	CA	FIXLOC		RESET PUSH DOWN PCINTER
0411	REF	7	LAST	798	31,3026	54166 1	TS	PUSHLOC		
0412	REF	205	LAST	796	31,3027	30154 1	CA	MPAC		COMPUTE LOCKANGL ITSELF
0413					31,3030	61006 1	DOUBLE			
0414	REF	220	LAST	794	31,3031	04616 1	TC	PANKCALL		
0415	REF	1			31,3032	61657 1	CADR	SPARCSIN -1		
0416	REF	1			31,3033	63733 0	AD	1/2DEG		
0417					31,3034	00016 1	EXTEND			
0418	REF	1			31,3035	73732 0	MP	18 DEGS		
0419	REF	1			31,3036	551667 0	TS	LOCKANGL		LOCKANGL FOR DISPLAY DURING P64
0420	REF	6	LAST	797	31,3037	511246 1	PPSPCT3	INDEX	WCHPHASE	
0421	REF	1			31,3040	12257 0	TCF	WHATGLID		

R0422 *****

R0424 TTF/R COMPUTATION

R0425 *****

L LUNAR LANDING GUIDANCE EQUATIONS

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0427	REF	1		31,3041	0 3656	1	TTF/BCL	TC	INTPTX	
0428				31,3142	77743	1		FLCAD*		
0429	REF	1		31,3243	12431	0			JCG2TTF,1	
0431	REF	2	LAST	150	31,3144	23571	0	STOOL*	TABLTTF +6	A(31) = 8 JCG TC TABLTTF
0431	REF	1			31,3145	12427	1		ACC2TTF,1	2
0432	REF	3	LAST	801	31,3246	17567	0	STOOL	TABLTTF +4	A(21) = 6 ACC TC TABLTTF
0433	REF	7	LAST	80	31,3147	02633	1		VCU +4	2
0434					31,315	42615	1	DMP	DMP*	
0435	REF	1			31,3151	05656	1		3/4DP	
0436	REF	1			31,3152	12425	0		VCG2TTF,1	
0437	REF	4	LAST	801	31,3153	23565	0	STOOL*	TABLTTF +2	A(1) = (6 VCU + 18 VCG)/8 TO TABLTTF
0438	REF	1			31,3154	02417	0		RDG +4,1	2 2
0439					31,3155	41225	1	DSU	DMP	
0440	REF	7	LAST	800	31,3156	02633	0		RGL +4	
0441	REF	1			31,3157	05654	0		3/4DP	
0442	REF	5	LAST	801	31,3160	03563	1	STCRF	TABLTTF	A(0) = -24(RGL - RDG)/64 TC TABLTTF
0443					31,3161	77776	1	EXIT		2 2
0444	REF	28	LAST	615	31,3162	3 4744	1	CA	BITP	
0445	REF	6	LAST	801	31,3163	551572	1	TC	TABLTTF +10	FRACTIONAL PRECISION FOR TTF TO TABLE
0446					31,3164	3 1643	1	EXTEND		
0447	REF	6	LAST	797	31,3165	3 1643	1	CCA	TTF/8	
0448	REF	36	LAST	800	31,3166	52 155	1	CXCH	MFAC	LOADS TTF/8 (INITIAL GUESSES INTO MFAC)
0449	REF	49	LAST	795	31,3167	3 4752	0	CAF	TWC	DEGREE - ONE
0450	REF	112	LAST	767	31,3170	54 111	1	TS	L	
0451	REF	1			31,3171	3 2725	1	CAF	TABLTTF	
0452	REF	1			31,3172	0 3532	0	TC	PCCTPSRS	YIELDS TTF/8 IN MFAC
0453	REF	7	LAST	800	31,3172	511346	1	INDEX	WCHPHASE	
0454	REF	1			31,3174	1 2275	0	TCF	WHATALM	
0455					31,3175	0 0006	1	EXTEND		GOOD RETURN
0456	REF	317	LAST	801	31,3176	3 0155	0	CCA	MFAC	FETCH TTF/8 KEEPING IT IN MFAC
0457	REF	7	LAST	801	31,3177	531643	0	CXCH	TTF/8	CORRECTED TTF/8
0458	REF	2	LAST	797	31,3178	0 3663	1	TC	TCISPSET	

A0459

(CONTINUE TO QUAEGUINI)

P0460 *****

R0462 MAIN GUIDANCE EQUATION

R0463 *****

R0465 AS PUBLISHED:-

R0466

R0467

R0468

R0469

$$ACG = AEC + \frac{6(VCC + VCI)}{TTF} + \frac{12(RDG - RGI)}{(TTF1(TTF1))}$$

LLMARY LANDING GUIDANCE EQUATIONS

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E7 S3

PC470 AS HERE PROGRAMME:-

PC471

PC472

PC473

PC474

PC475

PC476

3 (1/4(RDG - RG) - - -)

- (----- + VCC + VC)

- 4 (TTF/8) -

ACC = ----- + ACC

TTF/8

0477	REF	8	LAST	801	31,3101	4 1642 1	QUADGUIL	CS	TTF/8	
0478	REF	1			31,3102	6 1426 0	AD	LEADTIME		LEADTIME IS A NEGATIVE NUMBER
0479	REF	16	LAST	789	31,3103	6 4733 1	AD	PCSMAX		SAFEGUARD THE COMPUTATIONS THAT FOLLOW
0480	REF	114	LAST	801	31,3104	54 001 1	TS	L		BY FORCING -TTF+LEADTIME > CR = ZERO
0481	REF	115	LAST	802	31,3105	4 0001 1	CS	L		
0482	REF	116	LAST	802	31,3106	6 0001 1	AD	L		
0483					31,3107	22 007 0	ZL			
0484					31,3110	0 0006 1	EXTEND			
0485	REF	9	LAST	802	31,3111	11 1642 1	EV	TTF/8		
0486	REF	57	LAST	795	31,3112	54 130 1	TS	BLF		- RATIO OF LAG-DIMINISHED TTF TO TTF
0487					31,3113	0 0006 1	EXTEND			
0488					31,3114	7 0000 0	SQUARE			
0489	REF	58	LAST	802	31,3115	54 131 0	TS	BLF +1		
0490	REF	59	LAST	802	31,3116	6 0130 0	AD	BLF		
0491	REF	60	LAST	802	31,3117	56 131 1	XCF	PUF +1		RATIO SQUARED - RATIO
0492	REF	61	LAST	802	31,3120	6 0131 1	AD	BLF +1		
0493	REF	308	LAST	801	31,3121	54 154 0	TS	MPAC		COEFFICIENT FOR VGU TERM
0494	REF	62	LAST	802	31,3122	6 0131 1	AD	BLF +1		
0495	REF	21	LAST	801	31,3123	50 120 1	INDEX	FIXLCC		COEFFICIENT FOR RDG-RGL TERM
0496					31,3124	54 032 1	TS	240		
0497	REF	63	LAST	802	31,3125	6 0131 1	AD	BLF +1		
0498	REF	22	LAST	802	31,3126	50 120 1	INDEX	FIXLCC		COEFFICIENT FOR VDG TERM
0499					31,3127	54 034 1	TS	280		
0500	REF	64	LAST	802	31,3130	6 0130 0	AD	BLF		
0501	REF	17	LAST	802	31,3131	6 4733 1	AD	PCSMAX		
0502	REF	65	LAST	802	31,3132	6 0131 1	AD	BLF +1		
0503	REF	66	LAST	802	31,3133	6 0131 1	AD	BLF +1		
0504	REF	23	LAST	802	31,3134	50 120 1	INDEX	FIXLCC		COEFFICIENT FOR ACC TERM
0505					31,3135	54 036 0	TS	300		
0506	REF	149	LAST	798	31,3136	2 4755 1	CAF	ZERO		
0507	REF	8	LAST	606	31,3137	54 163 1	TS	MODE		
0508	REF	2	LAST	801	31,3140	0 2656 1	TC	INTPRETX		
0509					31,3141	65261 1	VXSC	PDNL		
0510	REF	5	LAST	801	31,3142	13627 1		VGU		
0511					31,3143	10035 1		2RD		
0512					31,3144	62757 0	VXSC*	PDVL*		
0513	REF	1			31,3145	62411 1		VCC,1		
0514	REF	2	LAST	801	31,3146	62403 1		RDG,1		
0515					31,3147	70251 0	VSU	V/SC		

L LUNAR LANDING GUIDANCE EQUATIONS

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0516	REF	8	LAST	801	31,3150	02627 0		DGL		
0517	REF	10	LAST	802	31,3151	03643 0		TTF/8		
0518					31,3152	74242 1		VSR2	VXSC	
0519					31,3153	00333 1			2ED	
0520					31,3154	03285 0		VAC	VAC	
0521					31,3155	74341 1		V/SC	VXSC	
0522	REF	11	LAST	803	31,3156	03643 0			TTF/8	
0523	REF	2	LAST	801	31,3157	05656 1			3/4DF	
0524					31,3160	73725 0		PDDL	VXSC*	
0525					31,3161	00137 0			3DP	
0526	REF	1			31,3162	02417 1			ACG,1	
0527					31,3163	71655 1		VAC		
0528					31,3164	76505 0	AFCCALC1	VXM	VSL1	VERTICUL COMES HERE
0529	REF	7	LAST	800	31,3165	02875 1			CG	
0530					31,3166	73415 1		PDVL	V/SC	
0531	REF	5	LAST	779	31,3167	01236 1			GET/2	
0532	REF	1			31,3170	05652 0			GCAL	
0533					31,3171	45445 0		EVSU	STADR	
0534	REF	7	LAST	800	31,3172	74523 0		STORE	UNFC/2	UNFC/2 NEED NOT BE INITIALIZED
0535					31,3173	77646 0		ARVAL		
0536	REF	2	LAST	786	31,3174	17464 1	AFCCALC2	STCDL	/AFC/	MAGNITUDE OF AFC FOR THROTTLE
0537	REF	3	LAST	802	31,3175	02254 1			UNFC/2	VERTICAL COMPONENT
0538					31,3176	65316 0		DSQ	PCL	
0539	REF	9	LAST	803	31,3177	02256 0			UNFC/2 +2	CUT-OF-PLANE
0540					31,3177	65316 0		DSQ	PDDL	
0541	REF	1			31,3201	05650 1			HICHESTF	
0542					31,3202	63471 0		EDV	DSQ	
0543	REF	6	LAST	789	31,3203	01244 1			MASS	
0544					31,3204	45225 0		DSL	DSU	AMAXHPC12 = SQRT(ATOTAL ² - A ² - A ²)
0545					31,3205	71244 0		BPL	DLOAD	1 0
0546	REF	1			31,3206	63210 1			AFCCALC3	
0547	REF	15	LAST	800	31,3207	06824 1			REFDVCS	
0548					31,3210	43366 0	AFCCALC3	SQRT	DAF	
0549	REF	10	LAST	803	31,3211	03260 0			UNFC/2 +4	
0550					31,3212	44244 0		RPL	BCSU	
0551	REF	1			31,3213	62216 1			AFCCLEND	
0552	REF	11	LAST	803	31,3214	03261 0			UNFC/2 +4	
0553	REF	12	LAST	803	31,3215	02260 0		STORE	UNFC/2 +4	
0554					31,3216	77776 1	AFCCLEND	EXIT		
0555	REF	8	LAST	790	31,3217	03717 0		TC	FASTCHNG	
0556	REF	8	LAST	801	31,3220	01346 1		CA	WCHPHASE	PREPARE FOR PHASE SWITCHING LOGIC
0557	REF	4	LAST	794	31,3221	551321 1		TS	WCHPHCLD	
0558	REF	5	LAST	795	31,3222	251622 1		INCR	FLPASSQ	INCREMENT PASS COUNTER
0559	REF	9	LAST	802	31,3223	511346 1	EPSPOT4	INDEX	WCHPHASE	
0560	REF	1			31,3224	12263 1		TCF	AFTPLGIC	

R0561 *****
R0563 NEW PHASE NOW?

L LUNAR LANDING GUIDANCE RELATIONS

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R0564 *****

0564	REF	12	LAST	802	31,3225	51,346 1	EXTLOGIC INDEX	WCHPHASE	IS TTF NEARER ZERO THAN CRITERION?
0567	REF	2	LAST	140	31,3226	2 1423 0	CA	TFACERAK	
0568	REF	12	LAST	802	31,3227	6 1642 0	AD	TTF/8	
0569					31,3230	0 0006 1	EXTEND		
0570	REF	2	LAST	791	31,3231	6 3240 1	RZMF	CGCALC	NO
0571	REF	2	LAST	803	31,3232	0 3717 0	TC	FASTCHIG	YES: INCREMENT WCHPHASE, ZEPG FLPASS)
0572	REF	5	LAST	802	31,3233	2 1621 0	CA	WCHPHASE	
0573	REF	87	LAST	785	31,3234	6 4753 1	AD	ONE	
0574	REF	11	LAST	804	31,3235	55,346 0	TS	WCHPHASE	
0575	REF	15	LAST	802	31,3236	2 4755 1	CAF	ZERO	
0576	REF	6	LAST	803	31,3237	55,623 0	TS	FLPASS	

A0577

(CONTINUE TO CCCALC)

R0578 *****

R0580 PROECT GUIDANCE-STABLE MEMBER TRANSFORMATION MATRIX

R0581 *****

0583	REF	7	LAST	797	31,3240	3 5014 1	CCCALC	CAF	FBANK
0584	REF	25	LAST	797	31,3241	54 003 0		TS	FBANK
0585	REF	2	LAST	122	31,1435			EBANK=	TCGIBRAK
0586					31,3242	0 0006 1		EXTEND	
0587	REF	12	LAST	804	31,3243	5 1346 1		INDEX	WCHPHASE
0588	REF	1			31,3244	5 2400 1		INDEX	TARGETX
0589	REF	2	LAST	122	31,3245	3 1435 1		CCA	TCGFBRK
0590	REF	17	LAST	742	31,3246	24 006 1		INCP	BBANK
0591	REF	18	LAST	804	31,3247	24 006 1		INCP	BBANK
0592	REF	12	LAST	804	31,1642			FBANK=	TTF/8
0593	REF	14	LAST	804	31,3250	6 1642 0		AD	TTF/8
0594	REF	117	LAST	802	31,3251	56 001 0		XCF	L
0595	REF	15	LAST	804	31,3252	6 1642 0		AD	TTF/8
0596	REF	235	LAST	794	31,3253	10 000 0		CCS	A
0597	REF	118	LAST	804	31,3254	10 001 1		CCS	L
0598	REF	1			31,3255	1 3206 0		TCF	EXITSECT
0599	REF	2	LAST	804	31,3256	1 3206 0		TCF	EXITSPOT
0600					31,3257	13 260 1		NCCP	
0601	REF	3	LAST	802	31,3260	0 2656 1		TC	INTERPTX
0602					31,3261	53575 0		VLQAC	UNIT
0603	REF	14	LAST	800	31,3262	4,7635 1		LAND	
0604	REF	8	LAST	803	31,3263	16575 1		STOOL	CG
0605	REF	16	LAST	804	31,3264	73643 0			TTF/8
0606					31,3265	742 3 0		CMF*	VXSC
0607	REF	2	LAST	122	31,3266	02433 1			GAINBRAK, 1
0608	REF	2	LAST	800	31,3267	02265 1			ANGTERM
0609					31,327	77655 1		VAD	

NUMERIC MYSTERICSC

L LUNAR LANDING GUIDANCE EQUATIONS

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0610	REF	15	LAST	804	31,3271	03635	1		LAND	
0611					31,3272	47151	0	VSL	RTR	
0612	REF	12	LAST	800	31,3273	03521	1		R	
0613	REF	5	LAST	800	31,3274	21727	0		NCRPMUNIT	
0614					31,3275	47135	1	VXV	RTR	
0615	REF	16	LAST	805	31,3276	03635	1		LAND	
0616	REF	6	LAST	805	31,3277	21727	0		NCRPMUNIT	
0617	REF	9	LAST	804	31,3311	26603	0	STOVL	CG +6	SECOND RCW
0618	REF	10	LAST	805	31,3311	02575	1		CG	
0619					31,3312	76435	1	VXV	VSL1	
0620	REF	11	LAST	805	31,3313	02603	0		CG +6	
0621	REF	12	LAST	805	31,3314	02611	0	STOVL	CG +14	
0622					31,3315	77776	1		EXIT	
0623	REF	6	LAST	804	31,3306	511621	0	EXITSECT	INDEX	WCHPFCLO
0624	REF	1			31,3317	12367	0	TCF	WCHPFCLO	
0625	*****									
0627	ROUTINES FOR EXITING FROM LANDING GUIDANCE									
0628	*****									
0630	1.	EXGSLB IS THE RETURN WHEN GLIDSUB IS CALLED BY THE IGNITION ALGORITHM.								
0632	2.	EXEPAK IN THE EXIT USED DURING THE BRAKING PHASE. IN THIS CASE UNIT(R) IS THE WINDOW POINTING VECTOR.								
0634	3.	EXNCRM IS THE EXIT USED AT OTHER TIMES DURING THE BURN.								
0635	(EXNOVFLW IS A SUBROUTINE OF EXEPAK AND EXNCRM CALLED WHEN OVERFLOW OCCURRED ANYWHERE IN GUIDANCE.)									
0637	REF	126	LAST	800	31,3310	06042	1	EXGSLB	TC	INTPRFT
0638					31,3311	47175	1	VLCAD	RTR	COMPLETE TRIM VELOCITY CORRECTION TERM
0639	REF	13	LAST	803	31,3312	03254	1		UNFC/2	
0640	REF	7	LAST	805	31,3313	21727	0		NCRPMUNIT	
0641					31,3314	74361	0	VXSC	VXSC	
0642	REF	5	LAST	781	31,3315	03423	1		ZCCNTIME	
0643	REF	1			31,3316	22101	0		TRIMACCL	
0644	REF	14	LAST	805	31,3317	03254	1	STOVL	UNFC/2	
0645					31,3321	77776	1		EXIT	
0646	REF	3	LAST	792	31,3321	111647	1	CCS	NGUIDSUP	
0647	REF	1			31,3322	12416	0	TCF	GLIDSLP	
0648	REF	3	LAST	78	31,3323	111646	0	CCS	NIGNLCCF	
0649					31,3324	13327	0	TCF	+3	
0650	REF	31	LAST	765	31,3325	05567	0	TC	ALARM	
0651					31,3326	01412	1	OCT	01412	
0652	REF	40	LAST	782	31,3327	04635	0	+3	TC	PCSTJLMP
0653	REF	1			31,3328	65103	0	CADR	DDLMCALC	
0654	REF	127	LAST	805	31,3331	06042	1	EXEPAK	TC	INTPRFT

L LUNAR LANDING OUTRANCE EQUATIONS

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0655				31,2332	77775 1	VLOAD		
0656	REF	8	LAST	772	31,2333	13537 0	UNIT/2	
0657	REF	2	LAST	137	31,2334	03262 1	STORE	UNWC/2
0658					31,2335	77776 1	EXIT	
0659	REF	2	LAST	791	31,2336	1 3411 1	TCF	STORE?
0660	REF	123	LAST	805	31,2337	1 6742 1	EXNORN	TC
0661					31,2340	52375 1	VLOAD	INTPDET
0662	REF	17	LAST	805	31,2341	03635 1		VSL
0663	REF	13	LAST	805	31,2342	03521 1		LAND
0664					31,2343	77634 0		R
0665	REF	8	LAST	805	31,2344	21727 0	RTB	ACPMUNIT
0666	REF	3	LAST	806	31,2345	03262 1	STORE	UNWC/2
0667					31,2346	50235 0	VXV	DCT
0668	REF	3	LAST	806	31,2347	02146 0		XNPPIF
0669	REF	12	LAST	806	31,2350	02673 0		CG +6
0670					31,2351	77776 1	EXIT	WITH PROJ IN MPAC 1/8 PEAL SIZE
0671	REF	319	LAST	802	31,2352	4 0154 0	CS	MPAC
0672	REF	1			31,2353	6 3734 1	AD	PROJMAX
0673	REF	18	LAST	802	31,2354	6 4723 1	AD	PCSMAX
0674	REF	67	LAST	802	31,2355	54 131 1	TS	RLF
0675	REF	68	LAST	806	31,2356	4 0130 1	CS	RLF
0676	REF	69	LAST	806	31,2357	26 131 1	ADS	RLF
								RESULT IS 1 IF PROJMAX - PROJ NEGATIVE
0677	REF	1			31,2360	4 3735 1	CS	PROJMIN
0678	REF	310	LAST	806	31,2361	6 0154 1	AD	MPAC
0679	REF	19	LAST	806	31,2362	6 4723 1	AD	PCSMAX
0680	REF	70	LAST	806	31,2363	54 131 0	TS	RLF +1
0681	REF	71	LAST	806	31,2364	4 0131 0	CS	RLF +1
0682	REF	72	LAST	806	31,2365	26 131 0	ADS	RLF +1
								RESULT IS 0 IF PROJ - PROJMIN NEGATIVE
0683	REF	14	LAST	778	31,2366	3 4751 0	CAF	FCUR
0684	REF	15	LAST	595	31,2367	7 6245 0	UNWCLOCF	MASK
0685	REF	201	LAST	789	31,2370	54 002 1	TS	SIX
0686	REF	8	LAST	804	31,2371	3 5014 1	CA	Q
0687	REF	30	LAST	804	31,2372	54 002 0	CA	FRANKS
0688	REF	14	LAST	806	31,2373	2 0120 0	TS	FRANK
0689	REF	73	LAST	806	31,2374	0 0116 1	ERANK=	CG
0690					31,2375	5 0012 0	CA	RLF
0691	REF	202	LAST	806	31,2376	7 1610 0	EXTEND	Q
0692	REF	15	LAST	806	31,2377	24 776 1	INDEX	Q
0693	REF	19	LAST	804	31,2378	24 776 1	MP	CG +14
0694	REF	4	LAST	806	31,2379	24 776 1	INCR	RBANK
0695	REF	203	LAST	806	31,2380	5 0012 0	FRANK=	UNWC/2
0696	REF	5	LAST	806	31,2381	53 662 0	INDEX	Q
0697					31,2382	0 0006 1	EXCH	UNWC/2
0698	REF	74	LAST	806	31,2383	7 0131 0	EXTEND	
0699	REF	204	LAST	806	31,2384	50 002 0	MP	RLF +1
0700	REF	6	LAST	806	31,2385	21 662 0	INDEX	Q
							CAS	UNWC/2

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0701	REF 205	LAST	806	31,3406	10 012 1	CCS	G	
0702	REF 1			31,3407	1 2267 1	TCF	LNWCLCOP	
0703	REF 20	LAST	806	31,3410	24 006 1	INCR	BRANK	
0704	REF 11	LAST	785	31,3412		FRANK=	P1F	
0705	REF 20	LAST	755	31,3411	3 0076 0	STFR2	CA	FLAGWPD2
0706	REF 1			31,3412	7 4741 0	MASK	STFRBIT	IF STFRSW DOWN NO OUTPUTS
0707				31,3413	3 0006 1	EXTEND		
0708	REF 1			31,3414	1 3422 1	BZF	RATESTOP	
0709	REF 1			31,3415	3 0121 0	EXVERT	CA	OVFLND
0710				31,3416	3 0006 1	EXTEND		IF OVERFLOW ANYWHERE IN GUIDANCE
0711				31,3417	1 3422 0	BZF	+I3	CN'T CALL THRCTLR CR FINECCLW
0712	REF 22	LAST	805	31,3420	0 5567 0	EXCVFLW	TC	ALARM
0713				31,3421	01410 0	OUT		UI410
0714	REF 32	LAST	794	31,3422	3 4737 0	RATESTOP	CAF	RIT13
0715				31,3423	0 0006 1	EXTEND		ARE WE IN ATTITUDE-HOLD?
0716	REF 4	LAST	794	31,3424	02 0031 1	BRAND	CHAN31	
0717				31,3425	1 0006 1	EXTEND		
0718	REF 2	LAST	792	31,3426	1 3427 0	BZF	DISPEXIT	YES
0719	REF 221	LAST	800	31,3427	0 4616 1	TC	BANKCALL	NO: OF A STOPRATE
0720	REF 5	LAST	794	31,3430	40166 1	CADR	STOPRATE	
0721	REF 3	LAST	807	31,3431	1 3427 0	TCF	DISPEXIT	
0722	REF 1			31,3432	0 2144 1	COLMP1	TC	THRCTLR
0723	REF 120	LAST	806	31,3433	0 6042 1	TC	INTERPT	
0724				31,3434	77624 1	CALL		
0725	REF 2	LAST	765	31,3435	61076 1			FINDCCLW -2
0726				31,3436	77776 1	EXIT		

0727 (CONTINUE TO DISPEXIT)

0728 *****
 0730 GUIDANCE LOOP DISPLAYS
 0731 *****

0733				31,3437	0 0006 1	DISPEXIT	EXTEND	KILL GROUP 3: DISPLAYS WILL BE
0734	REF 14	LAST	736	31,3440	3 4755 1	CCA	NECC	RESTORED BY NEXT GUIDANCE CYCLE
0735	REF 2	LAST	725	31,3441	52 756 1	EXCF	-PHASE3	
0736	REF 4	LAST	807	31,3442		ENDLLJNR =	DISPEXIT +3	
0737	REF 12	LAST	731	31,3442	4 1104 0	+3	CS	FLAGWPD8
								IF FLAGWPD8 IS SET, NO DISPLAY THIS PASS

L LUNAR LANDING GUIDANCE EQUATIONS

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0738	REF	2	LAST	731	31,3443	7 4742 0	MASK	FLUNDBIT		
0739					31,3444	0 0016 1	EXTEND			
0740	REF	127	LAST	781	31,3445	1 5155 1	BZF	FNDCFJCB		
0741	REF	7	LAST	805	31,3446	51'621 1	INDEX	WCHPHOLD		
0742	REF	1			31,3447	1 2371 1	TCF	WFATCISP		
0743	REF	1			31,3450	2 2776 0	P63DISPS	CAF	V06N63	
0744	REF	222	LAST	807	31,3451	0 4616 1	DISPCCMN	TC	BANKCALL	
0745	REF	3	LAST	727	21,3452	20466 1	CACR	RECCDSP		
0746	REF	3	LAST	797	31,3453	3 1666 0	P64DISPS	CA	TREDFS	HAS TREDFS REACHED ZERC?
0747					31,3454	0 0016 1	EXTEND			
0748	REF	1			31,3455	1 2476 0	BZF	REF-CVER		YES: CLEAR REDESIGNATION FLAG
0749	REF	5	LAST	797	31,3456	4 0112 0	CS	FLAGWRD6		NO: IS REDFLAG SET?
0750	REF	2	LAST	757	31,3457	7 4746 1	MASK	REFLEBIT		
0751					31,3460	0 2016 1	EXTEND			
0752	REF	1			31,3461	1 3511 0	BZF	REDES-OK		YES: DO STATIC DISPLAY
0753	REF	1			31,3462	2 3737 1	CAF	V16N64		OTHERWISE USE FLASHING DISPLAY
0754	REF	223	LAST	808	31,3463	0 4616 1	TC	BANKCALL		
0755	REF	2	LAST	737	31,3464	20463 1	CACR	REFLASH		
0756	REF	29	LAST	785	31,3465	1 6011 1	TCF	GCTCPCH		TERMINATE
0757	REF	1			31,3466	1 3470 0	TCF	P64CEED		PROCEED PERMIT REDESIGNATIONS
0758	REF	2	LAST	752	31,3467	1 3453 1	TCF	P64DISPS		RECYCLE
0759	REF	151	LAST	804	31,3470	2 4755 1	P64CEED	CAF	ZERC	
0760	REF	3	LAST	798	31,3471	55'446 1	TS	FLINCR1		
0761	REF	4	LAST	758	31,3472	55'446 1	TS	AZINCR1		
0762	REF	53	LAST	775	31,3473	0 5514 0	TC	UPFLAG		ENABLE REDESIGNATION LOGIC
0763	REF	4	LAST	756	31,3474	0 0143 1	ADRES	REDFLAG		
0764	REF	128	LAST	808	31,3475	1 5155 1	TCF	FNDCFJCB		
0765	REF	85	LAST	796	31,3476	0 5516 0	RED-CVER	TC	DOWNFLAG	
0766	REF	5	LAST	808	31,3477	0 0143 1	ADRES	REFFLAG		
0767	REF	2	LAST	808	31,3511	2 2737 1	REDES-CK	CAF	V06N64	
0768	REF	1			31,3511	1 3451 0	TCF	DISPCCMN		
0769	REF	1			31,3512	2 3747 1	VFPTDISP	CAF	V06N64	
0770	REF	224	LAST	808	31,3513	0 4616 1	TC	BANKCALL		
0771	REF	3	LAST	808	31,3514	20463 1	CACR	REFLASH		
0772	REF	30	LAST	808	31,3515	1 6011 1	TCF	GCTCPCH		TERMINATE
0773	REF	1			31,3516	1 3511 1	TCF	STOPFIRE		PROCEED
0774	REF	2	LAST	808	31,3517	1 2510 1	TCF	STOPFIRE		V32E
0775					31,3510	1 0014 0				STOPFIRE INHIBIT

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0776	RFF 22E	LAST	808	31,3511	4616 1	TC	BANKCALL
0777	RFF 7	LAST	784	31,3512	4 154 0	CADP	ZATTEPDP
0778	RFF 12G	LAST	808	31,3513	1 5155 1	TCF	ENDOFJCB

R0779 *****

R0781 GUIDANCE FOR P65

R0782 *****

0784	RFF 3	LAST	795	31,3514	11'647 1	VEPTCLID CCS	WCHVERT
0785	RFF 1			31,3515	1 3524 0	TCF	P65VERT
0786	RFF 1			31,3516	1 3522 0	TCF	P66VERT

POSITIVE NON-ZEPC ---> P67

+1)

P0787 THE P65 GUIDANCE EQUATION IS AS FOLLOWS:-

R0788

R0789 V2FG - VGU

R0790 ACC = -----

R0791 T&LVERT

0792	RFF 13	LAST	807	31,3517	6042 1	P65VERT	TC	IATPRET
0793				31,3520	7765 1		GCTC	
0794	RFF 1			31,3521	65271 0			P65VERTA

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P0795 *****
 P0797 CLICANCE FOR P66
 P0798 *****

0800 PEF 47 LAST 805 31,3522 0 4625 0 P66VERT TC POSTJUMP
 0801 PEF 1 31,3523 65277 0 CACR P66VERTA

0802 PEF 57 LAST 792 31,3524 0 5253 1 P67VERT TC PHASCHNG TERMINATE GROUP 3
 0803 31,3525 00123 1 OCT 07013

0804 PEF 121 LAST 800 31,3526 0 6742 1 TC INTERPRET
 0805 31,3527 52175 0 VLOAD 07013
 0806 PEF 6 LAST 800 31,3530 03527 1 VLOAD 07013
 0807 PEF 1 31,3531 65526 0 VLOAD 07013

0808 PEF 1 32,3200 SEILCC P66LCC
 0809 32,3264 BANK
 0810 PEF 2 LAST 40 TC 41: 1 1* CCUNT# 44/F2CPS

0811 PEF 4 LAST 776 32,3264 3 7713 0 RCDTASK CAF PRID22
 0812 PEF 25 LAST 754 32,3265 0 5115 0 TC FINCVAC

0813 PEF 31 LAST 778 32,3266 03314 0 FBANK# DVCNTR
 0814 PEF 1 32,3267 64067 1 2CACR RCDCCMP

0815 PEF 55 LAST 776 32,3270 1 5261 0 TCF TASKOVER

0816 32,3271 52375 1 P65VERTA VLOAD VSU

0817 PEF 2 LAST 122 32,3272 02511 0 V2FG
 0818 PEF 4 LAST 902 32,3273 03627 1 VGL

0819 32,3274 52141 1 V/SC COTO

0820 PEF 2 LAST 122 32,3275 02517 0 TALVERT
 0821 PEF 1 32,3276 63164 1 AFCCAIC1

0822 PEF 58 LAST 810 32,3277 0 5353 1 P66VERTA TC PHASCHNG TERMINATE GROUP 3.
 0823 32,3278 00003 1 OCT 07013

0824 PEF 16 LAST 756 32,3301 3 4777 1 CAF ISEC

0825 PEF 21 LAST 774 32,3302 0 5173 1 TC TWILCLF

0826 PEF 1 32,3303 03264 1 ADRES RCDTASK

0827 32,3304 0 0014 0 RCDCCMP INHINT ✓

0828 PEF 152 LAST 808 32,3305 2 4755 1 CAF ZFFO

0829 PEF 4 LAST 795 32,3306 571746 0 XCF RCDCCUNT

0830 32,3307 0 1116 1 EXTEND

0831 PEF 3 LAST 792 32,3308 7 1756 0 MP RCDSCALL

0832 PEF 2 LAST 792 32,3311 211645 0 CAS VDGVERT UPDATE DESIRED ALTITUDE RATE.

0833 32,3312 0 0106 1 EXTEND

0834 PEF 8 LAST 295 32,3313 3 0141 0 PCA PIPAX SET CLCPIPAX, Y, Z = PIPAX, Y, Z

0835 PEF 3 LAST 792 32,3314 531764 1 EXCF CLCPIPAX

1 LUNAR LANDING GUIDANCE EQUATIONS

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0836	REF	22	LAST	522	32,3315	52 071 0	EXCH	PLPTREG1	SET PLPTREG1,2,3 = CLDPIPAX,Y,Z
0837	REF	3	LAST	385	32,3316	2 041 1	CA	PIPAZ	
0838	REF	2	LAST	152	32,3317	57 765 1	XCH	CLDPIPAZ	
0839	REF	2	LAST	373	32,3320	56 072 1	XCH	PLPTREG3	
0840					32,3321	0006 1	EXTEND		SNAPSHOT TIME OF PIPA READING.
0841	REF	24	LAST	755	32,3322	3 025 0	ACA	TIME2	
0842	REF	3	LAST	798	32,3323	53 762 1	EXCH	THISTPIP	
0843	REF	4	LAST	810	32,3324	2 1763 1	CA	CLDPIPAX	
0844	REF	1			32,3325	6 1157 0	AD	PIPATMPX	
0845	REF	311	LAST	806	32,3326	54 154 1	TS	MFAC	MPAC(X) = PIPAX + PIPATMPX
0846	REF	2	LAST	152	32,3327	3 1764 0	CA	CLDPIPAY	
0847	REF	1			32,3331	6 1160 1	AD	PIPATMPY	
0848	REF	312	LAST	811	32,3331	54 157 0	TS	MFAC +3	MPAC(Y) = PIPAY + PIPATMPY
0849	REF	3	LAST	811	32,3332	3 1765 1	CA	CLDPIPAZ	
0850	REF	1			32,3333	6 1161 0	AD	PIPATMPZ	
0851	REF	313	LAST	811	32,3334	54 161 0	TS	MFAC +5	MPAC(Z) = PIPAZ + PIPATMPZ
0852	REF	5	LAST	811	32,3335	4 1763 0	CS	CLDPIPAX	
0853	REF	3	LAST	793	32,3336	6 1253 1	AF	TFMX	
0854	REF	23	LAST	811	32,3337	6 0070 0	AD	PLPTREG1	
0855	REF	3	LAST	793	32,3338	55 766 0	TS	DELVRCD	
0856	REF	2	LAST	811	32,3341	4 1764 1	CS	CLDPIPAY	
0857	REF	2	LAST	105	32,3342	6 1254 0	AD	TFMY	
0858	REF	8	LAST	258	32,3343	6 0071 1	AD	PLPTREG2	
0859	REF	4	LAST	811	32,3344	55 770 1	TS	DELVRCD +2	
0860	REF	4	LAST	811	32,3345	4 1765 0	CS	CLDPIPAZ	
0861	REF	2	LAST	105	32,3346	6 1255 1	AD	TFMZ	
0862	REF	3	LAST	811	32,3347	6 0072 1	AD	PLPTREG3	
0863	REF	5	LAST	811	32,3350	55 772 0	TS	DELVRCD +4	
0864	REF	153	LAST	811	32,3351	3 4755 1	CAF	ZERC	
0865	REF	314	LAST	811	32,3352	54 155 1	TS	MPAC +1	ZERC LC-CRDER MFAC COMPONENTS
0866	REF	315	LAST	811	32,3353	54 160 1	TS	MFAC +4	
0867	REF	316	LAST	811	32,3354	54 162 0	TS	MPAC +6	
0868	REF	4	LAST	811	32,3355	55 253 0	TS	TFMX	ZERC TFMX, TFMY, AND TFMZ SC WE WILL
0869	REF	2	LAST	811	32,3356	55 254 1	TS	TFMY	KNOW WHEN READACCS CHANGES THEM.
0870	REF	3	LAST	811	32,3357	55 255 0	TS	TFMZ	
0871	REF	88	LAST	804	32,3360	4 4753 0	CS	ONE	
0872	REF	9	LAST	802	32,3361	54 163 1	TS	MCDE	
0873	REF	132	LAST	810	32,3362	2 6042 1	TC	INTERPT	
0874					32,3363	65361 0	ITRPNT1	VXSC	SCALE MPAC TO M/CS #2(-7) AND FLSE (-6)
0875	REF	1			32,3364	26722 0		PFOL	
0876	REF	4	LAST	811	32,3365	12762 1		KFIP1	
0877					32,3366	77625 1		THISTPIP	
0878	REF	15	LAST	793	32,3367	01224 0	DSU	PIFTIME	
0879					32,3370	10337 0	STORE	300	30-310 CONTAINS TIME IN CS SINCE FIFTIME
0880					32,3371	62271 0	CDV	PFVL	(F)
0881	REF	1			32,3372	27112 0		4SEC(28)	

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0882	REF	6	LAST	802	32,3373	01236 1	GET/2		
0883					32,3374	74251 1	VXSC		(6)
0884	REF	2	LAST	793	32,3375	02621 0	VBIAS		
0885					32,3376	53352 0	VSL2	VAF	
0886	REF	7	LAST	810	32,3377	03527 1	V		
0887					32,3400	45455 1	VAD	STADR	(C)
0888					32,3401	53746 1	STCVL	240	
0889	REF	14	LAST	806	32,3402	02521 1	R		STORE UPDATER VELOCITY IN 24-290
0890					32,3403	77656 1	UNIT		
0891					32,3404	00017 1	STORE	140	
0892					32,3405	72441 0	DOT	SL1	
0893					32,3406	00031 0		240	
0894	REF	7	LAST	793	32,3407	17474 0	STCDL	HCTEISP	UPDATE ALTITUDE RATE FOR ACUN 60
0895					32,3410	00037 0		300	
0896					32,3411	41261 1	SL	DMP	
0897					32,3412	20214 1		110	
0898	REF	8	LAST	812	32,3413	03474 0		HCTEISP	
0899					32,3414	45215 0	DAD	DSU	
0900					32,3415	00045 0		360	
0901	REF	6	LAST	798	32,3416	72333 0		/LINC/	
0902	REF	3	LAST	316	32,3417	17775 1	STOOL	HCALC1	UPDATE ALTITUDE FOR ACUN 60
0903	REF	5	LAST	812	32,3420	03474 0		HCTEISP	
0904					32,3421	56221 0	BDSL	DDV	
0905	REF	3	LAST	810	32,3422	03645 0		VDGVERT	
0906	REF	2	LAST	120	32,3423	02541 0		TAURCC	
0907					32,3424	51515 1	PDVL	ARVAL	(2)
0908	REF	7	LAST	812	32,3425	01236 1		GET/2	
0909					32,3426	60471 0	DDV	SR2	
0910	REF	2	LAST	803	32,3427	56552 0		GSCALE	
0911					32,3430	00025 0	STORE	200	
0912					32,3431	77615 0	PAC		(0)
0913					32,3432	45115 0	PCVL	CALL	(2)
0914	REF	10	LAST	785	32,3433	06522 1		UNITX	
0915	REF	2	LAST	715	32,3434	47663 1		CDL*NPSM	
0916					32,3435	77641 1	DOT		
0917					32,3436	00017 1		140	
0918					32,3437	00037 1	STORE	220	
0919					32,3440	45065 1	PCCV	STADR	(C)
0920	REF	4	LAST	802	32,3441	50213 0	STCVL	/AFC/	
0921	REF	6	LAST	811	32,3442	03767 1		DELVRCD	
0922					32,3443	53361 0	VXSC	VAD	
0923	REF	2	LAST	811	32,3444	26122 0		KPIPI	
0924	REF	3	LAST	812	32,3445	02621 0		VBIAS	
0925					32,3446	65246 1	ARVAL	PCDL	(2)
0926	REF	5	LAST	811	32,3447	03762 1		THISTPIP	
0927					32,3450	65225 1	DSU	PCDL	(4)
0928	REF	3	LAST	793	32,3451	03760 0		LASTTPIP	
0929	REF	6	LAST	812	32,3452	03762 1		THISTPIP	
0930	REF	4	LAST	812	32,3453	17767 0	STOOL	LASTTPIP	(2)
0931					32,3454	55271 0	DDV	RDDV	(0)

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0932	REF	1		32,3455	25544 0		SETTFACT	
0933				32,3456	41325 0	PDDL	DMP	(2)
0934	REF	7	LAST	794	32,3457	03611 1		FWIGHT
0935	REF	1			32,3460	25543 1		RITIF
0936					32,3461	56271 0	DDV	DDV
0937	REF	7	LAST	803	32,3462	01244 1		MASS
0938	REF	2	LAST	785	32,3463	22196 1		SCALEFAC
0939					32,3464	65215 1	EAC	PDCL
0940					32,3465	00001 0		2D
0941					32,3466	05025 0		2D
0942					32,3467	45271 1	DDV	DSU
0943					32,347	00027 1		220
0944					32,3471	43205 1	DMP	DAP
0945	REF	2	LAST	122	32,3472	02543 1		LAG/TAU
0946	REF	5	LAST	812	32,3473	03464 1		/AFC/
0947					32,3474	56325 0	PDDL	DDV
0948	REF	2	LAST	122	32,3475	02547 0		MAXFORCE
0949	REF	8	LAST	813	32,3476	01244 1		MASS
0950					32,3477	56325 0	PDDL	DDV
0951	REF	2	LAST	122	32,351	02545 1		MINFORCE
0952	REF	0	LAST	813	32,3511	01244 1		MASS
0953					32,3512	44206 0	PUSH	BDSU
0954					32,3513	00003 1		2D
0955					32,3514	71240 1	BMN	DLOAD
0956	REF	1			32,3515	65513 0		AFCSPCT
0957					32,3516	41545 0	DLOAD	PUSH
0958					32,3517	51121 0	BDSU	BPI
0959					32,3518	00013 1		2D
0960	REF	2	LAST	813	32,3511	65513 0		AFCSPCT
0961					32,3512	77745 1	DLFAC	
0962					32,3513	77745 1	AFCSPCT	DLFAC
0963					32,3514	776 1 0		SETPC
0964					32,3515	00003 1		2D
0965	REF	6	LAST	813	32,3516	17464 1	STCOL	/AFC/
0966					32,3517	77776 1	ITRPNT2	EXIT
0967	REF	317	LAST	811	32,3520	52 155 1	EXCH	MFAC
0968	REF	226	LAST	809	32,3521	4616 1	TC	BACKCALL
0969	REF	2	LAST	807	32,3522	62147 1	CAPP	THROTTLE +3
0970	REF	132	LAST	811	32,3523	6 6042 1	TC	INTERPT
0971					32,3524	77775 1	VLOAD	
0972					32,3525	00031 0		240
0973					32,3526	52352 0	VHORCOMP	VAD
0974	REF	2	LAST	152	32,3527	03734 1		DELVS
0975					32,3530	63342 1	VSR2	PDVL
0976	REF	15	LAST	812	32,3531	03521 1		0
0977					32,3532	74256 0	UNIT	VXSC
0978	REF	1	LAST	812	32,3533	03474 0		HDCTRISE
0979					32,3534	51272 1	VSL1	BVSU
0980					32,3535	77446 0	ARVAL	
0981	REF	4	LAST	800	32,3536	02263 1	STORE	VHORIZ

MFAC = MEASURED ACCELERATION.

PICK UP UPDATED VELOCITY VECTOR.

UPDATE HORIZONTAL VELOCITY FOR NGUN 60

L LUMAP LANDING GUIDANCE EQUATIONS

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0982          32,3537  77776 1          FX1T
0983  REF 227  LAST  813  32,3540  0 4616 1          TC  BANKCALL  FLT OF VC6A60 DISPLAY ELT AVOID PRASCFAC
0984  REF 5  LAST  817  32,3541  63442 0          CADP  DISPEXIT +3

0985          32,3542  00001 0  B111H  CCT  00001
0986          32,3543  00000 1  SFTFACT 2DEC  1 8-17
098A          32,3544  04001 0
0987          32,3545  00000 1  PIASFACT 2DEC  655.36 E-26
0987          32,3546  05075 0

PO98P *****
RO990 PEDESIGNATOR TRAP
RO991 *****

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0993          11,2312          BANK 11
0994  REF 1          11,2311          SFTLOC F2CPS*11
0995          11,2312          BANK

0996  REF 1          COUNT# 55/F2CPS

0997  REF 4  LAST  557  11,2312  56 016 0  PITFALL  XCH  BANKRLPT
0998          11,2313  0 0006 1          EXTEND
0999  REF 4  LAST  557  11,2314  22 012 1          GXCH  QRLPT

1000  REF 5  LAST  752  11,2315  0 5321 1          TC  CHECKVM  IF NOT IN P64, NO REASON TO CONTINUE
1001          11,2316  00100 0          DEC  64
1002  REF 18  LAST  558  11,2317  1 5270 0          TCF  RESUME

1003          11,2311  0 0006 1          EXTEND
1004  REF 5  LAST  807  11,2311  00 031 0          REAC  CH/131
1005          11,2312  4 0000 0          COM
1006  REF 1          11,2312  7 2401 1          MASK  ALL4BITS
1007  REF 3  LAST  156  11,2314  55 444 0          TS  ELVIRA
1008  REF 50  LAST  801  11,2315  3 4752 0          CAF  TWO
1009  REF 2  LAST  141  11,2316  55 443 1          TS  ZEPLINA
1010  REF 15  LAST  678  11,2317  3 4756 1          CAF  FIVE
1011  REF 22  LAST  810  11,2317  0 5173 1          TC  TWIDCLE
1012  REF 1          11,2321  02 226 1          ADRES  PEDESIGN
1013  REF 19  LAST  814  11,2322  1 5270 0          TCF  RESUME

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R1014 PEDESIGNATION MONITOR (INITIATED BY PITFALL)

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1015  REF 3  LAST  814  11,2323  55 443 1  PREMON1  TS  ZEPLINA
1016  REF 9  LAST  557  11,2324  3 4757 0  PREMON2  CAF  SEVEN
1017  REF 7  LAST  774  11,2325  0 5224 0          TC  VARDELAY
1018          11,2326  0 0006 1  PEDESIGN  EXTEND
1019          11,2327  00 031 0          REAC  31
1020          11,2328  4 0000 0          COM
1021  REF 2  LAST  814  11,2331  7 2401 1          MASK  ALL4BITS

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L LUNAR LANDING OUTPACE EQUATIONS

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1022	REF	4	LAST	814	11,2332	57'444 1	XCH	FLVIRA	
1023	REF	119	LAST	814	11,2333	54'011 1	TS	L	
1024	REF	5	LAST	815	11,2334	11'444 0	CCS	FLVIRA	DO ANY BITS APPEAR THIS PASS?
1025	REF	1			11,2335	1'2324 1	TCF	PR-MCN2	Y: CONTINUE MONITOR
1026	REF	120	LAST	815	11,2336	1'011 1	CCS	L	N: ANY LAST PASS?
1027	REF	1			11,2337	1'2347 1	TCF	CCOUNT'EM	Y: COUNT'EM, RESET RUPT, TERMINATE
1028	REF	4	LAST	814	11,2340	11'443 1	CCS	ZERLINA	N: HAS ZERLINA REACHED ZERO YET?
1029	REF	1			11,2341	1'2323 0	TCF	PR-MCN1	N: FINISH ZERLINA, CONTINUE
1030	REF	5	LAST	795	11,2342	0'6'22 1	RESETRPT	TC	C13STALL
1031	REF	28	LAST	795	11,2343	3'4740 0	CAF	BIT12	Y: RESET RUPT, TERMINATE
1032					11,2344	0'00'6 1	EXTEND		
1033	REF	16	LAST	796	11,2345	5'113 0	WCP	CHAN12	
1034	REF	56	LAST	810	11,2346	1'5201 0	TCF	TASKOVER	
1035	REF	23	LAST	807	11,2347	3'4737 0	CCOUNT'EM	CAF	BIT13
1036					11,2350	0'00'6 1	EXTEND		ARE WE IN ATTITUDE-FILE?
1037	REF	6	LAST	814	11,2351	02'031 1	RANC	CHAN31	
1038					11,2352	1'00'6 1	EXTEND		
1039	REF	1			11,2353	1'2342 1	RZF	RESRPT	YES: SKIP REDSIGNATION LOGIC.
1040	REF	121	LAST	815	11,2354	2'00'1 0	CA	L	NO
1041	REF	1			11,2355	7'4746 1	MASK	-AZBIT	
1042	REF	236	LAST	804	11,2356	10'000 0	CCS	A	
1043	REF	1			11,2357	4'2402 1	-AZ	CS	AZEACH
1044	REF	5	LAST	818	11,2360	27'445 1	ADS	AZINCR1	
1045	REF	122	LAST	815	11,2361	3'00'1 0	CA	L	
1046	REF	1			11,2362	7'4747 0	MASK	+AZBIT	
1047	REF	237	LAST	815	11,2363	10'000 0	CCS	A	
1048	REF	2	LAST	815	11,2364	3'2402 0	+AZ	CA	AZEACH
1049	REF	6	LAST	815	11,2365	27'445 1	ADS	AZINCR1	
1050	REF	123	LAST	815	11,2366	3'00'1 0	CA	L	
1051	REF	1			11,2367	7'4753 0	MASK	-FLBIT	
1052	REF	238	LAST	815	11,2370	10'000 0	CCS	A	
1053	REF	1			11,2371	4'2403 0	-FL	CS	FLZACH
1054	REF	4	LAST	818	11,2372	27'446 1	ADS	FLINCR1	
1055	REF	124	LAST	815	11,2373	3'00'1 0	CA	L	
1056	REF	1			11,2374	7'4752 1	MASK	+FLBIT	
1057	REF	239	LAST	815	11,2375	10'000 0	CCS	A	
1058	REF	2	LAST	815	11,2376	3'2403 1	+FL	CA	FLZACH
1059	REF	5	LAST	815	11,2377	27'446 1	ADS	FLINCR1	
1060	REF	2	LAST	815	11,2400	1'2342 1	TCF	RESETRPT	

R1061 THESE EQUIVALENCIES ARE BASED ON GSCP CHAPTER 4, REVISION 16 OF P64LM

1062 REF 38 LAST 715 4752 +FLBIT = BIT2 -FLITCH

L LUMAR LANDING GUIDANCE EQUATIONS

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1063 REF 28 LAST 753 4753 -EL9IT = BIT1 +FITCH

1064 REF 27 LAST 753 4747 +A2BIT = BITS

1065 REF 27 LAST 753 4746 -A2BIT = FIT6

1066 11,2401 00063 1 ALL4BITS OCT 00063

1067 11,2402 01074 0 A2FACE DEC .03491 2 DEGREES

1068 11,2403 0217 0 ELFACE DEC .00873 1/2 DEGREE

R1069 *****
 R1071 P.O.F. TRAP
 R1072 *****

1073 REF 1 23,2400 SFTLCC RCOTRAP

1074 23,2455 BANK

1075 REF 1 COUNT* \$\$/F2DPS

1077 REF 25 LAST 815 23,2455 7 4745 1 DESCRITS MASK BIT7 COME HERE FROM MARKRUPT CODING WITH BIT

1078 REF 24 LAST 815 23,2456 10 000 0 CCS A 7 OF 6 OF CHANNEL 16 IN A: BIT 7 MEANS

1079 REF 51 LAST 814 23,2457 4 4752 1 CS TWO - RATE INCREMENT, BIT 6 + INCREMENT

1080 REF 85 LAST 811 23,2460 6 4753 1 AC ONE

1081 REF 5 LAST 810 23,2461 27 746 1 ADS RCDCCLNT

1082 REF 20 LAST 814 23,2462 1 5270 0 TCF RESUME TRAP IS RESET WHEN SWITCH IS RELEASED

1083 31,3532 BANK 31

1084 REF 2 LAST 39 31,2111 SFTLCC F2DPS*31

1085 31,3532 BANK

1086 REF 4 LAST 755 TO R1075 F7 552* COUNT* \$\$/F2DPS

R1087 *****
 R1089 DOUBLE PRECISION ROOT FINDER SUBROUTINE (BY ALLAN KILNEFF)
 R1090 *****

R1092 N N-1
 R1093 ROOTPSFS FINDS CN ROOT OF THE POWER SERIES $A^N X + A^{N-1} X + \dots + A^1 X + A^0$
 R1095 N N-1 1 0

R1097 USING NEWTON'S METHOD STARTING WITH AN INITIAL GUESS FOR THE ROOT. THE ENTERING DATA MUST BE AS FOLLOWS:

L LUNAR LANDING GUIDANCE SOLUTIONS

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A1109	A	SP	LCC-3	ADRES FOR REFERENCING PWR CCF TABL
A1110	L	SP	N-1	N IS THE DEGREE OF THE POWER SERIES
A1111	MPAC	EP	X	INITIAL GLESS FOR ROOT
A1112	LCC-2N	EP	A(N)	
A1113		...		
A1114	LCC	EP	A(N)	
A1115	LCC+2	SP	PRECORRT	PREC 2ND OF ROOT (AS FRACT OF 1ST GLESS)

P1116 THE PP RESULT IS LEFT IN MPAC UPON EXIT, AND A SP COUNT OF THE ITERATIONS TO CONVERGENCE IS LEFT IN MPAC+2.
 R1119 RETURN IS NORMALLY TO LCC(TC ROOTPSRS)+3. IF ROOTPSRS FAILS TO CONVERGE IN 5 PASSES, RETURN IS TO LCC+1 AND
 R1117 OUTPUTS ARE NOT TO BE TESTED.

R1111 PRECAUTION: ROOTPSRS MAKES NO CHECKS FOR OVERFLOW OR FOR IMPROPER USAGE. IMPROPER USAGE COULD
 R1113 PRECLUDE CONVERGENCE OR REQUIRE EXCESSIVE ITERATIONS. AS A SPECIFIC EXAMPLE, ROOTPSRS FORMS A DERIVATIVE
 R1115 COEFFICIENT TABLE BY MULTIPLYING EACH A(I) BY I, WHERE I RANGES FROM 1 TO N. IF AN ELEMENT OF THE DERIVATIVE
 R1117 COEFFICIENT TABLE = 1 OR > 1 IN MAGNITUDE, ONLY THE EXCESS IS RETAINED. ROOTPSRS MAY CONVERGE ON THE CORRECT
 R1119 ROOT ANYHOW, BUT IT MAY TAKE AN EXCESSIVE NUMBER OF ITERATIONS. THEREFORE THE USER SHOULD RECOGNIZE:

R1121 1. USER'S RESPONSIBILITY TO ASSURE THAT $I \times A(I) < 1$ IN MAGNITUDE FOR ALL I.

R1123 2. USER'S RESPONSIBILITY TO ASSURE OVERFLOW WILL NOT OCCUR IN EVALUATING EITHER THE RESIDUAL OR THE DERIVATIVE
 P1125 POWER SERIES. THIS OVERFLOW WOULD BE PRODUCED BY SUBROUTINE POWRSRS, CALLED BY ROOTPSRS, AND MIGHT NOT
 R1127 PRECLUDE EVENTUAL CONVERGENCE.

R1129 3. AT PRESENT, ERASABLE LOCATIONS ARE RESERVED ONLY FOR N UP TO 5. AN N IN EXCESS OF 5 WILL PRODUCE CHAOS.
 R1130 ALL ERASABLE LOCATIONS BY ROOTPSRS ARE UNSWITCHED LOCATED IN THE REGION FROM MPAC-33 OCT TO MPAC+7.

P1122 4. THE ITERATION COUNT RETURNED IN MPAC+2 MAY BE USED TO DETECT ABNORMAL PERFORMANCE.

A1124 STORE ENTERING DATA, INITIALIZE ERASABLES

1135				41,3532	0	016	1	ROOTPSRS EXTEND		
1136	REF	1		31,3533	22	132	1	EXCH RETRPT		RETURN ACKES
1137	REF	1		31,3534	54	117	1	TS RWPTR		PWR TABL POINTER
1138	REF	318	LAST	31,3535	52	162	1	EXCH MPAC	+3	PWR TABL ADRES, N-1
1139	REF	1		31,3536	3	3655	1	CA CERTAPLL		
1141	REF	1		31,3537	54	141	1	TS DERPTR		DER TABL POINTER
1141	REF	319	LAST	31,3541	54	161	1	TS MPAC	+5	DER TABL ADRES
1142	REF	320	LAST	31,3541	17	161	1	POS MPAC	+4	NO POWER SERIES OF DEGREE 1 OR LESS
1143	REF	321	LAST	31,3542	54	162	0	TS MPAC	+6	N-2
1144	REF	154	LAST	31,3543	3	4755	1	CA ZERO		MODE USED AS ITERATION COUNTER. MODE
1145	REF	17	LAST	31,3544	54	163	1	TS MODE		MUST BE POS SC ABS WON'T COMP MPAC+3 ETC

A1146 COMPUTE CRITERION TO STOP ITERATING

1147				31,3545	0	0006	1	EXTEND		
1148	REF	222	LAST	31,3546	3	0155	0	PCA MPAC		FETCH ROOT GUESS, KEEPING IT IN MPAC
1149	REF	1		31,3547	52	127	1	EXCH ROOTPS		AND IN ROOTPS
1150	REF	223	LAST	31,3550	50	157	1	INDEX MPAC	+3	PWR TABL ADRES

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1151					31,3551	3 0115 1	CA	5	PREFCCT TO A
1152	REF	7	LAST	464	31,3552	0 7212 0	TC	SHORTMP	YIELDS OF PRODUCT IN MPAC
1153	REF	2	LAST	404	31,3553	0 4713 0	TC	USPPCADR	
1154	REF	1			31,3554	0 1226 0	CADR	ABS	YIELDS AVAL OF CRITERION ON DX IN MPAC
1155	REF	324	LAST	817	31,3555	52 155 1	CXCH	MPAC	
1156	REF	1			31,3556	52 125 0	CXCH	DXCRIT	CRITERION
A1157									SFT UP DER COF TABL
1158					31,3557	0 0016 1	EXTEND		
1159	REF	2	LAST	817	31,3560	5 0117 0	INDEX	PWRPTR	
1160					31,3561	3 0004 0	CCA	3	
1161	REF	325	LAST	818	31,3562	52 155 1	CXCH	MPAC	A(N) TO MPAC
1162	REF	326	LAST	818	31,3563	3 0160 0	CA	MPAC	+4 N-1 TO A
1163	REF	1			31,3564	54 140 0	DERCLCCP	TS	LCCF COUNTER
1164	REF	90	LAST	816	31,3565	6 4753 1	AD	ONE	
1165	REF	1			31,3566	2 7321 0	TC	DEFENSUR	YIELDS DERCOF = 1 X A(1) IN MPAC
1166					31,3567	0 0016 1	EXTEND		
1167	REF	3	LAST	818	31,3570	5 0117 0	INDEX	PWRPTR	
1168					31,3571	3 0002 0	CCA	1	
1169	REF	327	LAST	818	31,3572	52 155 1	CXCH	MPAC	A(I-1) TO MPAC, FETCHING DERCOF
1170	REF	2	LAST	817	31,3573	50 141 0	INDEX	DERPTR	
1171					31,3574	52 004 1	CXCH	3	DERCOF TO DER TABL
1172	REF	52	LAST	818	31,3575	4 4752 1	CS	TWO	
1173	REF	4	LAST	818	31,3576	26 117 1	ADS	PWRPTR	DECREMENT PWR POINTER
1174	REF	53	LAST	818	31,3577	4 4752 1	CS	TWO	
1175	REF	3	LAST	818	31,3600	26 141 1	ADS	DERPTR	DECREMENT DER POINTER
1176	REF	2	LAST	818	31,3601	10 140 0	CCS	PWRPTR	
1177	REF	1			31,3602	1 3564 1	TCF	DERCLCCP	
A1178									CONVERGE ON ROOT
1179					31,3603	0 0016 1	DERCLCCP	EXTEND	
1180	REF	2	LAST	817	31,3604	3 0127 0	CCA	ROOTPS	FETCH CURRENT ROOT
1181	REF	328	LAST	818	31,3605	52 155 1	CXCH	MPAC	LEAVE IN MPAC
1182					31,3606	2 7321 0	EXTEND		
1183	REF	329	LAST	818	31,3607	3 0152 1	CCA	MPAC	+5 LOAD A, L WITH DER TABL ADDRES, N-2
1184	REF	1			31,3610	0 7220 0	TC	POWRSERS	YIELDS DERIVATIVE IN MPAC
1185					31,3611	0 0016 1	EXTEND		
1186	REF	2	LAST	818	31,3612	3 0127 0	CCA	ROOTPS	
1187	REF	330	LAST	818	31,3613	52 155 1	CXCH	MPAC	CURRENT ROOT TO MPAC, FETCHING DERIVATIVE
1188	REF	75	LAST	806	31,3614	52 131 0	CXCH	BLF	LEAVE DERIVATIVE IN BLF AS DIVISOR
1189					31,3615	0 0016 1	EXTEND		
1190	REF	331	LAST	818	31,3616	3 0160 0	CCA	MPAC	+3 LOAD A, L WITH PWR TABL ADDRES, N-1
1191	REF	2	LAST	818	31,3617	0 7220 0	TC	POWRSERS	YIELDS RESIDUAL IN MPAC
1192	REF	2	LAST	818	31,3620	0 4713 0	TC	USPPCADR	

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1193	R F	1		21,3621	00353	1	CACP	DEV/PCDV	YIELCS -DX IN MPAC		
1194				21,3622	00366	1	EXTEND				
1195	RFF	332	LAST	818	31,3623	4 1155	1	DCS	MPAC	FETCH DX, LEAVING -DX IN MPAC	
1196	RFF	4	LAST	818	31,3624	20 127	1	CAS	RECTPS	CORRECTED RECT NOW IN RECTPS	
1197	RFF	4	LAST	818	31,3625	07 4713	1	TC	USPPCADP		
1198	RFF	2	LAST	818	31,3626	01226	0	CACP	ABS	YIELCS APS(DX) IN MPAC	
1199					21,3627	00376	1	EXTEND			
1200	RFF	2	LAST	818	31,3630	4 0125	1	DCS	DXCRIT		
1201	RFF	333	LAST	819	31,3631	20 155	1	CAS	MPAC	APS(DX)-APS(DXCRIT) IN MPAC	
1202	RFF	11	LAST	817	31,3632	3 0163	0	CA	MODE		
1203	RFF	23	LAST	780	31,3633	7 4751	0	MASK	BIT4		
1204	RFF	241	LAST	816	31,3634	10 0100	0	CCS	A	KLUMPF SAYS GIVE UP AFTER EIGHT PASSES	
1205	RFF	2	LAST	817	31,3635	10 112	1	HADPCCT	TC	RETRCCT	
1206	RFF	12	LAST	819	31,3636	24 163	0	INCR	MODE	INCREMENT ITERATION COUNTER	
1207	RFF	234	LAST	819	31,3637	10 154	0	CCS	MPAC	TEST FI CRDEP DX	
1208	RFF	1			31,3640	1 3613	0	TCF	RECTLCOP		
1209	RFF	1			31,3641	1 3643	1	TCF	TESTLCDX		
1210	RFF	1			31,3642	1 3647	0	TCF	RECTSTOR		
1211	RFF	335	LAST	819	31,3643	10 155	1	TESTLCDX	CCS	MPAC	+1 TEST LC CRDEP DX
1212	RFF	2	LAST	819	31,3644	1 3613	0	TCF	RECTLCOP		
1213	RFF	2	LAST	819	31,3645	1 3647	0	TCF	RECTSTOR		
1214	RFF	3	LAST	819	31,3646	1 3647	0	TCF	RECTSTOR		
1215	RFF	5	LAST	819	31,3647	52 127	1	RECTSTOR	EXCH	RECTPS	
1216	RFF	336	LAST	819	31,3648	52 155	1	EXCH	MPAC		
1217	RFF	13	LAST	819	31,3651	3 0163	0	CA	MODE		
1218	RFF	227	LAST	819	31,3652	54 156	1	TS	MPAC	+2 STORE SP ITERATION COUNT IN MPAC+2	
1219	RFF	3	LAST	819	31,3653	5 132	1	INDEX	RETRCCT		
1220					31,3654	1 0112	1	TCF	2		
1221	RFF	1			31,3655	00147	0	DEPTABLL	ACRES	DEPCCFN	-3

R1222 *****
 R1224 TRASHY LITTLE SUBROUTINE
 R1225 *****

1227	RFF	13	LAST	804	31,3656	51 346	1	INTERPRETX	INDEX	WCHPHASE	SET X1 ON THE WAY TO THE INTERPRETER
1228	RFF	2	LAST	804	31,3657	4 240	0	CS	TARGETEX		
1229	RFF	24	LAST	802	31,3660	51 121	1	INDEX	FIXLCC		
1230	RFF	22	LAST	771	31,3661	54 140	1	TS	X1		
1231	RFF	134	LAST	812	31,3662	1 6042	0	TCF	INTERPT		

1232	R F	17	LAST	804	31,3663	3 1642	0	TCISPSET	CA	TTF/8
1233					31,3664	7 006	1	EXTEND		
1234	RFF	1			31,3665	7 475	1	MP	TSCALIN	

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1235	REF	4	LAST	316	31,3666	52'476 1	EXCH	TTFDISP	
1236	REF	9	LAST	806	31,3667	3 5114 1	CA	EBANK5	TREDES BECOMES ZFRC TWO PASSES
1237	REF	31	LAST	806	31,3670	54 003 0	TS	EBANK	BEFORE TCCFAPPR IS REACHED
1238	REF	2	LAST	122	55,1470		EBANK=	TCCFAPPR	
1239	REF	3	LAST	820	31,3671	3 1471 0	CA	TCCFAPPR	
1240	REF	21	LAST	807	31,3672	24 006 1	INCR	EBANK	
1241	REF	22	LAST	820	31,3672	24 006 1	INCR	BBANK	
1242	REF	18	LAST	819	57,1642		EBANK=	TTF/3	
1243	REF	19	LAST	820	31,3674	6 1642 0	AD	TTF/8	
1244					31,3675	0 006 1	EXTEND		
1245	REF	1			31,3676	7 3731 0	MF	TREDESCL	
1246	REF	1			31,3677	6 3726 1	AD	-DEC103	
1247	REF	3	LAST	600	31,3710	6 4735 1	AD	NEGMAX	
1248	REF	125	LAST	815	31,3711	54 001 1	TS	L	
1249	REF	126	LAST	820	31,3712	4 001 1	CS	L	
1250	REF	127	LAST	820	31,3713	6 001 0	AD	L	
1251	REF	1			31,3714	6 3720 0	AD	+DEC99	
1252	REF	21	LAST	816	31,3715	6 4733 1	AD	PCSMAX	
1253	REF	4	LAST	808	31,3716	55'666 1	TS	TREDES	
1254	REF	5	LAST	820	31,3717	4 1666 1	CS	TREDES	
1255	REF	5	LAST	820	31,3710	27'666 1	ADS	TREDES	
1256	REF	206	LAST	807	31,3711	0 0012 0	TC	G	
1257	REF	3	LAST	448	31,3712	0 5642 1	1406PCD	TC	PCDQCF
1258					31,3713	21406 1	QCT	21406	
1259	REF	33	LAST	807	31,3714	0 5567 0	1406ALM	TC	ALARM
1260					31,3715	01406 1	QCT	01406	
1261	REF	2	LAST	807	31,3716	1 3422 1	TCF	RATESTOP	

R1262 *****
 R1264 SPECIALIZED "PHASCHAG" SUBROUTINE
 R1265 *****

1267	REF	1			53,1440		EBANK=	PHSNAME2	
1268	REF	2	LAST	224	31,3717	3 5007 0	FASTCHG	CA	EBANK3
1269	REF	32	LAST	820	31,3720	56 003 1	EXCH	EBANK	SPECIALIZED 'PHASCHAG' ROUTINE
1270	REF	128	LAST	820	31,3721	52 002 1	EXCH	L	
1271	REF	1			31,3722	55'442 0	TS	PHSNAME3	
1272	REF	33	LAST	820	31,3723	22 003 1	EXCH	EBANK	
1273	REF	3	LAST	791	57,1621		EBANK=	F2LPS	
1274	REF	242	LAST	819	31,3724	0 0000 1	TC	A	

R1275 *****
 R1277 PARAMETER TABLE INDIRECT ADDRESSES
 R1278 *****

1280	REF	2	LAST	122	55,1402		RDG	=	PPRFG
1281	REF	2	LAST	122	55,1410		VCG	=	VERFG

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1282	RFF	2	LAST	122	F5,1416	AFG	=	ABPFC
1283	RFF	2	LAST	122	F5,1424	VGC2TTF	=	VBFFC*
1284	RFF	2	LAST	122	F5,1426	AGC2TTF	=	ABFFG*
1285	RFF	2	LAST	122	F5,1431	JGC2TTF	=	JBFFG*

P1286 *****

P1288 LUNAR LANDING CONSTANTS

P1289 *****

1291	RFF	7	LAST	R01	31,3726	01665 0	TARLTTFI	ADRES	TARLTTF	+3	ADDRESS FOR REFERENCING TTF TABLE
------	-----	---	------	-----	---------	---------	----------	-------	---------	----	-----------------------------------

1292	RFF	29	LAST	P15	474		TTFSCALE	=	BIT12
------	-----	----	------	-----	-----	--	----------	---	-------

1293	RFF	34	LAST	E15	4750		TSCALEIN	=	BIT4
------	-----	----	------	-----	------	--	----------	---	------

1294					31,3726	77630 1	-DEC103	DEC	-1 3
------	--	--	--	--	---------	---------	---------	-----	------

1295					31,3727	00155 0	P64DE	CCT	00155	0.3 DEGREES SCALED AT CCL SCALING
------	--	--	--	--	---------	---------	-------	-----	-------	-----------------------------------

1296					31,3727	00143 1	+DEC099	DEC	+90
------	--	--	--	--	---------	---------	---------	-----	-----

1297					31,3731	75340 1	TREDSCL	DEC	-0.18
------	--	--	--	--	---------	---------	---------	-----	-------

1298					31,3732	00264 1	180DEGS	DEC	+180
------	--	--	--	--	---------	---------	---------	-----	------

1299					31,3733	00256 1	1/2DEC	DEC	+0.0278
------	--	--	--	--	---------	---------	--------	-----	---------

1300					31,3734	01542 0	PROJMAX	DEC	0.42262 B-3	SIN(25.1)/8 TO COMPARE WITH PROJ
------	--	--	--	--	---------	---------	---------	-----	-------------	----------------------------------

1301					31,3735	01222 0	PROJMIN	DEC	0.25882 B-3	SIN(15.1)/8 TO COMPARE WITH PROJ
------	--	--	--	--	---------	---------	---------	-----	-------------	----------------------------------

1302					31,3736	01477 1	V06A53	VA	0663	P63
------	--	--	--	--	---------	---------	--------	----	------	-----

1303					31,3737	01511 0	V06A64	VA	0664	P64
------	--	--	--	--	---------	---------	--------	----	------	-----

1304					31,3740	01474 1	V06A60	VA	0660	P65, P66, P67
------	--	--	--	--	---------	---------	--------	----	------	---------------

1305					22,3647		BANK	22		
1306	RFF	1			22,3647		SETLCC	LANDCAST		

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1317	22,3647	BANK	
1318	PFF 1	CCOUNT#	54/520PS
1309	22,3647	00021 1	HIGHEST 2DFC 4.24546769 E-12
1309	22,3650	14161 1	
1310	22,3651	01441 0	GSCALE 2DEC 100 B-11
1310	22,3652	00000 1	
1311	22,3653	14000 1	3/8DP 2DFC .375
1311	22,3654	01111 1	
1312	22,3655	20000 1	3/4DP 2DFC .750
1312	22,3656	01110 1	
1313	22,3657	77534 0	CFPRCRIT 2DFC -.02 E-1
1313	22,3660	45074 0	
P1314	*****		
P1316	*****		

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0001				21,2006			BANK 21		
0002	REF	1		21,2007			SETLCC R11		
0003				21,2006			BANK		
0004	REF	32	LAST	810	07,1915		FBANK= DVCNTR		
0005	REF	1					COUNT# 18/R11		
0006	REF	17	LAST	755	21,2006	4 0103 1	R10,R11	CS	FLAGWRD7
0007	REF	4	LAST	704	21,2007	7 4747 0		MASK	AVGFEIT
0008	REF	243	LAST	820	21,2010	10 000 0		CCS	A
0009	REF	57	LAST	815	21,2011	1 5261 0		TCF	TASKOVER
0010	REF	3	LAST	607	21,2012	11 055 1		CCS	PIPCTR
0011					21,2013	1 2015 0		TCF	+2
0012	REF	1			21,2014	1 2125 1		TCF	LPHTASK
0013	REF	1			21,2015	55 714 0	+2	TS	PIPCTR1
0014	REF	2	LAST	152	07,1714		PIPCTR1	=	LACQSAVE
0015	REF	3	LAST	508	1055		PIPCTR	=	PHSPRCT2
0016	REF	3	LAST	438	21,2016	3 0110 0		CAF	OC731
0017	REF	23	LAST	914	21,2017	0 5173 1		TC	TWIDDLE
0018	REF	2	LAST	240	21,2020	0 2004 0		ADRES	R1,R11
0019	REF	3	LAST	615	21,2021	3 4753 1	R10,R11	CAF	VFLSHBIT
0020	REF	7	LAST	615	21,2022	7 0107 0	FLASHF?	MASK	FLCWRD11
0021					21,2023	0 0006 1		EXTEND	
0022	REF	1			21,2024	1 2030 1		BZF	FLASHV?
									H FLASH OFF, SO LEAVE ALONE
0023	REF	2	LAST	615	21,2025	3 4747 1		CA	HLITE
0024	REF	129	LAST	820	21,2026	54 001 1		TS	L
0025	REF	1			21,2027	0 4606 0		TC	FLIP
									FLIP HLITE
0026	REF	1			21,2030	3 4752 0	FLASHV?	CA	VFLSHBIT
0027	REF	8	LAST	823	21,2031	7 0107 0		MASK	FLCWRD11
0028					21,2032	0 0006 1		EXTEND	
0029	REF	1			21,2033	1 2027 0		BZF	10,11
									V FLASH OFF
0030	REF	2	LAST	615	21,2034	3 4751 0		CA	VLITE
0031	REF	12	LAST	822	21,2035	54 001 1		TS	L
0032	REF	2	LAST	823	21,2036	0 4606 0		TC	FLIP
									FLIP VLITE
0033	REF	2	LAST	731	21,2037	3 0105 0	10,11	CA	FLAGWRD?
0034	REF	2	LAST	731	21,2040	7 4742 1		MASK	LTABRIT
0035					21,2041	0 0006 1		EXTEND	
0036	REF	1			21,2042	1 2145 1		BZF	LANDISP
									NO. PROCEED TO R10.
0037	REF	14	LAST	794	21,2043	4 1100 0	P71NCW?	CS	MCDREF
0038	REF	1			21,2044	6 2104 0		AD	10FC71
0039					21,2045	0 0006 1		EXTEND	
0040	REF	2	LAST	923	21,2046	1 2145 1		BZF	LANDISP
									YES. PROCEED TO R10.

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0041				21,2047	C 00 6 1		EXTEND		NO. IS AN ABORT STAGE COMMAND?
0042	RFF	6	LAST	793	21,2050	00 033 1	READ	CHAM2C	
0043					21,2051	4 00 0 1	CCM		
0044	RFF	121	LAST	823	21,2052	54 001 1	TS	L	
0045	RFF	35	LAST	821	21,2053	7 4750 0	MASK	BIT4	
0046	RFF	244	LAST	822	21,2054	10 000 0	CCS	A	
0047	RFF	2	LAST	242	21,2055	1 2073 0	TCF	P71A	YES.
0048	RFF	15	LAST	823	21,2056	4 1011 0	P70NOW?	CS	MCDREG
0049	RFF	1			21,2057	6 2103 1	AD	100070	NO. ARE WE IN P7C NOW?
0050					21,2060	0 0006 1	EXTEND		
0051	RFF	3	LAST	823	21,2061	1 2145 1	BZF	LANDISP	YES. PROCEED TO R10.
0052	RFF	132	LAST	824	21,2062	3 0001 0	CA	L	NO. IS AN ABORT COMMAND?
0053	RFF	39	LAST	816	21,2063	7 4753 0	MASK	BIT1	
0054	RFF	245	LAST	824	21,2064	10 000 0	CCS	A	
0055	RFF	2	LAST	242	21,2065	1 2070 0	TCF	P70A	YES.
0056	RFF	4	LAST	824	21,2066	1 2145 1	TCF	LANDISP	NO. PROCEED TO R10.
0057	RFF	1					CCOUNT*	\$\$/P71	
0058	RFF	1			21,2067	1 2105 1	P70	TC	LEGAL?
0059	RFF	155	LAST	817	21,2070	4 4755 0	P70A	CS	Z750
0060					21,2071	1 2074 1	TCF	+3	
0061	RFF	2	LAST	824	21,2072	0 2105 1	P71	TC	LEGAL?
0062	RFF	54	LAST	818	21,2073	3 4752 0	P71A	CAF	TWC
0063	RFF	207	LAST	820	21,2074	54 002 1	+3	TS	G
0064					21,2075	0 0014 0	INHINT		
0065					21,2076	0 0006 1	EXTEND		
0066	RFF	1			21,2077	3 2102 0	DCA	CNTABTAD	
0067					21,2100	52 0006 0	ETCP		
0068	RFF	32	LAST	823	05,2115		ERANK=	DVCNTP	
0069	RFF	1			21,2111	03400 0	CNTAETAC	ZCAEP	CNTABRT
0069	RFF	1			21,2112	12067 0			
0070					21,2113	00106 0	1DEC7C	DEC	70
0071					21,2114	00107 1	1DEC71	DEC	71
0072					05,2400		RANK	05	
0073	RFF	1			05,2401		SETLCC	ABORTS1	
0074					05,2402		RANK		
0075	RFF	1					CCOUNT*	\$\$/P70	
0076	RFF	1			05,2411	3 3413 0	CNTAERT	CAF	ABRTJADR
0077	RFF	1			05,2411	54 017 0	TS	RRLPT	
0078					05,2412	5 0017 1	RESUME		
0079	RFF	1			05,2413	1 3414 0	ABRTJADR	TCF	ABRTJASK
0080	RFF	1			05,2414	2 3414 1	ABRTJASK	CAF	CNTAL27

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0001	REF	208	LAST	P24	05,3405	6 0002 1	AD	G	
0002	REF	132	LAST	P24	05,3406	54 001 1	TS	L	
0003	REF	1			05,3407	4 0000 0	CCM		
0004	REF	6	LAST	740	05,3410	52 760 1	EXCH	-PHASE4	
0005	REF	219	LAST	P25	05,3411	50 002 0	INDEX	G	
0006	REF	1			05,3412	2 3463 0	CAF	MCLETC	
0007	REF	16	LAST	P24	05,3412	55 0110 0	TS	MCPREC	
0008	REF	24	LAST	750	05,3414	55 1162 1	TS	DISPDEX	INSURE DISPDEX IS POSITIVE.
0009	REF	210	LAST	P25	05,3415	10 002 1	CCS	G	SET APSFLAC IF P71.
0010	REF	16	LAST	750	05,3416	4 0106 1	CS	FLAGWPD1	SET APSFLAC PRIOR TO THE ENEMA.
0011	REF	11	LAST	750	05,3417	7 4727 1	MASK	APSFLRIT	
0012	REF	17	LAST	P25	05,3421	26 106 1	ADS	FLAGWPD1	
0013	REF	1			05,3421	4 2466 1	CS	DAPRITS	DAPRITS = CCT 40640 = EITS 6,8,9,15
0014	REF	23	LAST	753	05,3422	7 0111 1	MASK	DAPRCLS	RESET ULLAGE, DRIFT, XOVERINH, AND PULSES
0015	REF	24	LAST	P25	05,3422	54 111 1	TS	DAPRCLS	
0016	REF	1			05,3424	2 2467 1	CAF	LDGDP	INSURE DAP READPAND IS SET TO 1 DEG/SEC
0017	REF	2	LAST	756	05,3425	55 2443 0	TS	LE	
0018	REF	25	LAST	702	05,3426	4 0101 0	CS	FLAGWRD5	SET ENGONFLG.
0019	REF	5	LAST	752	05,3427	7 4745 1	MASK	ENGONBIT	
0020	REF	26	LAST	P25	05,3430	26 101 0	ADS	FLAGWRD5	
0101	REF	8	LAST	753	05,3431	4 4355 1	CS	PRIC30	INSURE THAT THE ENGINE IS ON, IF ARMED.
0102	REF	1			05,3432	0 0006 1	EXTEND		
0103	REF	26	LAST	752	05,3433	02 011 0	RAND	OSALMOUT	
0104	REF	24	LAST	815	05,3434	6 4737 0	AD	BIT13	
0105	REF	1			05,3435	0 0006 1	EXTEND		
0106	REF	27	LAST	P25	05,3436	01 111 0	WRITE	OSALMOUT	
0107	REF	4	LAST	557	05,3437	3 4735 1	CAF	LDGYPIT	TERMINATE R12.
0108	REF	8	LAST	922	05,3440	54 117 0	TS	FLAGWPD1	
0109	REF	23	LAST	595	05,3441	4 0274 0	CS	FLAGWRD0	SET R10FLAC TO SUPPRESS OUTPUTS TO THE
0110	REF	1			05,3442	7 4752 1	MASK	FLDLEBIT	CROSS-FOINTER DISPLAY.
0111	REF	24	LAST	P25	05,3443	26 074 0	ADS	FLAGWRD0	THE FOLLOWING ENEMA WILL REMOVE THE
0112									DISPLAY INERTIAL DATA OUTPUT.
0113					05,3444	0 0006 1	EXTEND		LOAD TEVENT FOR THE DOWNLINK.
0114	REF	25	LAST	811	05,3445	3 0025 0	CCA	TIME2	
0115	REF	6	LAST	752	05,3446	53 242 1	EXCH	TEVENT	
0116					05,3447	0 0006 1	EXTEND		
0117	REF	1			05,3450	3 3462 1	CCA	SVFXITAC	
0118	REF	2	LAST	732	05,3451	52 1252 1	EXCH	AVGEXIT	
0119	REF	1			05,3452	0 2653 0	TC	APTKLEAN	KILL GROUPS 1,2, AND 6.

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0120	REF	24	LAST	728	05,3453	3 6250 0	CAF	THREE	SFT UP 4.3SFCT FOR CCAECRT
0121	REF	134	LAST	828	05,3454	54 071 1	TS	L	
0122					05,3455	4 0000 0	CCM		
0123	REF	7	LAST	828	05,3456	52 760 1	DXCH	-PHASE4	
0124	REF	48	LAST	810	05,3457	0 4635 0	TC	POSTJUMP	
0125	REF	1			05,3458	12763 0	CADR	ENFMA	
0126	REF	34	LAST	824	07,1515		EBANK=	DVCNTR	
0127	REF	6	LAST	758	05,3461	03761 1	SVEXITAD	2CADR	SFVEXIT
0127					05,3462	64067 1			
0128					05,3463	00116 1	MODF70	DEC	70
0129					05,3464	00127 1	MODF71	DEC	27
0130					05,3465	00117 1	MODF71	DEC	71
0131					05,3466	43540 1	CAPEITS	OCT	40640
0132					05,3467	00554 0	1DEGDE	OCT	00554
0133					32,3547		EANK	32	
0134	REF	1			32,3548		SFTLCC	APCPTS	
0135					32,3547		BANK		
0136	REF	1					COUNT#	\$\$/P7C	
0137	REF	15	LAST	826	32,3547	3 4751 0	GCABERT	CAF	FCUR
0138	REF	25	LAST	826	32,3550	551515 0		TS	DVCNTR
0139	REF	1			32,3551	3 3756 0	CAF	WHICHADR	
0140	REF	27	LAST	778	32,3552	551455 0	TS	WHICH	
0141	REF	135	LAST	819	32,3553	0 6142 1	TC	INTPRET	
0142					32,3554	43114 0	CLFAR	CLLAR	
0143	REF	1			32,3555	04665 0		FLRCS	
0144	REF	4	LAST	739	32,3556	04265 1		FLUNDISP	
0145					32,3557	43014 0	CLEAR	SFT	
0146	REF	5	LAST	758	32,3558	02670 0		IDLEFLAG	
0147	REF	1			32,3561	06464 1		ACC4-2FL	
0148					32,3562	45014 0	SFT	CALL	
0149	REF	1			32,3563	04462 0		P71FIELD	
0150	REF	2	LAST	736	32,3564	61071 0		INITCDUW	
0151					32,3565	77776 1	EXIT		
0152	REF	6	LAST	814	32,3566	0321 1	TC	CPACKMM	
0153					32,3567	00116 0	70DEC	DEC	70
0154	REF	1			32,3570	1 27 2 0	TCF	P71REF	
0155	REF	136	LAST	826	32,3571	0 6142 1	P71INIT	TC	INTPRET
0156					32,3572	77624 1		CALL	
0157	REF	1			32,3573	05721 1		TGDCOMP	
0158					32,3574	54345 1	ELCAD	SL	

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0150	REF	1		22,2575	34,230		MODTDP	
0160				32,2576	21205	1	40	
0161				32,2577	77665	1	BDDV	
0162	REF	11	LAST	813	32,2610	01244	1	MASS
0163	REF	2	LAST	120	32,2611	16271	1	STOCL
0164	REF	11	LAST	827	32,2612	01244	1	TRUP
0165				32,2613	70471	1	MASS	
0166	REF	1		32,2614	16115	1	CDV	SP1
0167	REF	2	LAST	153	32,2615	03635	1	K(1/CDV)
0168	REF	2	LAST	153	32,2616	03637	0	STORE
0169	REF	2	LAST	153	32,2617	03641	1	1/CDV1
0170				32,2618	77665	1	STORE	1/CDV2
0171	REF	1		32,2619	25755	1	STORE	1/CDV3
0172	REF	2	LAST	21	32,2620	16262	1	BDDV
0173	REF	1		32,2621	34015	1		
0174	REF	2	LAST	120	32,2622	02267	0	K(AT)
0175				32,2623	57535	0	AT	
0176	REF	2	LAST	747	32,2624	26112	1	100PCT10
0177				32,2625	77721	1	STORE	TTC
0178	REF	2	LAST	120	32,2626	36265	0	SLOAD
0179	REF	1		32,2627	60275	1	SP2	DCCMP
0180				32,2628	77745	1	DPSVFX	
0181	REF	2	LAST	122	32,2629	02567	1	STCALL
0182	REF	3	LAST	217	32,2630	36273	1	VE
0183	REF	1		32,2631	57512	0	CCMINIT	
0184				32,2632	45266	0	INJTAG	
0185	REF	2	LAST	122	32,2633	02565	0	CLCAT
0186				32,2634	45266	0	APTPDET	
0187	REF	1		32,2635	02565	0	STCALL	RDCTC
0188	REF	2	LAST	121	32,2636	02565	0	YCCMP
0189	REF	2	LAST	153	32,2637	02565	0	DSU
0190				32,2638	02565	0	ABS	YLIM
0191	REF	3	LAST	827	32,2639	02565	0	BMN
0192	REF	2	LAST	153	32,2640	02565	0	SIGN
0193				32,2641	02565	0	YCK	
0194	REF	2	LAST	121	32,2642	02565	0	Y
0195	REF	2	LAST	153	32,2643	02565	0	STORE
0196				32,2644	02565	0	YCD	
0197	REF	3	LAST	827	32,2645	02565	0	ELC
0198	REF	2	LAST	153	32,2646	02565	0	LSL
0199				32,2647	02565	0	YCC	
0200	REF	3	LAST	827	32,2648	02565	0	Y
0201				32,2649	02565	0	SP	
0202	REF	3	LAST	217	32,2650	02565	0	SD
0203				32,2651	02565	0	50	
0204	REF	1		32,2652	02565	0	STORE	XRANGE
0205	REF	1		32,2653	02565	0	SFT	CALL
0206	REF	1		32,2654	02565	0	FLVR	
0207	REF	1		32,2655	02565	0	THFTCMP	
0208	REF	2	LAST	122	32,2656	02565	0	RPL
0209				32,2657	02565	0	THFTCMP	
0210	REF	2	LAST	123	32,2658	02565	0	+4
0211				32,2659	02565	0	VLOAD	GCTC
0212	REF	2	LAST	123	32,2660	02565	0	J1PARM
0213				32,2661	02565	0	+3	
0214	REF	2	LAST	123	32,2662	02565	0	+4
0215	REF	2	LAST	123	32,2663	02565	0	VLOAD
0216	REF	2	LAST	123	32,2664	02565	0	J2PARM
0217	REF	2	LAST	123	32,2665	02565	0	+3
0218	REF	2	LAST	153	32,2666	02565	0	STOCL
0219				32,2667	02565	0	JPARM	
0220				32,2668	02565	0	RCC	

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0209	REF	1		32,3657	72425	1	STORE	RP
0210				32,3658	77414	0	SFT	FXIT
0211	REF	1		32,3661	04471	1		PCTFLAG

0212	REF	1		32,3662	03741	1	UPTRCT	TC	TRFOTLP
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0213	REF	55	LAST	810	32,3663	05353	1	TC	PHASCHNG
0214					32,3664	04024	0	CCT	04024

0215	REF	54	LAST	818	32,3665	05514	0	TC	UPFLAG
0216	REF	1			32,3666	00216	1	APRES	FLAP

0217	REF	278	LAST	814	32,3667	04616	1	LPTRCT1	TC	BANKCALL	VERIFY THAT THE PANEL SWITCHES ARE PROPERLY SET.
0218	REF	2	LAST	725	32,3670	73707	0	CACF	P40AUTO		

0219	REF	2	LAST	828	32,3671	03740	1	TC	THRCTL
------	-----	---	------	-----	---------	-------	---	----	--------

0220	REF	4	LAST	739	32,3672	35027	1	CACF	PR1017	LET SERVICER FINISH BEFORE CONNECTING ASCENT GUIDANCE EQUATIONS.
0221	REF	15	LAST	797	32,3673	05146	1	TC	PR1000	

0222					32,3674	00006	1	EXTEND	
------	--	--	--	--	---------	-------	---	--------	--

0223	REF	1			32,3675	33760	0	CCA	ATMACAD
------	-----	---	--	--	---------	-------	---	-----	---------

0224	REF	4	LAST	825	32,3676	53252	1	EXCH	AVGEXIT
------	-----	---	------	-----	---------	-------	---	------	---------

0225	REF	61	LAST	828	32,3677	05353	1	APP40FF	TC	PHASCHNG	TERMINATE USE OF GROUP 4.
0226					32,3678	01114	0	CCT	01114		

0227	REF	130	LAST	810	32,3701	15155	1	TCF	ENDOFJCB
------	-----	-----	------	-----	---------	-------	---	-----	----------

0228	REF	86	LAST	818	32,3702	15516	0	P71RFT	TC	DOWNFLAG
------	-----	----	------	-----	---------	-------	---	--------	----	----------

0229	REF	2	LAST	784	32,3703	00215	1	APRES	LFTABCT
------	-----	---	------	-----	---------	-------	---	-------	---------

0230	REF	2	LAST	751	32,3704	36000	1	CACF	THRESH2	SET DOWN THRESHOLD TO THE ASCENT VALUE.
0231	REF	5	LAST	778	32,3705	55250	0	TS	OVTHRESH	

0232	REF	127	LAST	826	32,3706	06042	1	TC	INTPRFT
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0233					32,3707	77624	1	CALL	
------	--	--	--	--	---------	-------	---	------	--

0234	REF	1			32,3710	67251	1		P121MIT
------	-----	---	--	--	---------	-------	---	--	---------

0235					32,3711	45714	0	BCN	CALL
------	--	--	--	--	---------	-------	---	-----	------

0236	REF	2	LAST	828	32,3712	04707	0		FLAP
------	-----	---	------	-----	---------	-------	---	--	------

0237	REF	1			32,3712	65717	0		CLETIME
------	-----	---	--	--	---------	-------	---	--	---------

0238	REF	2	LAST	826	32,3714	65731	1		TGCCOMP	IF FLAP=0, TCC=T-TIG
0239					32,3715	77650	1	GOTC		

0240	REF	1			32,3716	65622	1		TJ1TARG
------	-----	---	--	--	---------	-------	---	--	---------

0241					32,3717	72545	0	CLETIME	ELGAD	IF FLAP=1, TGC=2 TGC
0242	REF	15	LAST	708	32,3720	02517	1		TCC	

0243	REF	1			32,3721	02502	0	STORE	TGC1
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0244					32,3722	77775	1	EXIT	
------	--	--	--	--	---------	-------	---	------	--

0245	REF	61	LAST	828	32,3723	05353	1	TC	PHASCHNG
------	-----	----	------	-----	---------	-------	---	----	----------

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0246				32,3724	34,124		EOT	04,124
0247				32,3725	0 0006 1		EXTEND	
0248	REF	2	LAST	82P	32,3726	3 15 12 1	OCA	TGC1
0249	REF	16	LAST	82E	32,3727	53 517 1	EXCH	TCC
0250	REF	1			32,3728	1 2667 1	TCF	UPHRACT1

0251	REF	9	LAST	75	57,15 1		TCC1	=	VCHDDY
0252	*****								

0253					21,2115		BANK	21
0254	REF	2	LAST	922	21,2116		SETLCC	P11
0255					21,21 5		BANK	

0256	REF	2	LAST	824 TC	024:	14	14*	COUNT#	\$\$/P70
------	-----	---	------	--------	------	----	-----	--------	----------

0257	REF	11	LAST	232	21,2115	4 1774 1	LEGAL?	CS	MMNUMBER	IS THE DESIRED PGM ALREADY IN PROGRESS?
0258	REF	17	LAST	825	21,2116	6 1110 1		AD	MCDPEG	
0259					21,2117	0 0006 1		EXTEND		
0260	REF	1			21,2118	1 2121 0		BZF	ABORTALM	

0261	REF	4	LAST	823	21,2111	4 0115 1		CS	FLAGWED9	ARE THE /BCRTS ENABLED?
0262	REF	3	LAST	823	21,2112	7 4743 1		MASK	LETARLIT	
0263	REF	246	LAST	824	21,2113	10 0000 0		CCS	A	
0264	REF	2	LAST	820	21,2114	1 2121 0		TCF	ABORTALM	

0265	REF	18	LAST	823	21,2115	3 0113 0		CA	FLAGWED7	IS SERVICE ON THE AIR?
0266	REF	5	LAST	823	21,2116	7 4747 0		MASK	AVEGFR11	
0267	REF	247	LAST	820	21,2117	10 0000 0		CCS	A	
0268	REF	211	LAST	825	21,2121	0 0002 0		TC	G	YES. ALL IS WELL.

0269	REF	7	LAST	459	21,2121	0 4364 1	ABORTALM	TC	FALTEN	
0270	REF	10	LAST	450	21,2122	0 4457 0		TC	RELESP	
0271	REF	46	LAST	826	21,2123	0 4635 0		TC	POSTJUMP	
0272	REF	5	LAST	452	21,2124	21 151 0		CADR	PINBRNCH	

0273					32,3731		BANK	32
0274	REF	2	LAST	826	32,3732		SFTLCC	AECRTS
0275					32,3731		BANK	

0276	REF	2	LAST	826 TC	825:	114	114*	CCLNT#	\$\$/P71
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0277	*****								
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0278					32,3731	45234 0	TCCCCVF	RTE	ESU
0279	REF	22	LAST	715	32,3732	21574 1			LCADTIME
0280	REF	34	LAST	781	32,3733	03442 0			TIC
0281					32,3734	77661 1		SL	
0282					32,3735	20214 1			110
0283	REF	17	LAST	829	32,3736	03517 1		STORE	TCC
0284					32,3737	77616 0		PVC	

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R02F5 *****

0286	REF	25	LAST	825	32,3740	2 4737 0	THROTLR	CAF	BIT13
0287	REF	5	LAST	788	32,3741	54 155 0		TS	THRUST
0288	REF	26	LAST	824	32,3742	3 4750 1		CAF	PIT4
0289					32,3743	2 10016 1		EXTEND	
0290	REF	11	LAST	788	32,3744	05 014 1		WOR	CHAN14
0291	REF	212	LAST	825	32,3745	0 00 2 0		TC	0

R0292 *****

0293					32,3746	00000 1	10SFCS	2DEC	1000
0293					32,3747	01757 1			
0294					32,375	00121 1	FINJECT	2DEC	18288 B-24
0294					32,3751	33400 0			60,000 FEET EXPRESSED IN METERS.
0295					32,3752	11021 1	(TGC)A	2DEC	37000 B-17
0295					32,3753	00000 1			
0296					32,3754	00507 0	K(AT)	2DEC	.02
0296					32,3755	25605 0			SCALING CONSTANT
0297	REF	1			32,3756	02114 1	WHICHADR	REMAADR	ABRTABLE

R0298 *****

0299	REF	36	LAST	826	37,1515			EBANK=	DVCNTR
0300	REF	2	LAST	741	32,3757	03972 1	ATNAGAD	204DF	ATMAC
0300					32,376	70067 1			

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0011 24,2677
 0012 REF 1 30,2000
 0013 31,2061

BANK 24
 SETLOC P12
 BANK

0014 REF 27 LAST 830 57,1515
 0015 REF 1

EBANK= CVCNTR
 COUNT# 44/P12

0016 REF 62 LAST 828 31,2 61 0 5353 1 P12LM
 0017 31,2 62 04 24

TC PHASCHNG
 CCT 04 24

0018 REF 225 LAST 828 31,2063 0 4616 1
 0019 REF 9 LAST 778 31,2 64 11236 0

TC BANKCALL
 CACR R12BOTH

CHECK THE STATUS OF THE IMU.

0011 REF 10 LAST 545 31,2065 0 6111 1

TC CLRADMD

INITIALIZE PARAMS FOR R29.

0011 REF 2 LAST 828 31,2 64 3 6111 1
 0012 REF 4 LAST 828 31,2 67 55125 0
 0013 REF 16 LAST 826 31,2070 3 4751 0
 0014 REF 38 LAST 821 31,2 71 551515 0

CAF TRFESH2
 TS DVTRFLSH
 CAF FOUTP
 TS DVCNTR

INITIALIZE CVMAN

0015 REF 156 LAST 824 31,2072 2 4755 1
 0016 REF 10 LAST 752 31,2073 551452 1

CA ZERR
 TS TRKMKCNT

SHOW THAT R29 DOWNLINK DATA IS NOT READY

0017 REF 1 31,2 74 2 3122 1
 0018 REF 231 LAST 831 31,2075 0 4616 1
 0019 REF 22 LAST 784 31,2 76 20477 1
 0020 REF 31 LAST 818 31,2077 1 6111 1

CAF V06A33A
 TC BANKCALL
 CACR GCFLASH
 TCF GCTOPCCH

FLASH TIG

0021 31,2100 1 2102 1
 0022 31,2101 1 2074 1

TCF +2
 TCF -5

PROCEED
 ENTER

0023 REF 63 LAST 831 31,2102 0 5353 1
 0024 31,2103 04 24 0

TC PHASCHNG
 CCT 04 24

0025 REF 120 LAST 828 31,2104 0 6142 1
 0026 31,2105 43014 0
 0027 REF 5 LAST 778 31,2106 03067 0

TC INTPPET
 SET
 MUNFLAG

0028 REF 2 LAST 828 31,2107 06464 1
 0029 31,2110 43014 0
 0030 REF 1 31,2111 0 075 0

SET
 CLEAR
 R10FLAG

0031 REF 6 LAST 778 31,2112 00270 1
 0032 31,2113 43014 0
 0033 REF 1 31,2114 04464 0

SET
 RNDVZFLG
 SET
 FLFI

0034 REF 2 LAST 827 31,2115 04461 0
 0035 31,2116 77624 1
 0036 REF 2 LAST 779 31,2117 71342 0

FLVR
 CALL
 GLIDINIT

INITIALIZE WM AND /LAND/

0037 31,2120 77624 1
 0038 REF 2 LAST 828 31,2121 6 251 1
 0039 31,2122 77745 1 P12LMB

CALL
 P12INIT
 DLEAD

0040 REF 1 31,2123 25753 1
 0041 REF 18 LAST 826 31,2124 17517 1

STCOL
 TCC

SET TCC TO AN INITIAL NOMINAL VALUE.
 TCC

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0042	PFF	3F	LAST	825	30,2125	3442 0	TIC		
0043	PFF	46	LAST	781	30,2126	3441 0	STCALL	TICCI	
0044	PFF	9	LAST	770	30,2127	2700 1		LEMPREC	POTATE THE STATE VECTORS TO THE
0045					30,2130	64375 1	VLCAD	MXV	IGNITION TIME.
0046	PFF	21	LAST	759	30,2131	0007 0		VATT	
0047	PFF	28	LAST	799	30,2132	01734 0		REFSMAT	
0048					30,2133	77772 0	VSLI		
0049	PFF	2	LAST	148	30,2134	2761 0	STCVL	VIS	COMPUTE VIS = VEL(TIG)*2(-7)M/CS.
0050	PFF	25	LAST	755	30,2135	0001 0		RATT	
0051					30,2136	52521 0	MXV	VSL6	
0052	PFF	29	LAST	832	30,2137	01734 0		REFSMAT	
0053	PFF	16	LAST	813	30,2140	37521 0	STCALL	R	COMPUTE R = PCS(TIG)*2(-24)M.
0054	PFF	3	LAST	779	30,2141	67667 1		MLNGRAV	COMPUTE GCT1/2(TIG)*2(-7)M/CS.
0055					30,2142	53575 0	VLOAD	UNIT	
0056	PFF	17	LAST	822	30,2143	03521 1		R	
0057	PFF	9	LAST	806	30,2144	37537 1	STCALL	UNIT/R/	COMPUTE UNIT/R/ FOR YCCMF.
0058	PFF	2	LAST	827	30,2145	57312 0		YCCMF	
0059					30,2146	57461 0	SP	YCCMF	
0060					30,2147	20506 0		SD	
0061	PFF	4	LAST	827	30,2150	17643 0	STCDL	XFRANCE	INITIALIZE XFRANGE FOR ACCLN 76.
0062	PFF	1			30,2151	31367 1		VINJACM	
0063	PFF	4	LAST	317	30,2152	16277 1	STCDL	ZENTP	
0064	PFF	1			30,2153	31371 0		PRCTENCM	
0065	PFF	4	LAST	827	30,2154	02273 0	STORE	PDCTD	
0066					30,2155	77776 1	EXIT		
0067	PFF	64	LAST	821	30,2156	05353 1	TC	PFASCHNC	
0068					30,2157	04024 0	OCT	04024	
0069	PFF	1			30,2160	33021 1	NEWLOAD	CAF	FLASH CROSS-RANGE AND APOLINE VALUES.
0070	PFF	241	LAST	831	30,2161	04616 1	TC	RANKCALL	
0071	PFF	23	LAST	831	30,2162	20477 1	CADR	GCFLASH	
0072	PFF	22	LAST	831	30,2163	16001 1	TCF	GCTOPCCH	
0073					30,2164	12166 0	TCF	+2	PRCCFFD
0074	PFF	1			30,2165	12160 0	TCF	NEWLOAD	ENTER NEW DATA.
0075	PFF	1			30,2166	32314 0	CAF	P12ADRES	
0076	PFF	28	LAST	826	30,2167	55455 0	TS	WHICH	
0077	PFF	65	LAST	832	30,2170	05353 1	TC	PFASCHNC	
0078					30,2171	04024 0	OCT	04024	
0079	PFF	139	LAST	831	30,2172	06042 1	TC	INTPRET	
0080					30,2173	54345 1	DLCAD	SL	
0081	PFF	5	LAST	832	30,2174	03643 0		XFRANGE	
0082					30,2175	20206 1		SD	
0083					30,2176	77615 0	PAC		
0084	PFF	4	LAST	827	30,2177	02335 0		Y	
0085	PFF	4	LAST	827	30,2200	27633 1	STCVL	YCC	
0086	PFF	10	LAST	832	30,2201	03527 0		UNIT/R/	

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0087					30,222	53361		VXSC	VAD	
0088	REF	1			30,223	21365			46FPS	
0089	REF	3	LAST	832	30,224	03601			VIS	
0090	REF	8	LAST	812	30,225	03527	1	STCRE	V	V(ITPCVFR) = V(IGN) + 57FPS (UNIT/R/)
0091					30,226	72441	0	DOT	SL1	
0092	REF	11	LAST	832	30,227	03537	0		UNIT/R/	
0093	REF	1			30,228	27474	0	STCVL	ROCT	RECT * 2(-7)
0094	REF	12	LAST	833	30,229	03537	0		UNIT/R/	
0095					30,230	52435	0	VXV	UNIT	
0096	REF	1			30,231	03721	1		QAXIS	
0097	REF	1			30,232	37726	0	STCALL	ZAXIS1	
0098	REF	1			30,233	66315	0		ASCENT	
0099					30,234	77745	1	P12DET	ELCAD	
0100	REF	2	LAST	121	30,235	02361	1		ATF	ATF(2)*2(18)
0101					30,236	65214	0	DSG	PECL	
0102	REF	2	LAST	121	30,237	02355	0		ATY	ATY(2)*2(18)
0103					30,238	43316	1	DSG	DAD	
0104					30,239	75454	0	BZF	SCRT	
0105	REF	1			30,240	61230	0		YAWDUM	
0106					30,241	55352	0	SL1	BCRV	
0107	REF	3	LAST	833	30,242	02355	0		ATY	
0108					30,243	77736	0		AFCSIN	
0109	REF	3	LAST	317	30,244	26262	0	YAWFLA	STCVL	YAW
0110	REF	15	LAST	815	30,245	02254	1		UNFC/2	
0111					30,246	50256	0	UNIT	DOT	
0112	REF	13	LAST	833	30,247	03537	0		UNIT/R/	
0113					30,248	65552	0	SL1	APCCOS	
0114					30,249	77676	0	CCCWF		
0115	REF	2	LAST	317	30,250	02365	0	STOFF	PITCH	
0116					30,251	77776	1	EXIT		
0117	REF	66	LAST	832	30,252	05353	1	TC	PH/SCFAC	
0118					30,253	04024	0	DOT	04024	
0119					30,254	05354	0	INFINT		
0120	REF	30	LAST	781	30,255	04674	0	TC	IRNKCALL	
0121	REF	3	LAST	731	30,256	40143	0	CACR	PELITEDB	
0122	REF	87	LAST	828	30,257	05516	0	TC	DOWNFLAG	
0123	REF	2	LAST	821	30,258	00213	1	ADRES	FLPT	
0124	REF	50	LAST	825	30,259	04635	0	TC	PESTJUMP	
0125	REF	3	LAST	782	30,260	74130	0	CACR	BLRNBARY	
0126					30,261	77745	1	P12INIT	ELCAD	INITIALIZE ENGINE DATA. USED FOR P12 AND F71.
0127	REF	1			30,262	16013	1		(1/0V)A	
0128	REF	3	LAST	827	30,263	02641	1	STORE	1/0V2	
0129	REF	3	LAST	827	30,264	03637	0	STORE	1/0V2	
0130	REF	3	LAST	827	30,265	17635	1	STCOL	1/0V1	
0131	REF	1			30,266	16017	0		(AT)A	
0132	REF	4	LAST	827	30,267	16263	1	STCOL	AT	
0133	REF	1			30,268	16021	0		(TRUF)A	

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0134	REF	3	LAST	827	30,2261	16271	1	STOCL	TRUP	
0135	REF	1			30,2262	34212	1		ATRECAV	
0136					30,2263	54276	0	CCOMP	SL	
0137					30,2264	20214	1		110	
0138	REF	3	LAST	827	30,2265	02267	0	STORE	TTC	
0139					30,2266	57535	0	SLOAD	DCOMP	
0140	REF	2	LAST	751	30,2267	26001	1		AFSVFX	
0141					30,2270	77702	1	SR2		
0142	REF	3	LAST	827	30,2271	02265	1	STORE	VE	
0143					30,2272	43414	1	REF	RVC	
0144	REF	3	LAST	828	30,2273	04747	1		FLAP	
0145	REF	2	LAST	827	30,2274	61275	1		CCOMINIT	
0146					30,2275	43245	1	CCOMINIT	DLAD	
0147	REF	1			30,2276	25751	0		HINJECT	
0148	REF	7	LAST	812	30,2277	02233	0		/LANE/	
0149	REF	3	LAST	827	30,2278	17631	0	STOCL	RCC	
0150	REF	8	LAST	775	30,2279	06524	1		HIGZEROS	
0151	REF	2	LAST	153	30,2280	03654	0	STORE	TXC	
0152	REF	5	LAST	832	30,2283	03633	1	STORE	YCC	
0154	REF	2	LAST	120	30,2284	26275	0	STOCL	YCCIC	
0155	REF	1			30,2285	01563	0		VRECTCSM	
0156					30,2286	64235	1	VXV	MXV	
0157	REF	5	LAST	240	30,2287	01555	1		VRECTCSM	
0158	REF	30	LAST	832	30,2288	01734	0		REFSMAT	
0159					30,2289	77556	1	UNIT		
0160	REF	2	LAST	827	30,2290	02720	1	STORE	GAXIS	
0161					30,2291	77616	0	RVC		
0162	REF	1			30,2294	02024	0	P12ACRES	REMADE	P12TABLE
0163	REF	1			34,2300			SETLCC	ASENT8	
0164					34,2303			BANK		
0165	REF	1						COUNT*	\$/P12	
0166					34,2304	47220	0	GUIDINIT	STQ	
0167	REF	6	LAST	741	34,2305	01163	1		SETPD	
0168					34,2306	00001	0		TEMP60	
0169					34,2307	41575	0		00	
0170	REF	8	LAST	775	34,2308	04516	0	VLOAD	PUSH	
0171					34,2309	41434	1		UNITZ	
0172	REF	23	LAST	829	34,2310	21574	1	PTB	PUSH	
0173					34,2311	77624	1		LOADTIME	
0174	REF	2	LAST	775	34,2312	55716	1	CALL		
0175					34,2313	74221	1		REF-TC-R	
0176	REF	21	LAST	824	34,2314	01734	0	MXV	VXSC	
0177	REF	1			34,2315	16727	0		REFSMAT	
0178	REF	4	LAST	800	34,2316	26225	1		MOONRATE	
0179	REF	8	LAST	784	34,2317	02023	1	STOCL	WM	
0180					34,2318	52445	0		PLS	
0181	REF	8	LAST	834	34,2319	26233	1	ARVAL	SLB	
								STCALL	/LAND/	

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0182	OFF	7	LAST	834	34,3363	01143	1	TEMPER	
0183					34,3364	00046	0	49FPS	2000
0183					34,3365	07374	0		
0184					34,3366	04145	0	VIAJNEN	2000
0184					34,3367	15527	0		
0185					34,3377	00007	0	RECTENOM	2000
0185					34,3371	23346	1		

EXPECTED ROCT AT TIPOVER
5509.5 FPS (APC=30NM WITH ROCT=15.5FPS)
19.5 FPS

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0001					34,3372				BANK	34
0002	REF	1			34,3373				SETLCC	ASCENT
0003					34,3372				BANK	
0004	REF	39	LAST	831	37,1515				EPANK	DVCHTR
0005	REF	1							COUNT	11/ASENT
0006	REF	67	LAST	832	34,3372	0.5353	1	ATWAC	TC	REASCENC
0007					34,3373	0.0035	1		TC	00035
0008	REF	140	LAST	832	34,3374	0.6142	1		TC	INTERPRET
0009					34,3375	77614	1		RCN	
0010	REF	2	LAST	826	34,3376	0.4705	1			ELPCS
0011	REF	2	LAST	822	34,3377	60315	0			ASCENT
0012					34,3400	45245	1		ELCAD	DSL
0013	REF	2	LAST	148	34,3401	0.3514	1			ABDVCCNV
0014	REF	1			34,3402	26203	1			MINAPCV
0015					34,3403	42040	1		BMN	CLEAR
0016	REF	1			34,3404	67756	0			ASCENT
0017	REF	15	LAST	784	34,3405	0.4267	0			SLFFLAG
0018					34,3406	67214	1		CLEAR	SLCAD
0019	REF	10	LAST	612	34,3407	0.2576	1			RENEWFLG
0020	REF	1			34,3410	31446	0			PIT3F
0021					34,3411	77471	0		EDV	EXIT
0022	REF	3	LAST	836	34,3412	0.3514	1			ABDVCCNV
0023	REF	338	LAST	819	34,3413	52.155	1		EXCH	MEAC
0024	REF	4	LAST	833	34,3414	531641	1		EXCH	1/DV3
0025	REF	4	LAST	822	34,3415	531637	0		EXCH	1/DV2
0026	REF	4	LAST	822	34,3416	531635	1		EXCH	1/DV1
0027	REF	1			34,3417	531571	1		EXCH	1/DV0
0028	REF	141	LAST	836	34,3420	0.6042	1		TC	INTERPRET
0029					34,3421	43345	1		ELCAD	DAO
0030	REF	2	LAST	836	34,3422	0.2571	1			1/DV4
0031	REF	5	LAST	836	34,3423	0.3635	1			1/DV1
0032					34,3424	43215	0		DAO	DAO
0033	REF	5	LAST	826	34,3425	0.3637	0			1/DV2
0034	REF	5	LAST	836	34,3426	0.2641	1			1/DV3
0035					34,3427	41205	0		DMP	DMP
0036	REF	4	LAST	834	34,3430	0.2265	1			VE
0037	REF	1			34,3431	211117	1			2SEC(9)
0038					34,3432	65252	1		SL3	PDCL
0039	REF	4	LAST	834	34,3433	0.2271	1			TRLP
0040					34,3434	43342	0		SR1	DAI
0041					34,3435	77625	0		DSL	
0042	REF	1			34,3436	211114	1			6SEC(18)
0043	REF	5	LAST	836	34,3437	16271	1		STEEL	TEUP
0044	REF	5	LAST	836	34,3440	0.2265	1			VE
0045					34,3441	56342	1		SR1	DDV
0046	REF	6	LAST	836	34,3442	0.2271	1			TEUP
0047	REF	5	LAST	832	34,3443	26263	0		STCALL	AT

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0048 REF 3 LAST 826 34,3444 60315 ASCENT

0049 34,3445 60315 4 81134 OCT 4

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PCC50

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0051          30,2315      BANK 30
0052 PFF 2 LAST 39      30,2315      SETTLE ASCENT
0053          30,2315      BANK
0054 PFF 2 LAST 39 TO 39: 2 2*      COUNT* 31/ASENT

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0055          30,2315      51575 1  ASCENT  VLOAD ABVAL
0056 PFF 18 LAST 832      30,2316      03521 1  P
0057 PFF 2 LAST 121      30,2317      26211 1  STCVL  /R/MAG
0058 PFF 2 LAST 832      30,2320      02726 1  ZAXIS1
0059          30,2321      72441 0  DCT  SL1
0060 PFF 9 LAST 832      30,2322      03527 1  V      Z.V = ZDCT*2(-9).
0061 PFF 2 LAST 120      30,2323      26313 1  STCVL  ZDCT      ZDCT*2(-7)
0062 PFF 3 LAST 838      30,2324      03726 1  ZAXIS1
0063          30,2325      76435 1  VXV  VSL1
0064 PFF 14 LAST 832      30,2326      03537 0  UNIT/R/      Z X UR = LAXIS*2(-2)
0065 PFF 2 LAST 120      30,2327      02303 0  STCPE  LAXIS      LAXIS*2(-1)
0066          30,2330      72441 0  DCT  SL1
0067 PFF 10 LAST 838      30,2331      03527 1  V      L.V = YDCT*2(-8).
0068 PFF 3 LAST 317      30,2332      36211 1  STCALL YDCT      YDCT * 2(-7)
0069 PFF 3 LAST 832      30,2333      57312 0  YDCMP
0070          30,2334      77775 1  VLOAD
0071 PFF 2 LAST 148      30,2335      03563 1  GDT1/2      LOAD GDT1/2*2(-7)M/CS.
0072          30,2336      50341 1  V/SC  DCT
0073 PFF 1          30,2337      27106 0  2SEC(18)
0074 PFF 15 LAST 838      30,2340      03537 0  UNIT/R/
0075          30,2341      47315 0  EDVL  VXV      G.UR*2(9) = GR*2(9).
0076 PFF 16 LAST 838      30,2342      2537 0  UNIT/R/      STCPE IN PCL(0)
0077 PFF 11 LAST 838      30,2343      03527 1  V      LCAD (UNIT/R/*2(-1)).
0078          30,2344      56236 0  VSG  DDV      UR*2(-1) x V*2(-7) = H/R*2(-8).
0079 PFF 3 LAST 838      30,2345      02311 1  /R/MAG      H(2)/R(2)*2(-16).
0080          30,2346      43352 1  SL1  DAC      H(2)/R(3)*2(9).
0081          30,2347      77626 0  STADR
0082 PFF 2 LAST 121      30,2350      75462 0  STCPE  GFFF      GFFF*2(10)M/CS/CS
0083          30,2351      45014 0  PFFF  CALL      IF P7071FLG = 1 (I.E. P70 OR P71)
0084 PFF 2 LAST 826      30,2352      4742 1  P7 71FLG      CALL ZDCTCMP TO UPDATE ZDCT
0085          30,2353      60355 1  +2      ON THE BASIS OF THE LAST RP.
0086 PFF 1          30,2354      71524 1  ZDCTCMP
0087          30,2355      45345 1  +2  DLOAD  DSL
0088 PFF 5 LAST 832      30,2356      02277 1  ZDCTC
0089 PFF 2 LAST 838      30,2357      72313 1  ZDCT
0090 PFF 2 LAST 121      30,2360      02343 1  STORE  DZDOT      DZDOT = (ZDCTC - ZDCT)*2(7)M/CS.
0091          30,2361      65261 0  VXSC  PDCL
0092 PFF 4 LAST 838      30,2362      02726 1  ZAXIS1
0093 PFF 3 LAST 834      30,2363      02275 0  YDCTC
0094          30,2364      77625 0  CSL
0095 PFF 4 LAST 838      30,2365      02211 0  YDOT

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0106	REF	2	LAST	121	30,2366	02341 0	STORE	NYDET	TYDET = (YDCCT - YDOT)*2(7)M/CS.
0107					30,2367	65361 0	VXSC	PDDL	
0108	REF	2	LAST	838	30,2370	02313 0		LAXIS	
0109	REF	5	LAST	832	30,2371	02272 0		RCCTC	
0110					30,2372	77625 0	CSU		
0111	REF	2	LAST	833	30,2373	03474 0		RECT	
0112	REF	2	LAST	121	30,2374	02337 1	STORE	DRDOT	DFDOT = (PDCTC - RDCT)*2(7)M/CS.
0113					30,2375	53361 0	VXSC	VAD	
0114	REF	17	LAST	838	30,2376	02527 0		UNIT/R/	
0115					30,2377	76455 1	VAD	VSL1	
0116					30,2400	77625 0	STADP		
0117	REF	3	LAST	201	30,2411	74121 1	STORE	VGVECT	VG = (DRECT)R + (FYCOT)L + (DZDOT)Z.
0118					30,2412	41345 0	LOAD	DMP	LOAD TGC
0119	REF	10	LAST	831	30,2412	02517 1		TGC	TGC GFFF
0111	REF	3	LAST	838	30,2414	02315 1		GFFF	
0111					30,2415	76561 1	VXSC	VSL1	
0112	REF	10	LAST	835	30,2416	03537 0		UNIT/R/	TCC GFFF UP
0113					30,2417	77645 0	BVSU		
0114	REF	4	LAST	835	30,2410	03645 0		VGVECT	COMPENSATED FOR GFFF
0115	REF	5	LAST	839	30,2411	03646 0	STORE	VGVECT	STORE FOR DOWNLINK
0116					30,2412	76521 0	MXV	VSL1	GFT VGCCY FOR A85 DISPLAY
0117	REF	4	LAST	806	30,2413	02146 0		XNBRIF	
0118	REF	10	LAST	829	30,2414	27512 0	STOVL	VGRDNY	
0119	REF	6	LAST	839	30,2415	03646 0		VGVECT	
0120					30,2416	43746 1	ABVAL	RCFF	MAGNITUDE OF VGVECT
0121	REF	3	LAST	836	30,2417	04745 0		FLRCS	IF FLRCS=0, NO NORMAL GUIDANCE
0122	REF	1			30,2420	60427 0		MAINFAG	
0123					30,2421	77671 1	FDV		USE TGC=VG/AT WITH RCS
0124	REF	1			30,2422	20001 1		AT/RCS	
0125	REF	2	LAST	835	30,2422	07517 0	STCALL	TGC	THIS WILL BE USED ON NEXT CYCLE
0126	REF	1			30,2424	71475 1		RPOCKE1	COMPUTE NEW PP FOR NEXT CYCLE.
0127					30,2425	77651 1	CCTO		
0128	REF	1			30,2426	60754 1		ASCTERM2	
0129					30,2427	41471 1	MAINFAG	DDV	VG/VE IN PDL(0)
0130	REF	6	LAST	836	30,2430	02265 1		PUSH	(2)
0131					30,2431	44342 1		VE	
0132	REF	1			30,2432	17771 0	SRI	RDSU	1 - VG / 2 VE
0133					30,2433	41205 0		NEARONF	
0134	REF	7	LAST	836	30,2434	02271 1	DMP		TBUP VG(1-KT VG/VE)/VE
0135					30,2435	77625 0		TBLP	= TCC
0136	REF	4	LAST	834	30,2436	02267 0	CSU		COMPENSATE FOR TAILOFF
0137	REF	21	LAST	839	30,2437	03517 1		TTC	
0138					30,2440	57461 0	STORE	TGC	
0139					30,2441	27614 0	SR	CCCMF	
0140	REF	25	LAST	739	30,2442	17454 1		110	
0141	REF	22	LAST	835	30,2442	02517 1	STOVL	TTCGO	TGC*2(-2F)CS
0142					30,2444	45214 1		TGC	
0143	REF	5	LAST	826	30,2445	03711 1	RDA	7SL	
0144	REF	1			30,2446	60452 1		1DLFFLAG	
0145	REF	2	LAST	766	30,2447	21016 1		T2TEST	
								4SEC(17)	(TGC - 4) * 2 (-17) CS.

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0146					2,2450	77640 C	BMM		
0147	REF	1			30,2451	33347 1		PAGGER	
0148					30,2452	77745 1	T2TEST	CLCAC	
0149	REF	23	LAST	836	30,2453	03517 1		TGC	
0150					30,2454	50125 0	DSU	BMM	IF TGC - T2 NEG., GC TO COMPONENT
0151	REF	1			30,2455	21110 0		T2A	
0152	REF	1			30,2456	60612 1		COMPONENT	
0153					30,2457	45345 1	CLCAC	DSU	
0154	REF	8	LAST	835	30,2460	02271 1		TBLP	
0155	REF	24	LAST	840	30,2461	03517 1		TGC	
0156					30,2462	45071 0	CCV	CALL	1-TGC/TBLP
0157	REF	9	LAST	840	30,2462	02271 1		TBLP	
0158	REF	1			30,2464	61023 1		LOGSUB	
0159					30,2465	41461 1	SL	PUSH	-L IN PCL(0)
0160					30,2466	20216 1		S	(2)
0161					30,2467	44265 0	BDDV	BDSU	-TGC/L*2(-17)
0162	REF	25	LAST	840	30,2470	03517 1		TGC	
0163	REF	10	LAST	840	30,2471	02271 1		TBLP	TBLP + TGC/L = 012*2(-17)
0164					30,2472	43006 0	PUSH	PCN	STORE IN PCL(2)
0165	REF	1			30,2473	04703 1		FLPC	IF FLPC = 1, GC TO CONST
0166	REF	1			30,2474	61503 1		NCRATES	(4)
0167					30,2475	45345 1	CLCAC	DSU	
0168	REF	26	LAST	840	30,2476	03517 1		TGC	
0169	REF	1			30,2477	21112 1		T3	
0170					30,2500	43044 0	EPL	SET	FLPC=1
0171	REF	1			30,2501	61510 0		RATES	
0172	REF	2	LAST	840	30,2502	04463 1		FLPC	
0173					30,2503	77745 1	NCRATES	CLCAC	
0174	REF	9	LAST	834	30,2504	06524 1		HICZPROS	
0175	REF	2	LAST	121	30,2505	02351 1		STORE	B = 0
0176	REF	2	LAST	121	30,2506	36253 1		STCALL	C = 0
0177	REF	1			30,2507	61572 1		CONST	GC TO CONST
0178					30,2510	45345 1	RATES	CLCAC	
0179	REF	27	LAST	840	30,2511	03517 1		DSU	
0180					30,2512	00003 0		TGC	TGC - 012 = 021*2(-17)
0181					30,2513	72406 0	PUSH	SL1	IN PCL(4)
0182					30,2514	52421 1	BDSU	SL3	(1/2TGC - 021)*2(-13) = E * 2(-13)
0183	REF	28	LAST	840	30,2515	03517 1		TGC	(8)
0184					30,2516	41225 0	PDDL	DMP	IN PCL(6)
0185	REF	29	LAST	840	30,2517	03517 1		TGC	
0186	REF	3	LAST	835	30,2520	03474 1		PDCT	PDCT TGC * 2(-24)
0187					30,2521	45215 0	BAD	DSU	R + PDCT TGC
0188	REF	4	LAST	838	30,2522	02301 1		/R/MAC	R + PDCT TGC - RCD
0189	REF	4	LAST	834	30,2523	02631 1		RCD	MFAC = - CF*2(-24).
0190					30,2524	41225 0	PDDL	DMP	-CF IN PCL(8)
0191	REF	3	LAST	835	30,2525	02337 1		DEFCT	(10)
0192					30,2526	00005 1		PDCT	021 DRDCT*2(-24)
0193					30,2527	62415 0	BAD	SL2	(021 DRDCT-DR)*2(-22)
0194					30,2530	56271 0	CCV	DEV	(8)
0195					30,2531	00007 0		DED	(021 DRDCT-DR)/E*2(-9)

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0194	REF	3	LAST	840	31,2532	03517 1	TCC		
0197	REF	3	LAST	840	31,2533	02351 1	STORE	PRATE	B * 2(B)
0198					31,2534	71241 1	BMA	ELCAG	P>0 NOT PERMITTED
0199	REF	1			31,2535	02541 1		CHKPMAG	
0200	REF	1	LAST	841	31,2536	05524 1		H16ZCDNS	
0201	REF	4	LAST	841	31,2537	36351 0	STCALL	PRATE	
0212	REF	1			31,2540	07552 1		PRCK	
0213					31,2541	56212 1	CHKPMAG	SR4	B*2(4)
0214	REF	11	LAST	840	31,2542	02271 1		TRUP	(P / TAL) * 2(21)
0215					31,2543	51125 1	DSL	PPL	
0216	REF	1			31,2544	26201 0		PPLIMIT	(B / TAL) * 2(21) MAX.
0217	REF	2	LAST	841	31,2545	60552 1		PRCK	
0218					31,2546	41345 0	LLDAD	DMP	
0219	REF	2	LAST	841	31,2547	26211 0		PPLIMIT	
02110	REF	12	LAST	841	31,2550	02271 1		TRUP	B MAX. * 2(4)
0211					31,2551	77612 1	SL4		BMAX*2(8)
0212	REF	5	LAST	841	31,2552	02351 1	STORE	PRATE	
0213					31,2553	77745 1	PRCK	ELCAG	
0214	REF	21	LAST	841	31,2554	03517 1		TCC	
0215					31,2555	43205 1	DMP	DAD	YDCT TGC
0216	REF	5	LAST	838	31,2556	02311 0		YDCT	
0217	REF	5	LAST	832	31,2557	02335 0		Y	Y + YDCT TGC
0218					31,2558	65225 1	DSL	PDDL	Y + YDCT TGC - YCC
0219	REF	6	LAST	834	31,2559	03633 1		YCC	MPAC = - DY*2(-24.) IN PDL(8)
0220	REF	2	LAST	835	31,2562	02341 0		RYDCT	(10)
0221					31,2563	43205 1	DMP	DAD	C21 DYDCT - DY
0222					31,2564	00015 1		14C	(8)
0223					31,2565	56312 1	SL2	DOV	(C21 RYDCT - (Y)/F*2(-5)
0224					31,2566	40271 1	DOV	SETPD	(C21 RYDCT - DY)/F TGC*2(8)
0225	REF	22	LAST	841	31,2567	02517 1		TGC	= D*2(8)
0226					31,2570	00005 1		04	
0227	REF	3	LAST	840	31,2571	02353 0	STORE	YRATE	
0228					31,2572	41345 0	CCAST	ELCAG	LCAD E*2(8)
0229	REF	6	LAST	841	31,2573	02351 1		PRATE	B C12*2(-9)
0230					31,2574	05113 1		02C	
0231					31,2575	56325 0	PDDL	DOV	C12 B IN PDL(4)
0232	REF	4	LAST	840	31,2576	02337 1		DRDCT	(6)
0233					31,2577	01001 0		10C	LCAD DRDCT*2(-7)
0234					31,2578	45212 1	SR2	DSL	-CRDCT/L*2(-7)
0235					31,2601	77626 0	STADR		(-CRDCT/L-C12 B)=A*2(-5)
0236	REF	2	LAST	121	31,2602	61422 0	STCDL	PCONS	(4)
0237	REF	4	LAST	841	31,2603	02353 0		YRATE	E*2(8)
0238					31,2604	65215 0	DMP	PDDL	C12 C, EXCH WITH -L IN PDL(6)
0239					31,2605	60465 0	BDDV	SR2	(2,2)
0240	REF	4	LAST	841	31,2606	02341 0		DYDCT	-DYDCT/L*2(-9)
0241					31,2607	77625 0	DSL		(-DYDCT/L-C12 C)=C*2(-5)
0242					31,2610	00011 0		02C	
0243	REF	2	LAST	121	31,2611	02347 0	STORE	YCONS	
0244					31,2612	43001 1	COMPONENT	SETPD	REF
0245					31,2613	00001 0			(0)

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0246	REF	2	LAST	838	30,2614	64742 1	P7071FLG		
0247					30,2615	60621 0	+3		
0248					30,2616	77624 1	CALL		IF P7071FLG = 1 (I.E. P70 OR P71) COMPLETE NEW RP FOR NEXT CYCLE.
0249	REF	1			30,2617	71501 0			
0250					30,2620	41345 0	+2	CLOAD	DMP
0251	REF	1			30,2621	27116 0			100CS
0252	REF	7	LAST	841	30,2622	02251 1			PRATE
0253					30,2623	56215 1		PAC	DDV
0254	REF	2	LAST	841	30,2624	02245 1			PCCAS
0255	REF	13	LAST	841	30,2625	02271 1			TRUP
0256					30,2626	46352 1		SL1	DSU
0257	REF	4	LAST	839	30,2627	02215 1			GEFF
0258	REF	2	LAST	121	30,2628	16357 1		STOCL	ATP
0259	REF	2	LAST	842	30,2631	27116 0			100CS
0260					30,2632	43205 1		DMP	DAD
0261	REF	5	LAST	841	30,2633	02353 0			YRATE
0262	REF	2	LAST	841	30,2634	02347 0			YCCNS
0263					30,2635	72471 0		DDV	SL1
0264	REF	14	LAST	842	30,2636	02271 1			TRUP
0265	REF	4	LAST	832	30,2637	02355 0		STOPE	ATY
0266					30,2638	65361 0		VXSC	PDDL
0267	REF	4	LAST	830	30,2641	02313 0			LAXIS
0268	REF	3	LAST	842	30,2642	02357 1			ATR
0269					30,2643	53361 0		VXSC	VAD
0270	REF	19	LAST	830	30,2644	02337 0			UNIT/R/
0271					30,2645	41572 1		VSL1	PUSH
0272					30,2646	65246 1		ABVAL	PDDL
0273	REF	6	LAST	836	30,2647	02263 1			AT
0274					30,2650	45316 1		DSQ	DSU
0275					30,2651	00143 0			340
0276					30,2652	41525 0		PDDL	PLSH
0277	REF	7	LAST	842	30,2653	02263 1			AT
0278					30,2654	45316 1		DSQ	DSL
0279					30,2655	00343 0			340
0280					30,2656	71241 1		BMA	DLCAD
0281	REF	1			30,2657	60663 1			NE-ATP
0282					30,2660	00011 1			80
0283					30,2661	52166 1		SGRT	GCTD
0284	REF	1			30,2662	60671 1			AIMCP
0285					30,2663	55345 0	NE-ATP	CLCAD	BDDV
0286					30,2664	00007 0			60
0287					30,2665	77761 1		VXSC	
0288					30,2666	00001 0			DDC
0289					30,2667	14071 0		STOCL	DDC
0290	REF	11	LAST	841	30,2670	06524 1			H16ZFRCS
0291					30,2671	77765 0	ATWER	SIGN	
0292	REF	3	LAST	838	30,2672	02343 1			DZDCT
0293	REF	3	LAST	833	30,2673	02361 1		STORE	ATP
0294					30,2674	77761 1		VXSC	
0295	REF	5	LAST	838	30,2675	02726 1			ZAXIS1

ATP ZAXIS #2(8).

L ASCENT GUIDANCE

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0296				31,2676	53272 1	VSLL	VAD	AT*2(9)
0297				31,2677	00 11 1		QCD	
0298	RFF	16	LAST	832	31,2711	73254 1	STORE	UNFC/2
0299					20,27 1	430 1 1	SETFC	BCN
0300					31,2712	11711 1		QCD
0301	RFF	2	LAST	833	31,2713	14714 0		FLP1
0302	RFF	1			31,2714	67216 1		P12RFT
0303					31,2715	77614 1	BCN	
0304	RFF	2	LAST	831	31,2716	14701 0		FLVP
0305	RFF	1			31,2717	61763 0		CHECKALT
0306					21,2711	57575 1	MAINLINE	VLCAD
0307	RFF	27	LAST	842	31,2711	02527 0		VECOMP
0308	RFF	7	LAST	836	31,2712	17262 1	STORE	UNFC/2
0309	RFF	2	LAST	834	31,2713	02654 0		TXC
0310					21,2714	51125 1	DSL	BFL
0311	RFF	16	LAST	811	31,2715	01234 0		PIPTIME
0312	RFF	1			31,2716	60730 0		ASCTERM
0313					31,2717	77614 1	BCN	
0314	RFF	2	LAST	828	31,2721	04711 1		RCFLAG
0315	RFF	1			31,2721	57272 1		ANGICFCK
0316					31,2722	43114 0	CLIMXFLAC	CLEAR
0317	RFF	5	LAST	796	31,2723	06666 1		RCN
0318	RFF	4	LAST	842	31,2724	04702 0		XCVINFLG
0319	RFF	2	LAST	843	31,2725	61730 0		P7071FLG
0320					31,2726	77614 1		ASCTERM
0321	RFF	1			31,2727	01664 1	CLEAR	
0322					31,2731	77776 1	ASCTERM	EXIT
0323	RFF	5	LAST	820	31,2731	3 0115 0	CA	FLAGWDS
0324	RFF	1			31,2732	7 4742 0	MASK	FLGCSHIT
0325	RFF	248	LAST	820	31,2733	10 000 0	CCS	A
0326	RFF	1			31,2734	1 2755 0	ICF	ASCTERM3
0327	RFF	142	LAST	830	31,2735	0 6142 1	TC	INTPRET
0328					31,2736	77624 1	CALL	
0329	RFF	4	LAST	817	31,2737	61176 1		FINDCDUW -2
0330					31,2740	77776 1	ASCTERM1	EXIT
0331	RFF	6	LAST	842	31,2741	3 0115 0	+1	CA
0332	RFF	1	LAST	842	31,2742	7 4742 0	MASK	FLAGWDS
0333	RFF	240	LAST	842	31,2743	10 000 0	CCS	FLGCSHIT
0334	RFF	2	LAST	842	31,2744	1 2755 0	ICF	A
0335	RFF	13	LAST	807	31,2745	3 0114 1	CA	ASCTERM3
0336	RFF	2	LAST	808	31,2746	7 4742 0	MASK	FLAGWDS
0337	RFF	250	LAST	842	31,2747	10 000 0	CCS	FLUNCEIT
0338	RFF	3	LAST	842	31,2751	1 2755 0	ICF	A
0339	RFF	1			31,2751	2 3121 0	TCF	ASCTERM2
0340	RFF	232	LAST	832	31,2752	0 4616 1	CAF	VP6M63*
0341	RFF	1			31,2753	21444 1	TC	BACKCALL
0342					31,2754	77776 1	CAF	GENSP
0343	RFF	131	LAST	828	31,2755	1 5155 1	ASCTERM2	EXIT
0344					31,2756	77776 1	ASCTERM3	TCF
0345					31,2757	0 114 0	ASCTERM4	EXIT
								INHINT

INSUFF THAT THE RCN 63 DISPLAY IS
BYPASSED IF WE ARE IN THE RCS TRIMMING
MODE OF OPERATION

BYPASS DISPLAYS IF ENGINE FAILURE IS
INDICATED.

L ASSENT GUIDANCE

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0346	REF	4	LAST	833	30,2760	0 4674 0	TC	IBKCALL	NO GUIDANCE THIS CYCLE -- FENCE ZERO THE GAP COMMANDED RATES.
0347	REF	5	LAST	837	30,2761	40166 1	CAIR	STDRATE	
0348	REF	1			30,2762	1 2741 0	TCF	ASCTERM1 +1	
0349					30,2762	45345 1	CHECKALT	ELDAD	DSL
0350	REF	5	LAST	840	30,2764	72311 1			/R/MAG
0351	REF	5	LAST	834	30,2765	52333 0			/LANE/
0352					30,2766	51125 0	DSL	BMM	IF F LT 25K CHECK Z AXIS ORIENTATION.
0353	REF	1			30,2767	26215 1		25KFT	
0354	REF	1			30,2770	16667 1		CHECKYAW	
0355					30,2771	43014 0	EXITVR	CLEAR	BCN
0356	REF	4	LAST	843	30,2772	04661 1			FLVR
0357	REF	3	LAST	842	30,2773	74711 1			PCTFLAG
0358	REF	1			30,2774	67711 1			MAINLINE
0359					30,2775	43245 1	ELCAD	CAD	
0360	REF	17	LAST	842	30,2776	01234 0			PIPTIME
0361	REF	1			30,2777	25747 1			LOSSES
0362	REF	4	LAST	842	30,2778	37654 1	STCALL	TXC	
0363	REF	2	LAST	844	30,2779	67711 1			MAINLINE
0364					30,2780	77614 1	EXITVR1	CLREC	
0365	REF	4	LAST	844	30,2781	74631 1			PCTFLAG
0366	REF	1			30,2782	67711 1			EXITVR
0367	REF	3	LAST	44	27,2780		SETLCC	ASSENT1	
0368					27,2779		BANK		
0369	REF	1					COUNT*	44/ASSENT	
0370					27,2773	50275 0	ANGICHEK	VLCAD	DCT
0371	REF	17	LAST	842	27,2774	03254 1			UNFC/2
0372	REF	5	LAST	839	27,2775	02146 0			XNBP1P
0373					27,2776	51025 1	DSL	BFL	
0374	REF	2	LAST	122	27,2777	02571 0			COSTHFT1
0375	REF	1			27,2778	57207 1			CFFRCT
0376					27,2779	50275 0	VLCAD	DCT	
0377	REF	6	LAST	844	27,2780	02146 0			XNBP1P
0378	REF	21	LAST	842	27,2781	03537 0			UNIT/9/
0379					27,2782	50275 0	DSL	BMM	
0380	REF	2	LAST	123	27,2783	02573 1			COSTHFT2
0381	REF	1			27,2784	71452 0			KEEPVPI
0382					27,2785	77614 1	CFFRCT	CLREC	
0383	REF	5	LAST	844	27,2786	04631 1			PCTFLAG
0384	REF	1			27,2787	60722 0			CLRXFLAG
0385					07,2667		BANK	7	
0386	REF	1			07,2667		SETLCC	ASSENT2	
0387					07,2667		BANK		
0388	REF	1					COUNT*	44/ASSENT	
0389	REF	2	LAST	844	07,2667		SETXFLAG	=	CHECKYAW

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0390					17,267	77614	1	CHECKYAW SET		
0391	REF	6	LAST	842	17,267	16466			XCVINFLG	PROFIEIT X-AXIS OVERPIDE
0392					17,267	74345	0	CLOAC	VXSC	
0393	REF	5	LAST	842	17,267	12755	0		ATY	
0394	REF	5	LAST	842	17,267	12733	0		LAXIS	
0395					17,267	74325	0	PDDL	VXSC	
0396	REF	4	LAST	842	17,267	12361	1		ATF	
0397	REF	6	LAST	842	17,267	13726	1		ZAXIS1	
0398					17,267	53455	0	VAC	UNIT	
0399					17,271	45325	1	PDDL	DSL	
0400	REF	4	LAST	840	17,271	13474	0		RDOT	
0401	REF	1			17,272	12471	1		40FPS	
0402					17,273	52044		RPL	GOTO	
0403	REF	1			17,274	61702	1		EXITVP1	
0404	REF	1			17,275	71446	1		KEEPVP	

0405					15,347			BANK	5	
0406	REF	1			15,347			SETLCC	ASENT3	
0407					15,347			BANK		
0408	REF	1						COUNT#	11/ASENT	

0409					15,347	10017	1	40FPS	2DFC	0.12192 R-7
0410					15,347	222	0			
0411					34,346			BANK	34	
0412	REF	2	LAST	834	34,346			SETLCC	ASENT3	
0413	REF	2	LAST	836 TC	34,346			BANK		
0414					34,346	44	44*	COUNT#	11/ASENT	

0415					34,346	45475	1	KEEPVR	VLCAD	STAPP
0416	REF	8	LAST	842	34,347	74515	0		STORE	UNWC/2
0417					34,345	77775	1	KEEPVR1	VLCAD	
0418	REF	22	LAST	844	34,345	12527	1		UNIT/F/	
0419	REF	18	LAST	844	34,345	27254		STCALL	UNFC/2	
0420	REF	2	LAST	842	34,345	61731	0		ASCTERM	

0421					14,2347			BANK	14	
0422	REF	1			14,2347			SETLCC	ASENT4	
0423					14,2347			BANK		
0424	REF	1						COUNT#	11/ASENT	

0425					14,2347	77634	0	ENGDEF	FTF	
0426	REF	24	LAST	834	14,235	21574	1		LOADTIME	
0427					14,235	42225	0	DSU	LAD	
0428	REF	18	LAST	844	14,235	11234	0		PIPTIME	
0429	REF	26	LAST	835	14,235	12454	1		TYGGE	
0430					14,235	77475	1	BCOMP	EXIT	
0431	REF	11	LAST	740	14,235	7262	0	IC	TPAGREE	FORCE SIGN AGREEMENT ON MPAC, MPAC +1.
0432	REF	0	LAST	747	14,235	35716	0	CAF	FRANK7	
0433	REF	24	LAST	820	14,235	54	013	IS	FBANK	

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0433	REF	33	LAST	841	F7,1516	0 0004 0	FRANK= TGO		
0434					14,2360	0 0004 0	INFIN		
0435	REF	329	LAST	836	14,2361	10 155 1	CCS	NRAC +1	
0436					14,2362	1 2365 1	TCF	+3	C(A) = DT - 1 BIT
0437					14,2363	1 2365 1	TCF	+2	C(A) = 0
0438	REF	157	LAST	831	14,2364	3 4755 1	CAF	ZERO	C(A) = 0
0439	REF	40	LAST	824	14,2365	6 4753 1	AD	BIT1	C(A) = 1 BIT OR DT.
0440	REF	2	LAST	152	14,2366	55 644 1	TS	ENGCEFFCT	
0441	REF	24	LAST	823	14,2367	1 5173 1	TC	TAIDCLE	
0442	REF	1			14,2371	02402 0	ACRES	ENGCEFF1	
0443	REF	68	LAST	836	14,2371	0 5352 1	TC	PHASCHNG	
0444					14,2372	47014 1	CCT	47014	
0445	REF	2	LAST	846	14,2373	76133 1	-CEMADR	ENGCEFFCT	
0446	REF	24	LAST	846	F7,1516		EBANK= TGO		
0447	REF	2	LAST	846	14,2374	02402 0	2CADR	ENGCEFF1	
0447					14,2375	30067 0			
0448	REF	143	LAST	843	14,2376	0 6142 1	TC	INTERPT	
0449					14,2377	52014 0	SET	GCTC	
0450	REF	7	LAST	839	14,2400	03471 1		IDIFFLAG	DISABLE DELTA-V MONITOR
0451	REF	2	LAST	839	14,2411	60452 1		T2TEST	
0452	REF	41	LAST	844	14,2402	0 4674 0	ENGCEFF1	TC	IBANKCALL
0453	REF	1			14,2403	75555 0	CADR	ENGINEF2	SHUT OFF THE ENGINE.
0454	REF	5	LAST	828	14,2404	3 5027 1	CAF	PRIC17	SET UP A JCB FOR THE ASCENT GUIDANCE
0455	REF	36	LAST	810	14,2405	0 5115 0	TC	FINDVAC	POSTBURN LOGIC.
0456	REF	29	LAST	832	F7,1455		EBANK= WHICH		
0457	REF	2	LAST	739	14,2406	02416 0	2CADR	CUTOFF	
0457					14,2407	30067 0			
0458	REF	60	LAST	846	14,2410	0 5353 1	TC	PHASCHNG	
0459					14,2411	07024 0	CCT	07024	
0460					14,2412	17000 1	CCT	17000	
0461	REF	35	LAST	846	F7,1516		EBANK= TGO		
0462	REF	4	LAST	846	14,2413	02416 0	2CADR	CUTOFF	
0462					14,2414	30067 0			
0463	REF	58	LAST	823	14,2415	1 5261 0	TCF	TASKCVFR	
0464	REF	55	LAST	828	14,2416	0 5504 0	CUTOFF	TC	UPFLAC
0465	REF	4	LAST	839	14,2417	10214 0	ACRES	FLACS	SET FLACS FLAG.
0466	REF	1			14,2420	2 2427 0	-5	CAF	V16N63
0467	REF	233	LAST	843	14,2421	0 4616 1	TC	BANKCALL	
0468	REF	24	LAST	832	14,2422	2 477 1	CADR	GCEFLASH	
0469					14,2423	1 2426 1	TCF	+3	
0470	REF	1			14,2424	1 2425 0	TCF	CUTOFF1	
0471					14,2425	1 2420 1	TCF	-5	
0472	REF	51	LAST	833	14,2426	0 4635 0	+2	TC	POSTJLMP
0473	REF	1			14,2427	71464 1	CADP	TERMASC	

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0474					14,243	0 4674 0	CUTOFF1	INHINT	
0475	REF	42	LAST	846	14,243	1 4674 1		TC	IPNKCALL
0476	REF	4	LAST	809	14,242	40154 0		CADR	ZATTERCE
0477	REF	43	LAST	847	14,243	0 4674 0		TC	IPNKCALL
0478	REF	5	LAST	749	14,243	40161 1		CADR	SETMINDB
0479	REF	52	LAST	846	14,243	0 4635 0		TC	POSTJUMP
0480	REF	1			14,243	71454 1		CADR	CUTOFF2
0481					14,243	04177 0	V15N62	VM	1653
0482					34,245			BANK	34
0483	REF	3	LAST	845	34,245			SETLOC	ASFNTF
0484					34,245			BANK	
0485	REF	3	LAST	845 TC	34,245	6 50*		CLINT*	44/ASENT
0486	REF	70	LAST	846	34,245	0 5353 1	CUTOFF2	TC	PHASCHNG
0487					34,245	04024 0		CCT	04024
0488	REF	1			34,245	3 3474 0		CAD	V16NE50
0489	REF	234	LAST	846	34,245	0 4015 1		TC	BANKCALL
0490	REF	25	LAST	846	34,246	2 477 1		CADR	GCFASH
0491	REF	2	LAST	846	34,246	1 3464 0		TCF	TERMASO
0492					34,246	1 3464 0		TCF	+2
0493	REF	2	LAST	847	34,246	1 3454 0		TCF	CUTOFF2
0494	REF	71	LAST	847	34,246	0 5353 1	TERMASO	TC	PHASCHNG
0495					34,246	04024 0		CCT	04024
0496					34,246	0 0014 0		INHINT	
0497	REF	44	LAST	847	34,246	0 4674 0		TC	IPNKCALL
0498	REF	7	LAST	748	34,247	40115 0		CADR	RESTCRDR
0499	REF	98	LAST	833	34,247	1 5516 0		TC	DOWNFLAG
0500	REF	2	LAST	828	34,247	00215 1		ADRES	1STABORT
0501	REF	33	LAST	832	34,247	1 5001 1		TCF	GETCFCGH
0502					34,247	04125 0	V16N850	VM	1685
0503					34,247	77745 1	RECCVF1	ELCAC	
0504	REF	12	LAST	842	34,247	16524 1			PIAZEROS
0505	REF	4	LAST	842	34,247	02345 1		STORE	PCONS
0506	REF	8	LAST	842	34,250	02751 1		STORE	PRATE
0507					34,250	41345 0	RECCVF2	CLOAD	DMP
0508	REF	0	LAST	847	34,250	002351 1			PRATE
0509	REF	36	LAST	946	34,250	13517 1			TGP
0510					34,250	43205 1		DMP	DAC
0511	REF	2	LAST	640	34,250	23645 0			TH120
0512	REF	5	LAST	947	34,250	12245 1			PCONS
0513					34,250	41205 0		DMP	DMP
0514	REF	27	LAST	847	34,251	13517 1			TGP
0515	REF	38	LAST	847	34,251	13517 1			TGP
0516					34,251	72471 0		CDV	SL1

ZERO ATTITUDE ERRORS BEFORE RELOADING CP.

FRCCFFC

RESTORE DEADBAND DESIRED BY ASTRONAUT.

DISALLOW ABORTS AT THIS TIME.

FLRCS = 1 (TRIV MODE)

SET PCONS = PRATE = 0 SO THAT

FLRCS = 0 (GUIDANCE MODE)

LEAVE PCONS AND PRATE ALONE SO THAT
 $RF = R + RDCT TGC + (PCONS * TGC * 2) / (2 TRUP) + (PRATE * TGC * 3) / (6 TRUP)$

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0517	REF	15	LAST	842	34,3513	02271	1		TEUP		
0518					34,3514	65215	1		PDCL		
0519	REF	6	LAST	844	34,3515	02271	1		/R/MAG		
0520	REF	5	LAST	845	34,3516	03474	0		RECT		
0521					34,3517	43205	1		DAD		
0522	REF	35	LAST	847	34,3520	13517	1		TGO		
0523					34,3521	77626	0		STADR		
0524	REF	2	LAST	828	34,3522	75152	0		STORE	RP	
0525					34,3523	77616	0		PVQ		
0526					34,3524	45020	1	ZDCTCMP	STC	CALL	COMPUTE CENTRAL ANGLE (0)
0527	REF	1			34,3525	02574	0			ASC SAVE	
0528	REF	2	LAST	827	34,3526	71554	0		THETCMP		
0529					34,3527	42275	1		DAD		CENTRAL ANGLE IN MPAC
0530	REF	2	LAST	123	34,3530	02623	1		KPAPM		
0531	REF	3	LAST	827	34,3531	02621	0		JPAPM		
0532					34,3532	41425	1		PLSH		RA IN MPAC AND IN PUSH-LIST (2)
0533	REF	3	LAST	848	34,3533	12625	1		RP		
0534					34,3534	51725	1		PSL		
0535	REF	2	LAST	123	34,3535	02563	0		PAMIN		
0536					34,3536	71541	1		+3		
0537					34,3537	65345	0		ELCAP	PDCL	RA < RMIN. SET RA = RMIN. (2)
0538	REF	3	LAST	848	34,3540	02563	0		PAMIN		
0539					34,3541	41345	0	+3	ELCAP	DMP	
0540					34,3542	00001	0		DD		
0541	REF	1			34,3543	16725	1		MUM(-37)		
0542					34,3544	77725	1		PDCL		
0543					34,3545	41215	1		DAD	DMP	
0544	REF	4	LAST	848	34,3546	02625	1		RF		
0545	REF	5	LAST	848	34,3547	02625	1		RF		
0546					34,3550	75465	1		PDDV	SCRT	(0)
0547					34,3551	77626	0		STADR		
0548	REF	6	LAST	838	34,3552	41510	1		STCALL	ZDCTD	UPDATE ZDCT FOR GUIDANCE AND DOWNLINK.
0549	REF	2	LAST	848	34,3553	02574	0			ASC SAVE	
0550					34,3554	52575	0	THETCMP	VLCAP	UNIT	
0551	REF	19	LAST	838	34,3555	02521	1			P	
0552					34,3556	53515	0		PRVL	UNIT	(6)
0553	REF	4	LAST	726	34,3557	01720	0			R(CSM)	
0554					34,3560	47716	0		PUSH	VXV	(12)
0555					34,3561	11111	0			DD	
0556					34,3562	77641	1		DCT		
0557	REF	5	LAST	834	34,3563	02325	1			WM	
0558					34,3564	24037	0		STCVL	300	(6)
0559					34,3565	72441	0		DCT	SL1	(10)
0560					34,3566	75376	1		ARCCCS	SIGN	
0561					34,3567	00027	0			300	
0562					34,3570	77615	0		PVQ		
0563	REF	16	LAST	806	35,1574			ASC SAVE	=	CC	

1 ASCENT DISTANCE

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0564					27,3312				BANK	27
0565	RFF	4	LAST	844	27,2000				SETLCC	ASCENT
0566					27,3312				BANK	
0567	RFF	2	LAST	844 TC	844:	15	15#		COUNT#	11/ASCENT
0568					27,3312	50375	0	YCCMP	VLCAD	DCT
0569	RFF	23	LAST	844	27,3313	03537	1		UNIT/0/	
0570	RFF	2	LAST	834	27,3314	03727	1		CAYIS	
0571					27,3315	41312	1		SL2	DME
0572	RFF	5	LAST	840	27,3316	03631	0		PCD	
0573	RFF	6	LAST	841	27,3317	02335	0		STCPE	Y
0574					27,3320	77616	0		RV0	
R0575										
0576					27,3325				BANK	30
0577	RFF	2	LAST	838	27,3310				SETLCC	ASCENT
0578					30,3005				BANK	

1 ASCENT GUIDANCE

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P0579 ASCENT GUIDANCE CONSTANTS

0580	REF	2	LAST	838	33,31.5	100CS	EQUALS	2SEC(18)	
0581	REF	1			30,30.7	T2A	EQUALS	2SEC(17)	
0582					30,30.5	00062 0	4SEC(17)	2DEC	400 E-17
0582					30,30.6	00000 1			
0583					30,30.7	00031 0	2SEC(17)	2DEC	200 E-17
0583					30,31.0	00000 1			
0584					30,31.1	000175 1	T3	2DEC	1000 E-17
0584					30,31.2	00000 1			
0585					30,30.13	00045 1	6SEC(18)	2DEC	600 E-18
0585					30,30.14	20010 0			
0586					30,31.15	00010 0	BIT4F	00T	10
0587					30,31.16	14460 0	2SEC(19)	2DEC	200 E-9
0587					30,31.17	00000 1			
0588					30,31.20	01477 1	V06N63*	VN	0663
0589					30,31.21	01514 0	V06N76	VN	0676
0590					30,31.22	01441 1	V06N33A	VN	0633
0591					33,22.10		BANK	33	
0592	REF	1			33,22.11		SETLCC	ASENT6	
0593					33,22.00		BANK		
0594	REF	1					COLN1*	\$4/ASENT	
0595					33,22.10	75751 0	PRIMIT	2DEC	-.0639
0595					33,22.11	41775 1			
0596					33,22.12	00022 1	MINABDV	2DEC	.0356 E-5
0596					33,22.13	07212 1			
0597					33,22.14	00007 0	25KFT	2DEC	7620 E-24
0597					33,22.15	16100 1			
0598	REF	2	LAST	148	17,15.70	1/CDV	=	MASS1	

(B/TBLP)MIN=-.1F1.SEC(-3)

10 PERCENT BIGGER THAN GRAVITY

L ASCENT GUIDANCE

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R0516 THE LOGARITHM SUBROUTINE

0610			24,2677	BANK	24
0611	REF	1	31,2000	SFTLOC	FLOGSLB
0612			31,3023	BANK	

R0613 INPUT X IN MPAC

R0614 CLIPUT -LOG(X) IN MPAC

0615			31,2022	44301	C	FLOGSLB	MPAC	BFSU
0616	REF	341	LAST	846	31,2024	07163	0	MPAC +6
0617	REF	2	LAST	835	31,2025	17771	0	MPACONE
0618			31,3026	77776	1			EXIT
0619	REF	1			31,3027	17225	0	TC
0610			31,3028	00116	1			CFC
0611			31,3029	00000	1			2DEC
0611			31,3032	00000	0			
0612			31,3033	76777	1			2DEC
0612			31,3034	77175	1			
0613			31,3035	77470	0			2DEC
0613			31,3036	75416	0			
0614			31,3037	77517	0			2DEC
0614			31,3040	65515	0			
0615			31,3041	77741	0			2DEC
0615			31,3042	63547	1			
0616			31,3043	77520	0			2DEC
0616			31,3044	55273	1			
0617			31,3045	01167	1			2DEC
0617			31,3046	26361	0			
0618			31,3047	76520	1			2DEC
0618			31,3050	75267	0			
0619	REF	159	LAST	846	31,3051	24755	1	CAF
0620	REF	341	LAST	851	31,3052	54156	1	TS
0621			31,3053	00000	1			EXTEND
0622	REF	1			31,3054	33070	0	DOA
0623	REF	342	LAST	851	31,3055	52155	1	EXCH
0624	REF	76	LAST	851	31,3056	52132	0	EXCH
0625	REF	343	LAST	851	31,3057	31162	1	CA
0626	REF	8	LAST	851	31,3058	7212	0	TC
0627	REF	344	LAST	851	31,3061	52156	1	EXCH
0628	REF	345	LAST	851	31,3062	52155	1	EXCH
0629	REF	77	LAST	851	31,3063	52132	0	EXCH
0630	REF	346	LAST	851	31,3064	21155	1	DAS
0631	REF	144	LAST	846	31,3065	6042	1	TC
0632			31,3066	42476	0			DCCMF
0633			31,3067	00542	1			CLOG2/32
0633			31,3067	34414	1			2DEC

.0216608494

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0001				37,241			BANK	37	
0002	REF	1		37,242			SFTLCC	SFPV1	
0003				37,241			BANK		
0004	REF	40	LAST	836	37,1515		EPANK=	DVCNTR	
0005	***** PREPREAD *****								
0007									
0008	REF	1					CCOUNT*	11/SERV	
0009	REF	1	LAST	814	37,241	3 4757 0	PREREAD	CAF	SEVEN
0010	REF	1			37,3411	0 3527 1		TC	ONCEFAZ5
0011	REF	4	LAST	812	37,2412	3 5031		CAF	PIPT21
0012	REF	21	LAST	774	37,3413	7 5172 1		TC	MOVAC
0013	REF	5	LAST	325	37,1462			EPANK=	NRUX
0014	REF	1			37,3414	23671 1		2CADR	LASTETAS
0014	REF	1			37,3415	14063 1			
0015	REF	2	LAST	336	37,3416	0 3541 1	PIPTETAS	TC	PIPTASR +3
0016	CLEAR + READ PIPS LAST TIME IN FREE+P123 DC ACT DESTROY VALUE OF PIPTIME1								
0017	REF	19	LAST	829	37,3417	4 7113 1		CS	FLAGWRD7
0018	REF	1			37,342	7 4773 1		MASK	SUPER011
0019	REF	20	LAST	852	37,3421	26 1 3 1		ADS	FLAGWRD7
0020	REF	2	LAST	166	37,3422	4 4735 0		CS	DETRIT
0021	REF	21	LAST	817	37,3423	7 0076 1		MASK	FLAGWRD2
0022	REF	22	LAST	352	37,3424	54 176 1		TS	FLAGWRD2
0023	REF	17	LAST	831	37,3425	3 4751 0		CAF	FCUR
0025	REF	7	LAST	137	37,3426	55 256 0		TS	PIPAC
0029	REF	5	LAST	810	37,3427	3 7713 0		CAF	PXJ022
0029	REF	27	LAST	846	37,342	0 5115 0		TC	FINDVAC
0031	REF	41	LAST	852	37,1515			EPANK=	DVCNTR
0031	REF	2	LAST	242	37,1431	2463 1		2CADR	NORMLIZE
0031					37,3422	45 767 1			
0032	REF	55	LAST	824	37,3433	3 4752 0		CA	TAP
0033	REF	1			37,3434	0 3523 0	GREREAD	TC	ONCEFAZ5
0034	REF	4	LAST	788	37,3435	2 5000 1		CA	2SECS
0035	REF	8	LAST	814	37,3436	0 5224 0		TC	VARDelay

5.7 SECT TO SKIP LASTETAS AFTER
RESTART.

LC LAST CYRC COMPENSATION IN FREE FALL

CLEAR + READ PIPS LAST TIME IN FREE+P123
DC ACT DESTROY VALUE OF PIPTIME1SET V37FLAC AND AVECFLAG (BITS 5 AND 6
OF FLAGWRD7)

RESET PIPTFLAG

INITIALIZE DV MONITOR

TC FIRST ENTRY TO AVERAGE C.

5.2 SECT FOR REEREADAC AND NORMLIZE

WAIT TWO SECONDS FOR REEREADCS

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P0136 ***** READACCS *****
0038 RFF 1 37,3437 4 3535 1 READACCS CS OCT37771 THIS PIECE OF CODING ATTEMPTS TO
0039 RFF 2 LAST 22 37,344 6 3535 1 AD TIME5 SYNCHRONIZE READACCS WITH THE DIGITAL
0040 RFF 251 LAST 842 37,3441 1 3535 0 CCS A AUTOPILCT SO THAT A PAXIS RLPT WILL
0041 RFF 91 LAST 818 37,3442 4 4753 0 CS CNE OCCUR APPROXIMATELY 70 MILLISECONDS
0042 RFF 37,3443 1 3445 0 TCF #2 FOLLOWING THE READACCS RLPT. THE 70 MS
0043 RFF 92 LAST 852 37,3444 3 4753 1 CA CNE OFFSET WAS CHOSEN SO THAT THE PAXIS
0044 RFF 2 LAST 852 37,3445 24 037 0 +2 ADS TIME5 RLPT WOULD NOT OCCUR SIMULTANEOUSLY
AD045 WITH ANY OF THE 8 SUBSEQUENT R10,R11
AD046 INTERRUPTS -- THUS MINIMIZING THE POSS-
AD047 IBILITY OF LOSING DOWNRLPTS.

0048 RFF 3 LAST 852 37,3446 4 3535 1 TC PIPAS0 READ THE PIPAS.
0049 RFF 16 LAST 814 37,3447 3 4756 1 PIPSDONE CA FIVE
0050 RFF 2 LAST 852 37,345 0 3527 1 TC GNUMFAZES5
0051 RFF 52 LAST 852 37,3451 3 4753 1 PIPCS.5 CAF CNE
0052 RFF 2 LAST 852 37,3452 55 256 0 TS PIPAGE

0053 RFF 9 LAST 797 37,3453 3 4736 1 CA PRI02C
0054 RFF 38 LAST 852 37,3454 0 5125 1 TC FINEVOC
0055 RFF 42 LAST 852 37,3455 1 3515 0 FRANK= DVCNTR
0056 RFF 2 LAST 242 37,3455 22 6 1 2CAGR SERVICER SET UP SERVICER JOB
0056 37,3456 66 67 2

0057 RFF 21 LAST 737 37,3457 3 4743 0 CA RIT9
0058 37,3457 2 0116 1 EXTEND
0059 RFF 28 LAST 825 37,3461 6 011 1 WCF DSALNCLT TURN ON TEST CONNECTOR CUTEIT

0060 RFF 21 LAST 852 37,3462 3 0113 0 CA FLAGWRD7
0061 RFF 6 LAST 826 37,3463 7 4747 0 MASK AVECFEIT
0062 37,3464 0 3526 1 LXTEND
0063 RFF 1 37,3465 1 3515 1 BZF AVEGOUT AVEGFLAG DOWN - SET UP FINAL EXIT

0064 RFF 6 LAST 808 37,3466 3 0112 1 CA FLAGWRD6
0065 RFF 3 LAST 717 37,3467 7 4744 0 MASK MUMFLA0IT
0066 37,347 0 3536 1 EXTEND
0067 RFF 1 37,3471 1 3512 1 BZF MAKEACCS MUMFLAG CLEAR - BYPASS LP AND EISP.

0068 RFF 2 LAST 754 37,3472 10 754 0 CCS PHASE2
0069 RFF 7 LAST 853 37,3473 1 3513 1 TCF MAKEACCS PHASE 2 ACTIVATED - AVGIC MULTIPLE R10.

0070 RFF 11 LAST 852 37,3474 3 4757 0 CAF SEVEN
0071 RFF 4 LAST 823 37,3475 55 055 1 TS PIPCTR SET PIPCTR FOR 4X/SEC RATE.

0072 RFF 11 LAST 789 37,3476 4 0025 1 CS TIME1 SET TEASF2 .05 SECONDS IN THE PAST.
0073 RFF 17 LAST 853 37,3477 6 4756 1 AD FIVE
0074 RFF 2 LAST 221 37,3500 6 4734 0 AD NEG1/2
0075 RFF 3 LAST 852 37,3501 6 4724 0 AD NEG1/2
0076 RFF 3 LAST 477 37,3502 57 054 1 XCF TRASF2

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0077	REF	3	LAST	276	37,2512	3 4261 1	CAF	DEC17	2.21SFCT FOR R10,R11
0078	REF	135	LAST	826	37,2514	54 711 1	TS	L	
0079					37,2515	4 0000 0	CCM		
0080	REF	5	LAST	729	37,2516	52 754 0	EXCH	-PHASE2	
0081	REF	5	LAST	495	37,2507	3 6717 1	CAF	CCT24	FIRST R10,R11 IN .200 SECONDS.
0082	REF	25	LAST	752	37,2511	2 5212 0	TC	WAITLIST	
0083	REF	24	LAST	845	7,1516		FRANK=	UNIT/0/	
0084	REF	2	LAST	822	37,2511	52006 0	2CADR	R10,R11	
0085					37,2512	42767 0			
0086	REF	18	LAST	852	37,2513	3 4751 1	MAKEACCS	CA FOUR	
0086	REF	1			37,2514	1 3434 0	TCF	GEFACAX	CC PHASE CHANGE AND RECALL READACCS
0087					37,2515	0 1110 1	AVFGOUT	EXTEND	
0088	REF	1			37,2516	2 3534 0	TCF	AVOUTCAP	SET UP FINAL SERVICER EXIT
0089	REF	5	LAST	828	37,2517	53 252 1	EXCH	AVCXIT	
0090	REF	10	LAST	854	37,2521	3 4751 0	CA	FOUR	SET 5.4 SFCT FOR REREACAC AND SERVICER
0091	REF	2	LAST	852	37,2521	2523 0	TC	CAUTFAZ5	IF REREACAC IS CALLED, IT WILL EXIT
0092	REF	50	LAST	846	37,2522	5261 1	TC	TASKOVER	END TASK WITHOUT CALLING READACCS
0093	REF	136	LAST	854	37,2523	54 711 1	CAUTFAZ5	TS L	SAVE INFLT IN L
0094	REF	12	LAST	852	37,2524	4 0725 1	CS	TIME1	
0095	REF	1			37,2525	55 062 0	TS	TR/SLE	SET TRASE5
0096					37,2526	1 3531 0	TCF	+2	
0097	REF	137	LAST	854	37,2527	54 711 1	CAUTFAZ5	TS L	SAVE INFLT IN L
0098	REF	138	LAST	854	37,2531	4 0001 1	CS	L	-PHASE IN A, PHASE IN L
0099	REF	2	LAST	215	37,2531	52 762 0	EXCH	-PHASE5	SET -PHASE5,PHASE5
0100	REF	213	LAST	830	37,2532	0 0002 0	TC	C	
0101	REF	42	LAST	853	37,2515		FRANK=	DVCNTR	
0102	REF	1			37,2533	3661 0	AVOLTCAD	2CADR	AVCFER
0102	REF	1			37,2534	44767 0			
0104					37,2535	37771 1	CCT37771	CCT	37771
0105					33,2206		FRANK	32	
0106	REF	4	LAST	44	33,2200		SFTLCC	SERVICES	
0107					33,2206		PANK		
0108	REF	4	LAST	44 TC	45:	12 37*	CCOUNT*	68/585V	

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***** SERVICE *****										
P0119 *****										
P0111 *****										
0112	REF	72	LAST	847	33,2216	0 5353 1	SERVICE	TC	PHASCHAC	RESTART REFADAC + SERVICE
0113					33,2217	16335 0		OCT	16335	
0114					33,2218	20190 0		CCT	20111	
0115	REF	44	LAST	854	33,2219	0 7115 1		FRANK	PVCONT	
0116	REF	1			33,2211	0 2217 1		2CADR	GCTABVAL	
0117	REF	1			33,2212	60667 0				
0117	REF	2	LAST	797	33,2213	2 7721 1		CAF	PRICBI	INITIALIZE 1/PIPADT IN CASE RESTART HAS
0118	REF	7	LAST	337	33,2214	55174 1		TS	1/PIPADT	CAUSED LASTETAS TO BE SKIPPED.
0119	REF	225	LAST	847	33,2215	0 4616 1		TC	RANKCALL	FIFA COMPENSATION CALL
0120	REF	2	LAST	386	33,2216	15271 1		CADR	1/PIFA	
0121	REF	145	LAST	851	33,2217	0 6042 1	GCTABVAL	TC	INTERPT	
0122					33,2220	51575 1		VLCAD	ARVAL	
0123	REF	5	LAST	196	33,2221	77325 0			DELV	
0124					33,2222	77776 1		EXIT		
0125	REF	347	LAST	851	33,2223	3 1154 1		CA	VPAC	
0126	REF	4	LAST	786	33,2224	551245 1		TS	ABDELV	ABDELV = CM/SEC*2(-14).
0127					33,2225	0 0056 1		EXTEND		
0128	REF	1			33,2226	7 2020 0		MP	KPIP	
0129	REF	4	LAST	836	33,2227	531514 1		EXCH	ABDVCCNV	ABDVCCNV = M/CS *2(-5).
01292					33,2230	0 2076 1		EXTEND		
01294	REF	12	LAST	027	33,2231	3 1244 1		CCA	MASS1	
01296	REF	2	LAST	850	33,2232	531571 1		EXCH	MASS1	INITIALIZE MASS1 IN CASE WE SKIP MASSMON
0130	REF	14	LAST	843	33,2233	4 7114 1	MASSMON	CS	FLAGWDB	ARE WE ON THE SURFACE?
0131	REF	9	LAST	714	33,2234	7 4744 0		MASK	SUREFBIT	
0132					33,2235	0 0116 1		EXTEND		
0133	REF	1			33,2236	1 2254 1		BZF	MCNSFCI	YES: BYPASS MASS MESS
0134	REF	10	LAST	825	33,2237	2 0106 0		CA	FLWCRCID	NO: WHICH VFX SHOULD BE USED?
0135	REF	12	LAST	825	33,2240	7 4737 1		MASK	APSELBIT	
0136	REF	252	LAST	853	33,2241	17 000 0		CCS	A	
0137					33,2242	0 0006 1		EXTEND		IF EXTEND IS EXECUTED, APSVEX --> A,
0138	REF	3	LAST	834	33,2242	2 2001 1		CCA	APSVEX	OTHERWISE DESVEX --> A
0139	REF	214	LAST	854	33,2244	54 002 1		TS	0	
0140					33,2245	0 0006 1		EXTEND		
0141	REF	5	LAST	855	33,2246	2 1514 0		CCA	ABDVCCNV	
0142					33,2247	0 0106 1		EXTEND		
0143	REF	215	LAST	855	33,2250	10 002 1	CCT1002	PV	G	WHERE APPROPRIATE VFX RESIDES
0144					33,2251	0 0106 1		EXTEND		
0145	REF	12	LAST	855	33,2252	7 1243 1		MP	MASS	
0149	REF	4	LAST	855	33,2253	211571 1		DAS	MASS1	
0150	REF	3	LAST	812	33,2254	2 2021 0	MCNSPOT	CA	KPIP1	IF VPAC = ABDELV AT 2(14) CM/SEC
0151	REF	0	LAST	851	33,2255	0 7312 0		TC	SHORTAF	MULTIPLY BY KPIP1 TO GET

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0152	REF	348	LAST	855	33,2256	52 155 1	EXCF	MPAC	ABDELV AT 2(7) M/CS
0153	REF	6	LAST	725	33,2257	21'511 1	CAS	CVTCTAL	UPDATE CVTCTAL FOR DISPLAY
0156	REF	1			33,2261	0 2447 1	TC	TMPTCSPT	
0157	REF	226	LAST	855	33,2261	0 4616 1	TC	RANKCALL	
0158	REF	2	LAST	604	33,2262	47617 1	CADR	QLICTFIB	
0159	REF	1			33,2263	2 2414 1	CAD	XNAPIPAD	
0160	REF	237	LAST	856	33,2264	0 4616 1	TC	RANKCALL	
0161	REF	1			33,2265	20737 1	CADR	FLTSHPCT	
0166	REF	146	LAST	855	33,2266	0 6042 1	TC	INTPPT	
0167					33,2267	45014 0	AVCPACFC	BCN	CALL
0168	REF	6	LAST	821	33,2270	3377 0			MUNFLAG
0169	REF	1			33,2271	66771 0			OVPCIE
0171	REF	1			33,2272	66735 0			CALCRVC
0171					33,2273	77776 1	EXIT		
0172	REF	1			33,2274	0 3514 1	CCSERV	TC	QLIKFAZ5
0173	REF	1			33,2275	0 2422 1	COPYCYCL	TC	COPYCYC
0174	REF	2	LAST	811	33,2276	55'157 1	CA	ZERO	A IS ZERO ON RETURN FROM COPYCYC
0175	REF	2	LAST	811	33,2277	55'161 0	TS	PIPATMPX	STILL UNDER INFINT
0176	REF	2	LAST	811	33,2277	55'161 0	TS	PIPATMPY	
0177	REF	2	LAST	811	33,2300	55'161 1	TS	PIPATMPZ	
0178	REF	2	LAST	827	33,2301	4 4741 0	CS	STEEPRIT	CLEAR STEERSW PRIOR TO DVMDN.
0179	REF	23	LAST	852	33,2302	7 0076 1	MASK	FLAGWPD2	
0180	REF	24	LAST	856	33,2303	54 076 1	TS	FLAGWPD2	
0181	REF	3	LAST	755	33,2304	3 4745 0	CAD	IDLEPRIT	IS THE IDLE FLAG SET?
0182	REF	22	LAST	852	33,2305	7 01 3 1	MASK	FLAGWPD7	
0182	REF	252	LAST	855	33,2306	10 000 0	CCS	A	
0184	REF	1			33,2307	1 2342 1	TCF	NCDVMDN1	IDLEFLAG = 1, HENCE SET AUXFLAG TO 0.
0185	REF	7	LAST	853	33,2310	4 0112 0	CS	FLAGWPD6	
0186	REF	1			33,2311	7 4752 1	MASK	AUXFLPIT	
0187	REF	254	LAST	856	33,2312	10 000 0	CCS	A	
0188	REF	1			33,2313	1 2346 0	TCF	NCDVMDN2	AUXFLAG = 0, HENCE SET AUXFLAG TO 1.
0189	REF	7	LAST	831	33,2314	4 1257 0	DVMDN	CS	DVTHPLSH
0190	REF	5	LAST	855	33,2315	6 1245 0	AD	ABDELV	
0191					33,2316	0 000 1	EXTEND		
0192	REF	1			33,2317	5 2352 1	BZMF	LCTHRIST	
0193	REF	25	LAST	856	33,2320	4 0076 1	CS	FLAGWPD2	SET STEERSW.
0194	REF	2	LAST	856	33,2321	7 4741 1	MASK	STEEPRIT	
0195	REF	26	LAST	856	33,2322	26 076 1	ADS	FLAGWPD2	
0196	REF	34	LAST	852	33,2323	3 4753 1	CVCTNSTT	CAD	CAD
									ALLOW TWO PASSES MAXIMUM NOW THAT

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0107	REF	45	LAST	855	33,2324	55'515 0	TS	DVCNT	THRUST HAS BEEN DETECTED.
0108	REF	19	LAST	855	33,2325	3 116 0	CA	FLOWDET1	ERANCE IF APSFLAG IS SET.
0109	REF	13	LAST	855	33,2326	7 4737 1	MASK	APSELBIT	
0200	REF	255	LAST	856	33,2327	10 010 0	CCS	A	
0201	REF	1			33,2330	1 2375 0	TCF	USEJETS	

0202	REF	21	LAST	853	33,2331	3 4743 0	CA	BITS	CHECK GIMBAL FAIL BIT
0203					33,2332	0 016 1	EXTEND		
0204	REF	3	LAST	192	33,2333	02 032 1	PAND	CHAN32	
0205					33,2334	0 0005 1	EXTEND		
0206	REF	2	LAST	857	33,2335	1 2375 0	BZF	USEJETS	

0207	REF	2	LAST	753	33,2336	4 4736 0	USEJETS	CS	USEOPJTS
0208	REF	25	LAST	825	33,2337	7 1111 1	MASK	DAPBCCLS	
0209	REF	26	LAST	857	33,2340	54 111 1	TS	DAPBCCLS	
0210	REF	1			33,2341	1 241 0	TCF	SEPVOLUT	

0211	REF	2	LAST	856	33,2342	4 4752 1	ACDVMCN1	CS	AUXFLBIT	SET AUXFLAG TO 0.
0212	REF	8	LAST	856	33,2343	7 0102 0	MASK	FLAGWPD6		
0213	REF	9	LAST	857	33,2344	54 112 0	TS	FLAGWPD6		
0214	REF	3	LAST	857	33,2345	1 2375 0	TCF	USEJETS		
0215	REF	1	LAST	857	33,2346	4 112 0	ACDVMCN2	CS	FLAGWPD6	SET AUXFLAG TO 1.
0216	REF	3	LAST	857	33,2347	7 4752 1	MASK	AUXFLBIT		
0217	REF	11	LAST	857	33,2350	26 112 0	ADS	FLAGWPD6		
0218	REF	4	LAST	857	33,2351	1 2375 0	TCF	USEJETS		

0219	REF	2	LAST	856	33,2352	0 3514 1	LCIHPCLST	TC	QLIKFA25	
0220	REF	46	LAST	857	33,2353	11'515 0	CCS	DVCNTR		
0221	REF	1			33,2354	1 2366 1	TCF	DVCNTR		

0222	REF	1			33,2355	10 76 1	CCS	PHASE4	CONFAIL JOB ACTIVE?
02222	REF	2	LAST	857	33,2356	1 240 0	TCF	SEPVOLUT	YES - WON'T NEED ANOTHER.

02224	REF	72	LAST	855	33,2357	5353 1	TC	PHASCHNO	4.375PCT FOR CONFAIL.
02226					33,2360	00374 1	DCT	DC374	

02228	REF	4	LAST	716	33,2361	3 7716 0	CAF	PRIC25	
0223	REF	22	LAST	852	33,2362	7 5072 1	TC	NOVAC	
02232	REF	30	LAST	846	57,1455		FRANK=	WHICH	
02234	REF	2	LAST	242	33,2363	02575 1	2CADF	CONFAIL	
02234					33,2364	74057 0			
02236	REF	3	LAST	857	33,2365	1 240 0	TCF	SEPVOLUT	

0224	REF	1			33,2366	55'570 0	DECCNTR	TS	DVCNTR1
0225	REF	3	LAST	857	33,2367	0 3514 1	TC	QLIKFA25	
0226	REF	2	LAST	857	33,2370	2 1570 1	CA	DVCNTR41	
0227	REF	47	LAST	857	33,2371	55'515 0	TS	DVCNTR	
0228					33,2372	0 2036 0	INFINT		

0229	REF	45	LAST	847	33,2373	1 4674 0	TC	IBAPCALL	IF THPLST IS LOW, NO STEERING IS DONE
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0230	REF	7	LAST	844	22,2374	40155 1	USJETS	CAFR	STORATE	AND THE DESIRED RATES ARE SET TO 2FEF.
0231	REF	27	LAST	857	22,2375	40111 1	USJETS	CS	DAPRCLS	
0232	REF	3	LAST	857	22,2376	7 4736 0		MASK	USEGJTS	
0233	REF	28	LAST	858	22,2377	26 111 1		ACS	DAPRCLS	
0234					22,2400	0 0000 1	SERVCUT	RFLINT		
0235	REF	238	LAST	856	22,2401	7 4616 1		TC	BANKCALL	
0236	REF	1			22,2402	40462 1		CAFR	T/ACCS	
0239	REF	11	LAST	260	22,2403	3 167 1		CA	PRIORITY	
0240	REF	8	LAST	432	22,2404	7 5004 1		MASK	LCW9	
0241	REF	8	LAST	800	22,2405	54 166 1		TS	PUSHLOC	
0242					22,2406	22 007 0		ZL		
0243	REF	25	LAST	810	22,2407	52 121 1		EXCH	FIXLOC	FIXLOC AND CVFIND
0244	REF	4	LAST	857	22,2410	0 2514 1		TC	QUICKFMS	
0245					22,2411	7 0005 1		EXTEND		
0246	REF	6	LAST	864	22,2412	2 1252 0		CCA	AVGEXIT	EXIT TO SELECTED ROUTINE WHETHER THERE IS TRUST OR NOT. THE STATE OF STEERS WILL CONVEY THIS INFORMATION.
0247	REF	21	LAST	748	22,2413	52 006 0		DXCH	Z	
02476	REF	7	LAST	844	22,2414	0 2145 0	XNBPFAE	ECADR	XNBPFAE	
0248					22,2761			BANK	32	
0249	REF	1			22,2762			SETLOC	SFFV2	
0250					22,2763			BANK		
0251	REF	1						CCLNT#	33/SERV	
0252	REF	10	LAST	845	22,2764	2 1234 0	AVGFAC	CA	PIPTIME +1	FINAL AVERAGE G EXIT
0253	REF	8	LAST	855	22,2765	55 0074 1		TS	1/PIPTIME	SET UP FREE FALL CYCLE COMPENSATION.
0254	REF	56	LAST	846	22,2766	0 5504 0		TC	UPFLAG	SET DRIFT FLAG.
0255	REF	1			22,2767	0 0036 1		ADRES	DRIFTFLG	
0256	REF	239	LAST	858	22,2768	0 4616 1		TC	BANKCALL	
0257	REF	1			22,2769	17 012 0		CAFR	PIPERFF	
0258	REF	22	LAST	857	22,2770	4 4742 1		CS	BIT9	
0259					22,2771	0 0006 1		EXTEND		
0260	REF	29	LAST	863	22,2772	03 011 1		WAND	DSALMOUT	
0261	REF	10	LAST	795	22,2773	0 5327 1		TC	2PHSCNAG	
0262					22,2774	00005 1		CCT	5	GROUP 5 OFF
0263					22,2775	05 022 1		CCT	05022	GROUP 2 ON
0264					22,2776	20000 0		CCT	20000	
0265	REF	147	LAST	856	22,2777	0 6142 1		TC	INTERPT	
0266					22,2778	43014 0		SET	CLEAR	
0267	REF	2	LAST	843	22,2779	01464 0			NCH24FLG	SHLT OFF R29 WHEN SERVICER ENDS.
0268	REF	1			22,2780	03664 0			SWANDISP	SHLT OFF R10 WHEN SERVICER ENDS.
0269					22,2781	45014 0		CLEAR	CALL	RESET MUNFLAC.
0270	REF	7	LAST	850	22,2782	03267 1			MUNFLAC	

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0271	REF	1		22, 27.4	27445 C		AVETCMID
0272				22, 27.15	77414	CLEAR	EXIT
0273	REF	1		22, 27.15	03571.1		V37FLAC
0274	REF	52	LAST 847	22, 27.17	C 4625 C	AVETRA	TC
0275	REF	1		22, 27.11	10116 D	CAED	V37PFT
0276	REF	1		22, 27.17		CLTCGAVE =	AVETRA
0277	REF	5	LAST 855	27, 157.0		CVCTRL =	MASS1

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P027P

02782 REF 1 27,20000 SETLOC SERV3
 02784 27,2321 BANK
 02786 REF 1 COUNT* 11/SERV

0279 27,2321 0 0 6 1 SERVICE EXTEND DISCONNECT SERVICER FROM ALL GUIDANCE
 0297 REF 1 27,2322 3 3357 1 DCA SVEXTADR
 0281 REF 7 LAST 856 27,2323 53 252 1 EXCH AVCEXIT

0282 REF 22 LAST 856 27,2324 4 103 1 CS FLAGWRD7 DISCONNECT THE DELTA-V MONITOR
 0283 REF 4 LAST 856 27,2325 7 4745 1 MASK IDLEBIT
 0284 REF 24 LAST 861 27,2326 26 103 1 ADS FLAGWRD7

0285 REF 5 LAST 825 27,2327 3 4735 1 CAF LBYBIT TERMINATE R12 IF RUNNING.
 0286 REF 10 LAST 825 27,233 54 107 0 TS FLAGWRD11

0287 27,2331 0 0006 1 EXTEND
 0288 REF 15 LAST 807 27,2332 3 4755 1 DCA NEG
 0289 REF 4 LAST 725 27,2333 52 752 1 EXCH -PHASE1

0290 REF 12 LAST 857 27,2334 3 0112 1 CA FLAGWRD6 DO NOT TURN OFF PHASE 2 IF MONFLAC SET.
 0291 REF 4 LAST 853 27,2335 7 4744 0 MASK MLNFBIT
 0292 REF 256 LAST 857 27,2336 10 000 0 CCS A
 0293 27,2337 1 3243 1 TCF +4

0294 27,2340 2 0016 1 EXTEND
 0295 REF 16 LAST 840 27,2341 3 4755 1 DCA NEG
 0296 REF 6 LAST 854 27,2342 52 754 0 EXCH -PHASE2

0297 27,2343 0 0016 1 +4 EXTEND
 0298 REF 17 LAST 840 27,2344 3 4755 1 DCA NEG
 0299 REF 4 LAST 817 27,2345 52 756 1 EXCH -PHASE3

0300 27,2346 0 0016 1 EXTEND
 0301 REF 18 LAST 840 27,2347 3 4755 1 DCA NEG
 0302 REF 3 LAST 776 27,2350 52 764 0 EXCH -PHASE6

0303 REF 2 LAST 225 27,2351 3 4754 0 CAF OCT33 4.33SPCT FOR CORRECTION
 0304 REF 130 LAST 854 27,2352 54 001 1 TS L
 0305 27,2353 4 0011 1 CCN
 0306 REF 8 LAST 826 27,2354 52 760 1 EXCH -PHASE4

0307 REF 1 27,2355 1 5634 1 TCF WHIMPER PERFORM A SOFTWARE RESTART AND PROCEED
 A0308 TO GCTCPOH WHILE SERVICER CONTINUES TO
 A0309 RUN, ALBEIT IN A GROUND STATE WHERE
 A0310 ONLY STATE-VECTOR DEPENDENT FLACTIONS
 A0311 ARE MAINTAINED.

0312 REF 49 LAST 857 27,2355 FRANK= DVCMTH

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0313 REF 7 LAST 826 27,3356 03761 1 SELECTADR 20400 SERPVEXIT
 0313 27,3357 64767 1

0314 32,3761 BANK 32

0316 REF 1 32,2000 SETLCC SERPV

0316 32,4761 BANK

0317 REF 1 COUNT* 44/SRPV

0318 REF 74 LAST 857 32,3761 5352 1 SERPVEXIT TC PHASCHAG

0319 32,3762 1035 1 CCT DIB35

0320 REF 122 LAST 842 32,3762 1 5155 1 TCF ENDCEJCE

0321 23,2463 BANK 23

0322 REF 1 23,2464 SETLCC ACPLIZ

0323 23,2462 BANK

0324 REF 1 COUNT* 44/SRPV

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P1325. NORMLIZE AND COPYCYCL

0326	REF	148	LAST	REF	23,2462	C 6042 1	NORMLIZE	IC	INTERP	
0327					23,2464	43175 0		VLOAD	RFF	
0328	REF	2	LAST	REF	23,2465	03545 0			RNI	
0329	REF	8	LAST	REF	23,2466	03347 1			MLAFLG	
0330	REF	1			23,2467	66415 1			NORMLIZ1	
0331					23,2471	64252 0		VSL6	MXV	
0332	REF	32	LAST	REF	23,2471	11724 0			REFSMAT	
0333	REF	21	LAST	REF	23,2472	37521 0		STCALL	R	
0334	REF	4	LAST	REF	23,2472	67067 1			MLNGRAV	
0335					23,2474	76575 1		VLOAD	VSL1	
0336	REF	4	LAST	REF	23,2475	03553 1			VNI	
0337					23,2476	77721 0		MXV		
0338	REF	33	LAST	REF	23,2477	11734 0			REFSMAT	
0339	REF	12	LAST	REF	23,25	27577 1		STCVL	V	
0340	REF	4	LAST	REF	23,25 1	11726 0			V(CSM)	
0341					23,25 2	53435 0		VXV	UNIT	
0342	REF	5	LAST	REF	23,25 3	01720 0			R(CSM)	
0343	REF	3	LAST	REF	23,25 4	10727 1		STORE	UHYP	
0344					23,25 5	77773 1	ASCSPCT	EXIT		
0345					23,25 6	00006 1		EXTEND		MAKE SUFF GROUP 2 IS OFF.
0346	REF	19	LAST	REF	23,25 7	3 4755 1		DCA	NEG1	
0347	REF	7	LAST	REF	23,25 10	52 754 0		EXCF	-PHASE2	
0348	REF	54	LAST	REF	23,25 11	2 4635 0		IC	PCSTJUMP	
03482	REF	1			23,25 12	65423 1		CADR	NORMLIZ2	
03483					23,2415			BANK	33	
03484	REF	5	LAST	REF	23,2			SETLOC	SERVICES	
03485					23,2415			BANK		
03486	REF	5	LAST	REF	23,2415	135 172*		COUNT*	\$1/SERV	
0349					23,2415	77424 1		NORMLIZ1	CALL	
0349	REF	1			23,2416	66667 0			CALCGRV	
0351					23,2417	77776 1		EXIT		
0352	REF	1			23,242	3 2437 1		NORMLIZ2	CA	LIGHTPEN
0353	REF	2	LAST	REF	23,2421	0 2424 1		IC	COPYCYC +1	DO NOT COPY MASS IN NORMLIZE
0354	REF	133	LAST	REF	23,2422	5155 0		IC	ENDOFJFB	
0355	REF	6	LAST	REF	23,2423	3 6037 0		COPYCYC	CA	REF24
0356					23,2424	0 0004 0		+1	INHINT	REC 20
0357	REF	4	LAST	REF	23,2425	7 7752 1		+2	MASK	REDUCE BY 1 IF CDD
0358	REF	21	LAST	REF	23,2426	54 061 1		IS	ITEMP1	
0359					23,2427	1 0006 1		EXTEND		
0360	REF	32	LAST	REF	23,2430	5 1161 0		INDEX	ITEMP1	
0361	REF	4	LAST	REF	23,2431	3 1845 1		DCA	RNI	
0362	REF	33	LAST	REF	23,2432	51 061 1		INDEX	ITEMP1	

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0363	PFF	12	LAST	784	23,2422	521220 1	DXCH	RA
0364	PFF	34	LAST	862	32,2434	10 161 1	CCS	IT: IP1
0365	PFF	3	LAST	862	32,2435	1 2425 1	TCF	CCFYCYC +2
0366	PFF	216	LAST	865	22,2436	1 2422	TC	C

RETURN UNDER INHINT

0367 32,2437 07222 1 EIGHTEEN DEC 1E

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P0368 ***** PIP/ READER *****

R0369 PAGE NO. 10 BY D. LICKLY DEC. 5 1966

P0370 FUNCTIONAL DESCRIPTION

R0371 SUPPLEMENT TO READ PIPA COUNTERS, TRYING TO BE VERY CAREFUL SO THAT IT WILL BE RESTARTABLE.
 R0373 PIPA READINGS ARE STORED IN THE VECTOR DELV. THE HIGH ORDER PART OF EACH COMPONENT CONTAINS THE PIP/ READING,
 P0375 RESTARTS BEGIN AT REPI/DAC.

R0376 AT THE END OF THE PIPA READER THE CDS ARE READ AND STORED AS A
 R0377 VECTOR IN COUTEMP. THE HIGH ORDER PART OF EACH COMPONENT CONTAINS
 R0378 THE CDS READING IN 28 FORM IN THE CDSX, Y, Z. THE THRUST
 R0379 VECTOR ESTIMATOR IN FINDER/REQUIRES THE CDS BE READ AT PIPTIME.

R0380 CALLING SEQUENCE AND EXIT

R0381 CALL VIA TC, ISWCALL, ETC.

R0382 EXIT IS VIA C.

P0383

R0384 INPUT

R0385 INPUT IS THROUGH THE COUNTERS PIPAX, PIPAY, PIPAZ, AND TIME2.

R0386 OUTPUT

R0387 HIGH ORDER COMPONENTS OF THE VECTOR DELV CONTAIN THE PIPA READINGS.
 R0388 PIPTIME CONTAINS TIME OF PIPA READING.

R0389 PERIS (FEASIBLE LOCATIONS DESTROYED BY PROGRAM)

R0390 TEMX TEMY TEMZ PIPAGE

1391				37,2536	BANK 37
0392	RFF	2	LAST	852	37,2536
0393				37,3536	SFTLOC SEFV1
					BANK

1394	RFF	2	LAST	852	TC	854:	86	86*	CCLNT* 88/SEFV
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0395				37,3536	PIPIP	1	PIPASR	EXTEND
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0396	REF	26	LAST	825	37,3537	3 0025 0	CCA	TIME2		
0397	REF	8	LAST	795	37,3540	53'561 0	EXCF	PIPTIME1		
0398	REF	159	LAST	851	37,3541	4 4755 0	+3 CS	ZERO		CURRENT TIME POSITIVE VALUE INITIALIZE THESE AT NEG. ZERO.
0399	REF	5	LAST	811	37,3542	55'253 0	TS	TFMX		
0400	REF	4	LAST	811	37,3543	55'254 1	TS	TFMY		
0401	REF	4	LAST	811	37,3544	55'255 0	TS	TFMZ		

0402	REF	161	LAST	865	37,3545	3 4755 1	CA	ZERO		
0403	REF	4	LAST	385	37,3546	54 330 1	TS	DELVZ		
0403I	REF	5	LAST	865	37,3547	54 331 1	TS	DELVZ +1		
0404	REF	5	LAST	385	37,3551	54 326 1	TS	DELVY		
0404I	REF	6	LAST	865	37,3551	54 327 0	TS	DELVY +1		
04042	REF	9	LAST	386	37,3552	54 325 1	TS	DELVX +1		
0405	REF	4	LAST	853	37,3553	55'256 0	TS	PIPAGF		SHOW PIPA READING IN PROGRESS

0406					37,3554	0 0026 1	REPIPI	EXTEND		
0407	REF	9	LAST	811	37,3555	4 0041 1	DCS	PIPA X		X AND Y PIPS READ
0408	REF	6	LAST	865	37,3556	53'254 1	EXCF	TFMX		
0409	REF	10	LAST	865	37,3557	52 040 1	EXCF	PIPA X		PIPAS SET TO NEG ZERO AS READ.
0410	REF	10	LAST	865	37,3561	54 324 0	TS	DELVX		
0411	REF	7	LAST	865	37,3561	22 326 0	EXCF	DELVY		

0412	REF	4	LAST	811	37,3562	4 0041 0	REPIPI	CS	PIPAZ	REPEAT PROCESS FOR 7 PIP
0413	REF	5	LAST	865	37,3563	57'255 1	XCF	TFMZ		
0414	REF	5	LAST	865	37,3564	56 041 1	XCF	PIPAZ		
0415	REF	6	LAST	865	37,3565	54 330 0	DDDELVZ	TS	DELV7	

0416					37,3566	0 0006 1	REPIPI	EXTEND		COMPUTE GUIDANCE PERIOD
0417	REF	5	LAST	865	37,3567	2 1561 1	CCA	PIPTIME1		
0418	REF	2	LAST	105	37,3570	53'247 0	EXCF	PGUIDE		
0419					37,3571	0 0006 1		EXTEND		
0420	REF	20	LAST	858	37,3572	4 1234 1	DCS	PIPTIME		
0421	REF	3	LAST	865	37,3573	21'247 0	CAS	PGUIDE		

0422	REF	12	LAST	609	37,3574	2 0032 0	CA	CCUX		READ CCUS INTO HIGH ORDER COUNTS
0423	REF	1			37,3575	55'154 1	TS	CDLTEMPX		
0424	REF	5	LAST	609	37,3576	3 0033 1	CA	CCUY		
0425	REF	1			37,3577	55'155 0	TS	CDLTEMPY		
0426	REF	7	LAST	609	37,3578	3 0034 0	CA	CCUZ		
0427	REF	1			37,3579	55'156 0	TS	CDLTEMPZ		
0428	REF	11	LAST	865	37,3582	2 0324 1	CA	DELVX		
0429	REF	3	LAST	856	37,3583	55'157 1	TS	PIPATMPX		
0430	REF	8	LAST	865	37,3584	3 0326 0	CA	DELVY		
0431	REF	3	LAST	856	37,3585	55'160 0	TS	PIPATMPY		
0432	REF	7	LAST	865	37,3586	3 0330 1	CA	DELVZ		
0433	REF	3	LAST	856	37,3587	55'161 1	TS	PIPATMPZ		

0434	REF	217	LAST	863	37,3588	0 0032 0	TC	Q		
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0435	REF	5	LAST	865	37,3611	11'256 0	PERFACAC	CCS	PIPAGE	PIP READING NOT STARTED. GO TO BEGINNING
0436	REF	1			37,3612	1 3437 0		TCF	READACCS	
0437	REF	1			37,3613	3 3651 0		CAF	DCNEADR	SFT UP RETURN FROM PIPASR
0438	REF	218	LAST	865	37,3614	54 102 1		TS	G	
0439	REF	8	LAST	865	37,3615	10 330 0		CCS	DELVZ	Z DONE, CC CC CCUS Z NOT DONE, CHECK Y.
0440	REF	1			37,3616	1 3566 0		TCF	REFIP4	
0441					37,3617	1 3622 0		TCF	+3	
0442	REF	2	LAST	866	37,3620	1 3566 0		TCF	REFIP4	
0443	REF	3	LAST	866	37,3621	1 3566 0		TCF	REFIP4	
0444					37,3622	22 007 0		ZL		
0445	REF	9	LAST	865	37,3623	10 326 1		CCS	DELVY	
0446					37,3624	1 3627 0		TCF	+3	
0447	REF	1			37,3625	1 3636 0		TCF	CHKTEMX	Y NOT DONE, CHECK Y.
0448					37,3626	1 3627 0		TCF	+1	
0449	REF	6	LAST	865	37,3627	22 041 1		LXCH	PIPAZ	Y DONE, ZERO Z PIP.
0450	REF	6	LAST	865	37,3630	11'255 0		CCS	TEMZ	TEMZ NOT = -0, CONTAINS -PIPAZ VALUE.
0451	REF	7	LAST	866	37,3631	4 1255 0		CS	TEMZ	
0452	REF	1			37,3632	1 3565 0		TCF	DCDELVZ	TEMZ = -0, L HAS ZPIP VALUE.
0453					37,3633	1 3631 1		TCF	-2	
0454	REF	9	LAST	866	37,3634	22 330 1		LXCH	DELVZ	
0455	REF	4	LAST	866	37,3635	1 3566 0		TCF	REFIP4	
0456	REF	7	LAST	865	37,3636	11'253 0	CHKTEMX	CCS	TEMX	HAS THIS CHANGED
0457	REF	8	LAST	866	37,3637	4 1253 0		CS	TEMX	YES
0458					37,3640	1 3643 1		TCF	+3	YES
0459					37,3641	1 3627 1		TCF	-2	YES
0460	REF	1			37,3642	1 3554 1		TCF	REFIP1	NO
0461	REF	12	LAST	865	37,3643	54 324 0		TS	DELVX	
0462	REF	5	LAST	865	37,3644	4 1254 1		CS	TEMY	
0463	REF	1	LAST	866	37,3645	54 326 1		TS	DELVY	
0464	REF	161	LAST	865	37,3646	4 4755 0		CS	ZERC	ZERC X AND Y PIPS
0465	REF	11	LAST	865	37,3647	52 140 1		LXCH	PIPAX	L STILL ZERC FROM ABOVE
0466	REF	1			37,3650	1 3562 1		TCF	REFIP3	
0467	REF	1			37,3651	03447 0	CONFADR	CONFADR	PIPSDCNE	

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0468 33,2440 BANK 33
 0469 REF 6 LAST 862 33,2440 SETLCC SERVICES
 0470 33,2440 BANK

0471 REF 6 LAST 862 TO 864: 19 191* COUNT* \$\$/SEPV

0472 REF 2 LAST 865 33,2441 3 1155 1 TMPTOSPT CA CDUTEMPY THIS SUBROUTINE, CALLED BY AN RTB FROM
 0473 REF 1 33,2441 54 765 1 TS CDUSPCTY INTERPRETIVE, LOADS THE CCUS CORRESPON-
 0474 REF 2 LAST 865 33,2442 3 1156 1 CA CDUTEMPZ DING TO FIFTE INTO THE CCUSPCT VECTOR.
 0475 REF 1 33,2443 54 767 0 TS CDUSPCTZ
 0476 REF 2 LAST 865 33,2444 3 1154 0 CA CDUTEMFX
 0477 REF 1 33,2445 54 771 1 TS CDUSPCTX
 0478 REF 219 LAST 866 33,2446 0 0102 0 TC C

R0479 LRPTASK IS A WAITLIST TASK SET BY READACCS DURING THE DESCENT BRAKING
 R0480 PHASE WHEN THE ALT TO THE LUNAR SURFACE IS LESS THAN 25,000 FT. THIS
 R0481 TASK CLEARS THE ALTITUDE MEASUREMENT MADE DISCRETE AND INITIATES THE
 R0482 LANDING RADAR MEASUREMENT JOB (LRHJOB) TO TAKE A ALTITUDE MEASUREMENT
 R0483 50 MS PRIOR TO THE NEXT READACCS TASK.

0484 21,2125 BANK 21
 0485 REF 2 LAST 42 21,2125 SETLCC R11
 0486 21,2125 BANK

0487 REF I COUNT* \$\$/SEPV

0488 REF 11 LAST 866 21,2125 4 0107 0 LRPTASK CS FLGWRD11
 0489 REF 6 LAST 866 21,2126 7 4725 0 MASK LREYBIT
 0490 21,2127 0 0006 1 EXTEND
 0491 REF 1 21,2130 1 2141 0 BZF GRP2OFF LR BYPASS SFT - BYPASS ALL LR READING.

0496 REF 12 LAST 867 21,2131 4 0107 0 CS FLGWRD11
 0497 REF 1 21,2132 7 4742 0 MASK NOIRRPIT IS LR READ INHIBITED?
 0498 21,2133 0 0006 1 EXTEND
 0499 REF 2 LAST 867 21,2134 1 2141 0 BZF GRP2OFF YES. BYPASS LR READ.

0500 REF 1 21,2135 3 7723 0 CA PR1032 LR READ OK SET JOB TO DO IT
 0501 REF 23 LAST 867 21,2136 0 5072 1 TC NCVAC ABOUT 50 MS PRIOR TO PIPA READ
 0502 REF 4 LAST 236 57,1654 EBANK= HMTAS
 0503 REF 1 21,2137 03571 1 ZCADR LRHJOB
 0504 REF 1 21,2140 70067 1 GRP2OFF EXTEND
 0505 21,2141 0 0006 1
 0505 REF 20 LAST 862 21,2142 3 4755 1 ECA NEG0
 0506 REF 8 LAST 862 21,2143 52 754 1 EXCH -PHASE2
 0507 REF 1 21,2144 1 2021 1 TCF R1C,R11A

0508 33,2447 BANK 33
 0509 REF 7 LAST 867 33,2447 SETLCC SERVICES
 0510 33,2447 BANK

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0511 REF 7 LAST 867 TC 867: 7 198* CCNT# 54/SEPV
 R0512 HIGATASK IS ENTERED APPROXIMATELY 6 SECS PRIOR TO HIGATE DURING THE
 R0513 RESCEND PHASE. HIGATASK SETS THE HIGATE FLAG (BIT11) AND THE LR INHIBIT
 R0514 FLAG (BIT1) IN LRSTAT. THE HIGATJCR IS SET UP TO REPOSITION THE LR
 R0515 ANTENNA FROM POSITION 1 TO POSITION 2. IF THE REPOSITIONING IS
 R0516 SUCCESSFUL THE ALT BEAM AND VELOCITY BEAMS ARE TRANSFERRED TO THE NEW
 R0517 ORIENTATION IN AN COORDINATES AND STORED IN ERASABLE.

0518	REF	75	LAST	861	33,2447	0 5353 1	HIGATASK TC	PHASCHNG
0519					33,245	00051 0	CCT	51
0520	REF	2	LAST	867	33,2451	3 7723 0	CA	PRIC32
0521	REF	39	LAST	862	33,2452	0 5105 0	TC	FINCVAC
0522	REF	5	LAST	867	37,1654		FRANK=	HMEAS
0523	REF	1			33,2453	03636 1	2CACR	HIGATJCR
0523	REF	1			33,2454	66067 0		
0524	REF	13	LAST	867	33,2455	4 0107 0	CS	FLGWRD11
0525	REF	11	LAST	706	33,2456	7 5015 1	MASK	PRIC3
0526	REF	14	LAST	868	33,2457	26 107 0	ADS	FLGWRD11
0527	REF	1			33,2460	1 2546 0	TCF	CCNTSEPV +1

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P0528 MUNRETRN IS THE RETURN LOG FROM SPECIAL AVE G ROUTINE (MUNRVE)

0529 33,2461 77776 1 MUNRETRN EXIT

0530 RFF 15 LAST 868 33,2462 4 0107 0 CS FLGWRD11

0531 RFF 7 LAST 867 33,2463 7 4725 0 MASK LFFYBIT

0532 33,2464 0 0006 1 EXTEND

0533 RFF 1 33,2465 1 2551 0 BZF CCPYCYC1 BYPASS LP LOGIC IF BIT15 IS SET.

0534 RFF 16 LAST 869 33,2466 4 0107 0 CS FLGWRD11

0535 RFF 1 33,2467 7 4743 1 MASK XCRFIBIT

0536 33,2470 0 0006 1 EXTEND

0537 RFF 1 33,2471 1 2506 1 BZF R12

0538 33,2472 0 0006 1 30KCHK EXTEND

0539 RFF 1 33,2473 3 3115 1 DCA 1-30KFT

0540 RFF 349 LAST 866 33,2474 52 155 1 DCH MPAC

0541 33,2475 0 0006 1 EXTEND

0542 RFF 2 LAST 316 33,2476 3 1535 0 DCA HCALC

05425 RFF 350 LAST 869 33,2477 20 155 1 DAS MPAC

0543 RFF 257 LAST 860 33,2500 10 0000 0 CCS A

05435 RFF 2 LAST 869 33,2501 1 2506 1 TCF R12

0544 RFF 57 LAST 858 33,2502 0 5504 0 TC URFLAG

05445 RFF 7 LAST 845 33,2503 0 0011 1 ADRES XCVINFLG

0545 RFF 58 LAST 869 33,2504 0 5504 0 TC URFLAG

05455 RFF 1 33,2505 0 00253 0 ADRES XCRFLG

0546 RFF 17 LAST 869 33,2506 4 0107 0 R12 CS FLGWRD11

05463 RFF 2 LAST 867 33,2507 7 4742 0 MASK NC1RRBIT

05465 33,2510 0 0006 1 EXTEND

0547 RFF 2 LAST 868 33,2511 1 2545 0 BZF CCATSEPV

0548 RFF 18 LAST 869 33,2512 4 0107 0 CS FLGWRD11

0549 RFF 1 33,2513 7 4751 1 MASK NC511BIT

0550 33,2514 0 0006 1 EXTEND

0552 RFF 1 33,2515 1 3117 1 BZF UPDATCHK IF NO511BIT SET, DO NOT CHECK CR POSITION

0553 RFF 19 LAST 860 33,2516 4 0107 0 HITEST CS FLGWRD11

0554 RFF 1 33,2517 7 4741 0 MASK PSTHIBIT

0555 33,2520 0 0006 1 EXTEND

0556 RFF 1 33,2521 1 2540 0 BZF PCS2CHK

0557 RFF 20 LAST 820 33,2522 3 1642 0 HIGATCHK CA TTF/E

0558 RFF 1 33,2523 6 1427 1 AC RPTTIME

0559 33,2524 0 0006 1 EXTEND

0560 RFF 1 33,2525 6 2536 0 BZMF POSCHK NO

0561 RFF 3 LAST 280 33,2526 3 4741 1 CA EBANK4

0562 RFF 35 LAST 845 33,2527 56 003 1 XCH EBANK

0563 RFF 140 LAST 860 33,2530 54 001 1 TS L

MUST SWITCH EBANKS

SAVE IN L

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0563F	REF	8	LAST	85R	F4,1545			EBANK=	XNRPIP	
0564	REF	9	LAST	87C	33,2531	4 1545 0		CS	XNRPIP	UXXP IN GSOP CH5
05640F	REF	49	LAST	86C	07,151F			EBANK=	DVCNTR	
05641	REF	36	LAST	86S	33,2532	22 002 1		LXCF	EBANK	RESTORE EBANK
05642	REF	1			33,2532	6 1430 1		AD	REFC7GSW	GSW - UXEXP
05643					33,2534	0 0006 1		EXTEND		
05644	REF	1			33,253F	6 2447 1		BZMF	PIEATASK	IF LXEXP > GSW, THEN REFCSTITION
0565	REF	44	LAST	81C	33,2536	3 4746 0	PCS1CHK	CAF	BIT6	
0566					33,2537	1 2541 1		TCF	+2	
0567	REF	26	LAST	816	33,2540	3 4745 0	PCS2CHK	CAF	BIT7	
0568	REF	1			33,2541	1 3676 0		TC	POSTST	
0569	REF	2	LAST	86S	33,2542	1 3117 1		TCF	UPDATCHK	LR IN RIGHT POSITION - CONTINUE
0570	REF	34	LAST	82D	33,2543	0 5547 0	LPPCSALM	TC	ALARM	LR NOT IN PROPER POS-ALARM-BYPASS UPDATE
0571					33,2544	0 0511 1		CCT	511	AND CONTINUE SERVICER
0572					33,2545	0 0004 0	CCNTSERV	INFINT		
0573	REF	1			33,2546	4 3113 0		CS	BITS4-7	
0574	REF	20	LAST	86S	33,2547	7 0107 0		MASK	FLGWRD11	CLEAR LR MEASUREMENT FACE DISCRETES.
0575	REF	21	LAST	87C	33,2550	54 107 0		TS	FLGWPC11	

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0620	REF	5	LAST	871	33,2624	03601 0		VIS	
0621					33,2625	62552 0	SL1	OSC	
0622					33,2626	77671 1	PDV		
0623					33,2627	47175 0	EMPR	RTB	
0624	REF	1			33,2630	26130 0		ARCONVI	
0625	REF	4	LAST	871	33,2631	21613 0		SGNAGREE	
0626					33,2632	77776 1	CCPYCYC2	EXIT	LEAVE ALTITUDE RATE COMPENSATION IN MPAC
0627					33,2633	0 0004 0		INHINT	
0628	REF	27	LAST	871	33,2634	3 1536 0	CA	UNIT/R/	UPDATE PLUNIT FOR R10.
0629	REF	3	LAST	152	33,2635	55'743 1	TS	RLUNIT	
0630	REF	23	LAST	872	33,2636	3 1540 1	CA	UNIT/R/ +2	
0631	REF	4	LAST	872	33,2637	55'744 0	TS	RLUNIT +1	
0632	REF	29	LAST	872	33,2640	3 1542 0	CA	UNIT/R/ +4	
0633	REF	5	LAST	872	33,2641	55'745 1	TS	RUNIT +2	
0634	REF	351	LAST	869	33,2642	3 0154 1	CA	MEAC	LOAD NEW DALTRATE FOR R10.
0635	REF	2	LAST	152	33,2643	55'716 1	TS	DALTRATE	
0636					33,2644	0 0006 1		EXTEND	
0637	REF	4	LAST	871	33,2645	3 1573 1	DCA	R1S	
0638	REF	21	LAST	862	33,2646	53'521 1	EXCH	R	
0639					33,2647	0 0006 1		EXTEND	
0640	REF	5	LAST	872	33,2650	3 1575 1	DCA	R1S +2	
0641	REF	22	LAST	872	33,2651	53'523 0	EXCH	F +2	
0642					33,2652	0 0006 1		EXTEND	
0643	REF	6	LAST	872	33,2653	3 1577 0	DCA	R1S +4	
0644	REF	23	LAST	872	33,2654	53'525 0	EXCH	R +4	
0645					33,2655	0 0006 1		EXTEND	
0646	REF	6	LAST	872	33,2656	3 1601 1	DCA	V1S	
0647	REF	12	LAST	872	33,2657	53'527 1	EXCH	V	
0648					33,2660	0 0006 1		EXTEND	
0649	REF	7	LAST	872	33,2661	3 1603 0	DCA	V1S +2	
0650	REF	14	LAST	872	33,2662	53'531 0	EXCH	V +2	
0651					33,2663	0 0006 1		EXTEND	
0652	REF	8	LAST	872	33,2664	3 1605 0	DCA	V1S +4	
0653	REF	15	LAST	872	33,2665	53'533 1	EXCH	V +4	
0654	REF	1			33,2666	1 2275 1	TCF	CCPYCYCL	COMPLETE THE CCPYCYCL.

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P1702 *****
R0715 *****

0706				33,2667	41456 0	CALCGRV	UNIT	FLSH	SAVE UNIT/R/ IN PUSHLIST	(11)
0707	REF	30	LAST	872	33,2670			STORE	UNIT/R/	
0708				33,2671	6734 1			LXC,1	SLCAC	RTX2 = 1 IF EARTH ORBIT, =2 IF LUNAR.
0709	REF	15	LAST	772	33,2672				RTX2	
0710	REF	16	LAST	873	33,2673				RTX2	
0711				22,2674	50076 0			DCCMP	BAN	
0712	REF	1		33,2675	66724 0				CALCGRV1	
0713				33,2676	50375 0			VLCAD	DCT	(12)
0714	REF	9	LAST	834	33,2677				UNITZ	
0715	REF	31	LAST	873	33,2700				UNIT/P/	
0716				33,2701	41552 0			SL1	PUSH	(14)
0717				33,2702	44316 0			DSQ	BDSU	
0718	REF	1		33,2713	26766 1				DPI/20	
0719				33,2714	56325 0			PDCL	DEV	
0720	REF	1		33,2715	26040 1				RESQ	
0721				33,2716	00043 0				34E	(RN)SQ
0722				33,2717	00041 1			STORE	32D	TEMP FOR (RE/PN)SQ
0723				33,2718	41205 0			EMP	DMP	
0724	REF	1		33,2711	26142 0				20J	
0725				33,2712	65261 0			VXSC	PDCL	
0726	REF	32	LAST	873	33,2713	03537 0			UNIT/R/	
0727				33,2714	41205 0			EMP	DMP	
0728	REF	1		33,2715	26144 0				2J	
0729				33,2716	00041 1				32E	
0730				33,2717	76561 1			VXSC	VSL1	
0731	REF	10	LAST	873	33,2720	06516 0			UNITZ	
0732				33,2721	45455 1			VAD	STADR	
0733	REF	2	LAST	773	33,2722	74256 0		STORE	UNITGCB1	
0734				33,2723	41455 0			VAD	PUSH	MPAC = UNIT GRAVITY VECTOR. (18)
0735				22,2724	60345 0	CALCGRV1	DLCAD		NCRM	PERFORM A NORMALIZATION ON RMAGSQ IN
0736				33,2725	07043 0				34D	ORDER TO BE ABLE TO SCALE THE MU FOR
0737	REF	14	LAST	770	33,2726	00050 1			X2	MAXIMUM PRECISION.
0738				33,2727	53663 1			RDDV*	SLR*	
0739	REF	1		33,2730	26032 1				-MODT,1	
0740				33,2731	56623 0				0 -210,2	
0741				22,2732	45561 1			VXSC	STADR	
0742	REF	3	LAST	838	33,2733	74214 0		STORE	GDT1/2	SCALED AT 2(+7) M/C S
0743				33,2734	77616 0			RVG		
0744				33,2735	61375 1	CALCGRV1	VLCAD	VXM		
0745	REF	6	LAST	855	33,2736	00325 0			DELV	
0746	REF	36	LAST	871	33,2737	01724 0			PEFSMMAT	
0747				33,2740	76561 1			VXSC	VSL1	
0748	REF	4	LAST	855	33,2741	26022 0			KFIF1	
0749	REF	5	LAST	764	33,2742	02527 1		STORE	DELVREF	
0750				33,2743	41562 0			VSR1	PUSH	
0751				33,2744	41455 0			VAD	PUSH	(CV-CLEGET)/2 TO PD SCALED AT 2(+7)M/C S

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0752	REF	8	LAST	812	33,2745	01236	1		GDT/2	
0753					33,2746	65255	0	VAD	PDDL	(18)
0754	REF	8	LAST	754	33,2747	01226	0		VN	
0755	REF	4	LAST	865	33,2750	01247	1		PGUICE	
0756					33,2751	74261	1	SL	VXSC	
0757					33,2752	20207	0		6D	
0758					33,2753	44055	1	VAD	STC	
0759	REF	14	LAST	862	33,2754	01220	0		RA	
0760					33,2755	00037	0		310	
0761	REF	6	LAST	871	33,2756	37545	1	STCALL	RNI	TEMP STORAGE OF RN SCALED 2(+29)M
0762	REF	2	LAST	862	33,2757	66667	0		CALCGRV	
0763					33,2760	53255	0	VAD	VAD	
0764					33,2761	77655	1	VAD		
0765	REF	9	LAST	874	33,2762	01226	0		VN	
0766	REF	6	LAST	871	33,2763	37553	0	STCALL	VNI	TEMP STORAGE OF VN SCALED 2(+7)M/CS
0767					33,2764	00027	0		310	
0768					33,2765	01463	1	EP1/2)	2DEC	0.05
0768					33,2766	06315	0			
0769					33,2767	00010	0	SHIFT 11	2DEC	1 R-11
0769					33,2770	00000	1			

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P0770 *****

R0772 MINRVE IS A SPECIAL AV-PAGE G INTEGRATION ROUTINE USED BY THRUSTING
 P0773 PROGRAMS WHICH FUNCTION IN THE VICINITY OF AN ASSUMED SPHERICAL MCCN.
 R0774 THE INPLT AND OUTPLT QUANTITIES ARE REFERENCED TO THE STABLE MEMBER
 R0775 COORDINATE SYSTEM.

C776					33,2771	41575 0	RVENTH	VLCAD	PLSH	
C777	RFF	3	LAST	726	33,2772	02317 0			G(CSM)	
C778					33,2773	65255 0		VAD	PDDL	
C779	RFF	5	LAST	862	33,2774	01726 0			V(CSM)	
C780	RFF	5	LAST	874	33,2775	01247 1			PGUIDE	
C781					33,2776	74271 0		DCV	VXSC	
C782	RFF	1			33,2777	26770 0			SHIFT11	
C783					33,3000	77655 1		VAD		
C784	RFF	6	LAST	862	33,3001	01720 0			R(CSM)	
C785	RFF	7	LAST	872	33,3002	37573 1		STCALL	PIS	
C786	RFF	5	LAST	862	33,3003	67067 1			MLNGRAV	
C787					33,3004	53255 0		VAF	VAD	
C788	RFF	6	LAST	875	33,3005	01726 0			V(CSM)	
C789					33,3006	77626 0		STADR		
C790	RFF	9	LAST	872	33,3007	74176 1		STCRF	VIS	
C791					33,3010	77776 1		EXIT		
C792	RFF	6	LAST	871	33,3011	03514 1		TC	QUICKFAZ5	
C793	RFF	150	LAST	871	33,3012	06042 1		TC	INTERPRET	
C794					33,3013	77775 1		VLCAD		
C795	RFF	4	LAST	872	33,3014	03563 1			GET1/2	
C796	RFF	4	LAST	875	33,3015	26217 0		STCVL	G(CSM)	
C797	RFF	8	LAST	875	33,3016	03573 0			PIS	
C798	RFF	7	LAST	875	33,3017	25720 0		STCVL	R(CSM)	
C799	RFF	17	LAST	875	33,3020	03601 0			VIS	
C800	RFF	7	LAST	875	33,3021	01726 0		STORE	V(CSM)	
C801					33,3022	77776 1		EXIT		
C802	RFF	7	LAST	875	33,3023	03514 1		TC	QUICKFAZ5	
C803	RFF	151	LAST	875	33,3024	06042 1		TC	INTERPRET	
C804					33,3025	74375 0	MINRVE	VLCAD	VXSC	
C805	RFF	7	LAST	873	33,3026	03325 0			DELV	
C806	RFF	1			33,3027	26724 0			KEIP2	
C807					33,3030	53206 0		PLSH	VAD	1ST PLSH: DELV IN UNITS OF 2(8) M/CS
C808	RFF	9	LAST	874	33,3031	01236 1			GET/2	
C809					33,3032	53206 0		PLSH	VAD	2ND PLSH: (DELV + GET)/2, UNITS OF 2(7)
C810	RFF	16	LAST	872	33,3033	03527 1			V	(12)
C811					33,3034	56325 0		PDDL	DCV	
C812	RFF	6	LAST	875	33,3035	01247 1			PGUIDE	
C813	RFF	2	LAST	875	33,3036	26770 0			SHIFT11	
C814					33,3037	77761 1		VXSC		
C815					33,3040	77655 1		VAD		
C816	RFF	24	LAST	872	33,3041	03521 1			R	
C817	RFF	9	LAST	875	33,3042	37573 1		STCALL	PIS	STORE R SCALFE AT 2(+24)M.
C818	RFF	6	LAST	875	33,3043	67067 1			MLNGRAV	

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0810				33,3144	53255 0	VAD	VAD	
0820				33,3145	77655 1	VAD		(0)
0821	REF	17	LAST	875	33,3146	13527 1	V	
0822	REF	11	LAST	875	33,3147	02601 0	STCR	VIS
0823					33,3150	77646 0	ABVAL	STCR V SCALED AT 2(+7)M/CS.
0824	REF	5	LAST	727	33,3051	27472 0	STCVL	AEVFL
0825	REF	33	LAST	872	33,3152	13537 0		STCR SPEED FOR LR AND DISPLAYS.
0826					33,3153	72441 0	DCT	UNIT/R/ SL1
0827	REF	12	LAST	876	33,3054	02611 0		VIS
0828	REF	11	LAST	812	33,3155	27474 0	STCVL	HDDTOISP
0829	REF	10	LAST	875	33,3056	13573 0		RIS
0830					33,3157	72435 0	VXV	VSL2
0831	REF	6	LAST	848	33,3160	12125 1		WM
0832	REF	2	LAST	812	33,3061	17734 1	STCCL	DEIVS
0833					33,3162	11045 0		360
0834					33,3063	77625 0	DSU	
0835	REF	11	LAST	871	33,3164	12333 0		/LAND/ HCLC
0836	REF	5	LAST	871	33,3165	37315 0	STCALL	FOR NCW, DISPLAY WHETHER FCS CR NEC
0837	REF	1			33,3166	66461 1		MUNRETRN
0838					33,3167	77656 1	MLNGRAV	UNIT
0839	REF	34	LAST	876	33,3170	17537 0	STOCL	UNIT/R/ 340
0840					33,3071	11043 0		340
0841					33,3172	55261 1	SL	BDDV
0842					33,3173	21217 0		60
0843	REF	1			33,3074	26036 0		-MUDTUN
0844					33,3175	74215 0	DMP	VXSC
0845	REF	3	LAST	875	33,3076	26773 0		SHIFT11
0846	REF	25	LAST	876	33,3077	13537 0		UNIT/R/ GDT1/2
0847	REF	5	LAST	875	33,3100	13563 1	STORE	1/2GDT SCALED AT 2(7)M/CS.
0848					33,3101	77616 0	RVG	
0849					33,3102	02213 1	1.95SFCS	DEC
0850					33,3103	01015 1	7.5	2DEC
0851					33,3104	33212 0		
0851					33,3105	01014 1	2SEC(18)	2DEC
0851					33,3106	20100 1		200 R-18
0852					33,3107	00000 1	2SEC(28)	2DEC
0852					33,3110	00310 0		00000 00310
08525					33,3111	00110 1	4SEC(28)	2DEC
08525					33,3112	00620 0		400 R-23
0853					33,3113	00110 1	8ITS4-7	CCT
08534					33,3114	31767 0	1-30KFT	2DEC
08534					33,3115	02211 1		16768072 R-24
08536					33,3116	04445 0	6KFT/SEC	DEC
							18.288 R-7	6000 FT/SEC AT 2(7)M/CS

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0897	REF 154	LAST 877	33,3171	66042 1	TC	INTERP	
0898			33,3172	45246 0	ABS	DSL	
0899	REF 2	LAST 122	33,3173	02521 0		DELQFIX	ABS(DELTAH) - DQFIX 50 FT ACM
0900			33,3174	45252 0	SL3	DSU	SCALE TO 2(21)
0901	REF 7	LAST 877	33,3175	03535 1		HCALL	ABS(DELTAH) - (50 + HCALL/8) AT 2(21)
0902			33,3176	77776 1	EXIT		
0903	REF 2	LAST 151	33,3177	251670 1	INCR	LFLCTR	
0904	REF 1		33,3210	06726 1	TC	BRANCH	
0905	REF 1		33,3211	13522 0	TCF	HFAIL	DELTA F TOC LARGE
0906	REF 2	LAST 878	33,3212	13522 0	TCF	HFAIL	DELTA F TCC LARGE
0907	REF 89	LAST 847	33,3213	05516 0	TC	DOWNFLAG	TURN OFF ALT FAIL LAMP
0908	REF 1		33,3214	00263 0	ADRES	HFLSFLLG	
0909	REF 25	LAST 877	33,3225	40107 0	NCRFASCHN	CS	FLGWRD11
0910	REF 1		33,3206	74744 0	MASK	LRINHEIT	
0911	REF 262	LAST 877	33,3207	10000 0	CCS	A	
0912	REF 2	LAST 877	33,3210	13252 0	TCF	VMEASCHK	UPDATE INHIBITED - TEST VELOCITY ANYWAY
0913	REF 155	LAST 878	33,3211	06042 1	TC	INTPET	CC POSITION UPDATE
0914			33,3212	40545 1	DLOAD	SP4	
0915	REF 8	LAST 878	33,3213	03535 1		HCALL	RESCALE F TO 2(2F)M
0916			33,3214	77776 1	EXIT		
0917			33,3215	00006 1	EXTEND		
0918	REF 6	LAST 877	33,3216	31665 1	ECA	DELTAH	STORE DELTAH IN MPAC AND
0919	REF 352	LAST 872	33,3217	52155 1	DXCH	MPAC	BRING HCALL INTO A,L
0920	REF 1		33,3220	07547 0	TC	ALSIGNAG	
0921			33,3221	07116 1	EXTEND		IF HIGH PART OF HCALL IS NON ZERO, THEN
0922			33,3222	13224 1	BZF	+2	HCALL > HMAX,
0923	REF 3	LAST 878	33,3223	13252 0	TCF	VMEASCHK	SO UPDATE IS BYPASSED
0924	REF 353	LAST 878	33,3224	54156 1	TS	MPAC +2	FOR LATER SECRTMP
0925	REF 141	LAST 865	33,3225	40001 1	CS	L	-H AT 2(14)M
0926	REF 1		33,3226	61420 0	AD	LFHMAX	HMAX - F
0927			33,3227	00006 1	EXTEND		
0928	REF 4	LAST 878	33,3230	63252 1	BZMF	VMEASCHK	IF H > HMAX, BYPASS UPDATE
0929			33,3231	00006 1	EXTEND		
0930	REF 1		33,3232	71421 0	MP	LRWH	WH(HMAX - F)
0931			33,3233	00006 1	EXTEND		
0932	REF 2	LAST 878	33,3234	111420 1	CV	LRHMAX	WH(1 - F/HMAX)
0933	REF 4	LAST 464	33,3235	54135 1	TS	MPTMP	
0934	REF 1		33,3236	07316 1	TC	SECRTMP2	DELTAH (WH)(1 - H/HMAX) IN MPAC
0935	REF 156	LAST 878	33,3237	06042 1	TC	INTERP	MODE IS OF FROM ABOVE
0936			33,3240	77752 1	SL1		
0937			33,3241	52261 0	VXSC	VAF	
0938	REF 37	LAST 877	33,3242	03537 0		UNIT/R/	DELTAH = CF(WH)(1 - H/HMAX) UNIT/P/
0939	REF 11	LAST 876	33,3243	03573 0		RIS	
0940	REF 1		33,3244	37657 1	STCALL	GNLR	
0941	REF 7	LAST 875	33,3245	67067 1		MUNGRAV	
0942			33,3246	77776 1	EXIT		

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0943	PEF	8	LAST	875	33,3247	0 3514 1	TC	QUICKFAZ5	
0944	REF	162	LAST	866	33,3250	3 4755 1	CA	ZERO	
0945	PEF	1			33,3251	0 3476 1	RLDATEC TC	GNURVST	
0946	REF	5	LAST	879	33,3252	0 3514 1	VMEASCHK TC	QUICKFAZ5	RESTART AT NEXT LOCATION
0947	PEF	26	LAST	878	33,3253	4 0107 0	CS	FLGWRP11	
0948	REF	1			33,3254	7 4745 1	MASK	VFLDABIT	IS V READING AVAILABLE?
0949	REF	262	LAST	878	33,3255	10 010 0	CCS	A	
0950	PEF	1			33,3256	1 3456 1	TCF	VALTCHK	NO SEE IF V READING TC BE TAKEN
0951	REF	3	LAST	201	33,3257	4 1651 0	VFLUPDAT CS	VSELECT	PROCESS VELOCITY DATA
0952	PEF	142	LAST	878	33,3261	54 001 1	TS	L	
0953	PEF	143	LAST	879	33,3261	26 001 1	ADS	L	-2 VSELECT IN L
0954	REF	144	LAST	879	33,3262	6 0001 0	AD	L	
0955	REF	145	LAST	879	33,3263	6 0001 0	AD	L	-6 VSELECT IN A
0956	REF	27	LAST	877	33,3264	50 120 1	INDEX	FIXLCC	
0957	REF	23	LAST	815	33,3265	52 047 0	EXCH	X1	X1 = -6 VSELECT, X2 = -2 VSELECT
0958	PEF	4	LAST	869	33,3266	3 4741 1	CA	FRANK4	
0959	PEF	37	LAST	870	33,3267	54 003 0	TS	FRANK	
0960	PEF	2	LAST	117	33,3268	4 1654		FRANK= LRXCFU	
0961	REF	2	LAST	117	33,3270	3 1655 0	CA	LRXCDL	STORE LFCDS IN CCUSPCT5
0962	PEF	15	LAST	604	33,3271	54 765 1	TS	CDUSPCT	
0963	PEF	2	LAST	117	33,3272	3 1656 0	CA	LRXCDL	
0964	REF	20	LAST	879	33,3273	54 767 0	TS	CDUSPCT +2	
0965	PEF	3	LAST	879	33,3274	3 1654 1	CA	LRXCFU	
0966	REF	21	LAST	879	33,3275	54 771 1	TS	CDUSPCT +4	
0967	REF	240	LAST	858	33,3276	1 4616 1	TC	BANKCALL	
0968	PEF	3	LAST	856	33,3277	47617 1	CADR	QUICTRIC	GET SINES AND COSINES FOR NBSM
0969	REF	28	LAST	879	33,3300	3 0120 1	CA	FIXLCC	
0970	REF	10	LAST	877	33,3301	54 166 1	TS	PUSHLCC	SET PC TO ZERO
0971	REF	157	LAST	878	33,3302	0 6042 1	TC	INTPRET	
0972					33,3303	45173 0	VLCAD*	CALL	
0973	REF	2	LAST	117	33,3304	02231 0		VZEFAMNB,1	CONVERT VREAM FROM NB TO SM
0974	REF	4	LAST	584	33,3305	47675 0		*NBSM*	
0975					33,3306	54325 1	PDDL	SL	STORE IN PC 0-5
0976	REF	3	LAST	202	33,3307	03653 1		VMEAS	LOAD VELOCITY MEASUREMENT
0977					33,3308	20215 0		120	
0978					33,3311	41403 0	DMF*	PUSH	SCALE TO M/CS AT 2(6)
0979	REF	1			33,3312	51764 0		VZSCAL,2	AND STORE IN PC 6-7
0980					33,3313	77776 1	EXIT		
0981	REF	55	LAST	856	33,3314	4 4753 0	CS	CNF	
0982	PEF	14	LAST	819	33,3315	54 163 1	TS	PCDE	CHANGE STORE MODE TO VECTOR
0983	REF	3	LAST	120	33,3316	3 1657 1	CA	PIPTM	STORE DFLV IN MPAC

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0984					33,3317	22 007 0	ZL		
0985	REF 354	LAST	878		33,3320	52 155 1	EXCH	MPAC	
0986	REF 4	LAST	875		33,3321	3 1660 0	CA	PIPTEN +1	
0987					33,3322	22 007 0	ZL		
0988	REF 355	LAST	880		33,3323	52 160 1	EXCH	MPAC +3	
0989	REF 5	LAST	880		33,3324	2 1661 1	CA	PIPTEN +2	
0990					33,3325	22 007 0	ZL		
0991	REF 356	LAST	880		33,3326	52 162 0	EXCH	MPAC +5	
0992	REF 10	LAST	845		33,3327	2 5016 0	CA	EBANK7	
0993	REF 38	LAST	879		33,3330	54 003 0	TS	EBANK	RESTORE EBANK 7
0994	REF 50	LAST	870		33,3331	0 6042 1	EBANK=	OVNCTR	
0995	REF 158	LAST	879		33,3332	65361 0	TC	INTPRST	
0996					33,3333	26022 0	VXSC	PCDL	
0997	REF 5	LAST	873		33,3334	02253 1	KFIPI	LRVTIME	SCALE DELV TO 2(7) M/C S AND PUSH
0998	REF 2	LAST	117		33,3335	56225 1	DSU	DCV	TIME OF DELV AT 2(28)CS
0999					33,3336	01234 0	PIPTIME		TU - T(N-1)
1000	REF 21	LAST	865		33,3337	27110 1	2SEC(28)		
1001	REF 1				33,3340	76561 1	VXSC	VSL1	G(N-1)(TU - T(N-1))
1002					33,3341	01236 1	GDT/2		SCALED AT 2(7) M/C S
1003	REF 10	LAST	875		33,3342	53255 0	VAD	VAD	PLSH LP FOR DELV
1004					33,3343	03527 1	V		VU = V(N-1) + DELVU + C(N-1) CTL
1005	REF 18	LAST	876		33,3344	53352 0	VSL2	VAD	SCALE TO 2(5) M/C S AND SUTRACT
1006					33,3345	03734 1	DELVS		MCCN RECTATION.
1007	REF 5	LAST	877		33,3346	51406 1	PLSH	ABVAL	STORE IN FC
1008					33,3347	43202 0	SR4	DAD	ABS(VM)/E + 7.5 AT 2(6)
1009	REF 1				33,3350	27104 1	7.5		
1010					33,3351	24025 0	STOVL	200	STORE IN 200 AND PICK UP VM
1011					33,3352	44241 0	DOT	BFSU	V(EST) AT 2(6)
1012					33,3353	66201 0			DELTA V = VMEAS - V(EST)
1013					33,3354	51406 1	PUSH	ABS	
1014					33,3355	77425 1	ESU	EXIT	ABS(DV) - (7.5 + ABS(VM)/E)
1015					33,3356	00025 0	200		
1016									
1017	REF 2	LAST	151		33,3357	250672 0	INCR	LRMCTR	
1018	REF 2	LAST	878		33,3360	0 6726 1	TC	BRANCH	
1019	REF 1				33,3361	1 3537 1	TCF	VFAIL	DELTA V TOC LARGE ALARM
1020	REF 2	LAST	880		33,3362	1 3537 1	TCF	VFAIL	DELTA V TOC LARGE ALARM
1021	REF 90	LAST	878		33,3363	0 5516 0	TC	DOWNFLAG	TURN OFF VEL FAIL LAMP
1022	REF 1				33,3364	07262 1	ADRES	VFLSHFLG	
1023	REF 27	LAST	879		33,3365	3 0107 1	CA	FLCWRD11	
1024	REF 1				33,3366	7 4740 1	MASK	VXINHBIT	
1025					33,3367	0 0006 1	EXTEND		
1026	REF 1				33,3370	1 3377 0	BZF	VLPDAT	IF VX INHIBIT RESET, INCORPORATE DATA.

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1027	REF	91	LAST	880	33,3371	0 5516 0	TC	DWNFLAG	
1028	REF	1			33,3372	00250 C	ADRES	VXINH	RESET VX INHIBIT
1029	REF	4	LAST	879	33,3373	3 1651 1	CA	VSELECT	
1030	REF	5	LAST	562	33,3374	6 7751 0	AC	MFG2	IF VSELECT = 2 (X AXIS),
1031					33,3375	0 0006 1	EXTEND		BYPASS UPDATE
1032	REF	1			33,3376	1 3456 1	BZF	ENDVDAT	
1033	REF	28	LAST	880	33,3277	4 0107 C	VLPDAT	CS	FLGWRE11
1034	REF	2	LAST	878	33,3400	7 4744 0	MASK	LRINHBIT	
1035	REF	244	LAST	879	33,3401	10 000 0	CCS	A	
1036	REF	2	LAST	879	33,3402	1 3456 1	TCF	VALTCHK	UPDATE INHIBITED
1037	REF	357	LAST	880	33,3403	54 155 1	TS	MPAC +1	
1038	REF	6	LAST	876	33,3404	3 1471 1	CA	AEVEL	STORE E7 ERASABLES NEEDED IN TEMPS
1039	REF	1			33,3405	54 130 1	TS	ABVFL*	
1040	REF	5	LAST	881	33,3406	3 1651 1	CA	VSELECT	
1041	REF	1			33,3407	54 131 0	TS	VSELECT*	
1042	REF	10	LAST	820	33,3410	3 5014 1	CA	EBANKS	
1043	REF	39	LAST	880	33,3411	54 003 0	TS	EBANK	CHANGE EBANKS
1044	REF	2	LAST	123	33,3412	4 1527 1	EBANK =	LRVF	
1045	REF	3	LAST	881	33,3412	4 1527 1	CS	LRVF	
1046	REF	2	LAST	881	33,3413	6 0130 0	AC	ABVFL*	IF V < VV, USE WV
1047					33,3414	0 0006 1	EXTEND		
1048	REF	1			33,3415	6 3430 0	BZMF	USEVF	
1049	REF	3	LAST	881	33,3416	4 0130 1	CS	ABVFL*	
1050	REF	2	LAST	123	33,3417	6 1526 1	AD	LRVMAX	VMAX - V
1051					33,3420	0 0006 1	EXTEND		
1052	REF	1			33,3421	6 3423 0	BZMF	WSTOR -1	IF V > VMAX, W = 0
1053					33,3422	0 0006 1	EXTEND		
1054	REF	2	LAST	881	33,3423	5 0131 1	INDEX	VSELFCT*	
1055	REF	2	LAST	123	33,3424	7 1530 1	MP	LRWVZ	WV(VMAX - V)
1056					33,3425	0 0006 1	EXTEND		
1057	REF	3	LAST	881	33,3426	11 1526 C	CV	LRVMAX	WV(1 - V/VMAX)
1058	REF	2	LAST	881	33,3427	1 3434 0	TCF	WSTOR	
1059	REF	2	LAST	881	33,3430	50 131 1	USEVF	INDEX	VSELFCT*
1060	REF	2	LAST	123	33,3431	2 1533 C	CA	LRWVFZ	USE APPROPRIATE CONSTANT WEIGHT
1061	REF	3	LAST	881	33,3432	1 3434 0	TCF	WSTOR	
1062	REF	163	LAST	879	33,3433	3 4755 1	-1	CA	ZFRC
1063	REF	358	LAST	881	33,3434	54 154 0	WSTOR	TS	MPAC
1064	REF	27	LAST	870	33,3435	4 4745 1		CS	BIT7
1065	REF	18	LAST	829	33,3436	6 1010 1		AD	MCDREG
1066					33,3437	0 0006 1	EXTEND		

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1067				23,3440	6 2443 1	BZMF	+3	IF IN P65,P66,P67, USE ANCTHER CONSTANT
1068	REF	2	LAST	123	33,3441	3 1536 0	CA	LRWVFF
1069	REF	35	LAST	881	23,3442	54 154 0	TS	MPAC
1070	REF	11	LAST	880	33,3443	3 5016 0	+3	CA EBANK7
1071	REF	40	LAST	881	33,3444	54 773 0	TS	EBANK CHANGE EBANKS
1072	REF	7	LAST	881	57,1471		EBANK=	AEVEL
1073	REF	159	LAST	881	33,3445	1 6142 1	TC	INTPRET
1074					33,3446	74235 0	CMF	VXSC
1075					33,3447	77655 1	VAD	
1076	REF	14	LAST	877	33,3450	03671 0	VIS	ADD WEIGHTED CELTA V TO VELCCITY
1077	REF	1			33,3451	03657 0	STCRE	GNLV
1078					33,3452	77776 1	EXIT	
1079	REF	10	LAST	879	33,3453	0 3514 1	TC	QUIKFA75 DO NOT RE-UPDATE
1080	REF	16	LAST	806	33,3454	3 6245 1	CA	SIX
1081	REF	2	LAST	879	33,3455	0 3476 1	UPDATED TC	GNURVST
1082	REF	3	LAST	881	33,3456		ENDVEAT =	VALTCHK STORE NEW VELCCITY VECTOR
1083	REF	11	LAST	882	33,3456	0 3514 1	VALTCHK TC	QUIKFA25 DO NOT REPEAT ABOVE
1084	REF	1			33,3457	3 4747 1	CAF	READVBIT
1085	REF	25	LAST	881	33,3460	7 0147 0	MASK	FLGWRD11
1086	REF	265	LAST	881	33,3461	10 000 0	CCS	A
1087	REF	1			33,3462	1 3471 1	TCF	READV
1088	REF	8	LAST	882	33,3463	4 1471 0	CS	ABVFL
1089	REF	1			33,3464	6 3116 1	AD	6KFT/SEC
1090					33,3465	0 0006 1	EXTEND	
1091	REF	4	LAST	877	33,3466	6 2545 1	BZMF	CCNTSERV V > 6000 FT/SEC. DO NOT READ VELOCITY.
1092	REF	59	LAST	869	33,3467	1 5504 0	TC	UPFLAG
1093	REF	1			33,3470	00257 1	ADRES	READVEL V < 6000 FT/SEC. SET READVEL AND READ.
1094	REF	3	LAST	868	33,3471	3 7723 0	READV	CAF
1095	REF	24	LAST	867	33,3472	0 5072 1	TC	NCVAC
1096	REF	7	LAST	877	57,1654		EBANK=	HNEAS
1097	REF	1			33,3473	03560 1	2CADR	LRVJOB
1097	REF	1			33,3474	66067 0		
1098	REF	5	LAST	882	33,3475	1 2545 0	TCF	CCNTSERV CONTINUE WITH SERVICER
1099	REF	78	LAST	851	33,3476	54 131 1	GNURVST	TS
1100					33,3477	0 0006 1	EXTEND	RUF
1101	REF	2	LAST	878	33,3500	2 1657 1	DCA	GNLR
1102	REF	79	LAST	882	33,3501	50 131 0	INCFX	RUF
1103	REF	12	LAST	878	33,3502	50 573 0	EXCH	RIS
1104					33,3503	0 0006 1	EXTEND	

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1105	REF	3	LAST	882	33,3504	3 1661 1	CCA	GNLP +2
1106	REF	80	LAST	882	33,3505	50 131 0	INDEX	BLF
1107	REF	13	LAST	882	33,3506	53,575 0	EXCF	RIS +2
1108					33,3507	0 0006 1	EXTEND	
1109	REF	4	LAST	883	33,3510	3 1663 0	CCA	GNUR +4
1110	REF	81	LAST	883	33,3511	50 120 0	INDEX	BLF
1111	REF	14	LAST	883	33,3512	52,577 1	DXCF	RIS +4
1112	REF	220	LAST	867	33,3513	0 0002 0	TC	Q

1113	REF	3	LAST	820	33,3514	2 5007 0	CLIKFAZ5	CA	EBANK3	
1114	REF	41	LAST	882	33,3515	56 003 1	XCH	EBANK		SET EBANK 3
1115	REF	146	LAST	879	33,3516	52 002 1	EXCF	L		Q TO A, A TC L
1116	REF	1			03,1446		EBANK=	PHSNAME5		
1117	REF	2	LAST	883	33,3517	55,446 1	TS	PHSNAME5		
1118	REF	42	LAST	882	33,3520	22 003 1	LXCF	EBANK		
1119	REF	51	LAST	880	07,1515		EBANK=	DVCNTR		
1120	REF	266	LAST	882	33,3521	0 0010 1	TC	A		

1121	REF	2	LAST	151	33,3522	4 1671 1	HEAIL	CS	LPRCTR	
1122					33,3523	0 0006 1		EXTEND		
1123	REF	1			33,3524	1 3534 1	BZF	NCPLITE		IF R = 0, DO NOT TURN ON TRK FAIL
1124	REF	3	LAST	878	33,3525	6 1670 1	AD	LRLCTR		
1125	REF	1			33,3526	7 7750 0	MASK	NEG3		
1126					33,3527	0 0006 1	EXTEND			IF L-R LT 4, DO NOT TURN ON TRK FAIL
1127					33,3530	1 3532 1	BZF	+2		
1128	REF	2	LAST	882	33,3531	1 3534 1	TCF	NCPLITE		
1129	REF	60	LAST	882	33,3532	0 5504 0	TC	UPFLAG		AND SET PIT TC TURN ON TRACKER FAIL LITE
1130	REF	2	LAST	878	33,3533	00263 0	ADRES	HFLSHFLG		
1131	REF	4	LAST	882	33,3534	3 1670 1	NCPLITE	CA	LRLCTR	
1132	REF	3	LAST	882	33,3535	55,671 1	TS	LPRCTR		SET R = 1
1133	REF	5	LAST	878	33,3536	1 3252 0	TCF	VMEASCHK		

1134	REF	2	LAST	151	33,3537	4 1673 0	VFAIL	CS	LRSCTR	DELTA C LAPEE
1135					33,3540	0 0006 1		EXTEND		IF S = 0, DO NOT TURN ON TRACKER FAIL
1136	REF	1			33,3541	1 3551 1	BZF	NCPLITE		
1137	REF	3	LAST	880	33,3542	6 1672 0	AD	LPMCTR		M-S
1138	REF	2	LAST	883	33,3543	7 7750 0	MASK	NEG3		TEST FOR M-S > 3
1139					33,3544	0 0006 1	EXTEND			IF M-S > 3, THEN TWO OR MORE OF THE
1140					33,3545	1 3547 0	BZF	+2		LAST FOUR V READINGS WERE BAD,
1141	REF	2	LAST	883	33,3546	1 3551 1	TCF	NCPLITE		SO TURN ON VELOCITY FAIL LIGHT
1142	REF	61	LAST	882	33,3547	0 5504 0	TC	UPFLAG		AND SET PIT TO TURN ON TRACKER FAIL LITE
1143	REF	2	LAST	880	33,3550	00262 1	ADRES	VFLSHFLG		

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1144	REF	4	LAST	883	33,3551	3 1672 0	ACLITE	CA	LRMCTR	SET S = N
1145	REF	3	LAST	883	33,3552	55 1673 0		TS	LPSCTR	
1146	REF	6	LAST	881	33,3553	11 1651 0		CCS	VSFLECT	TEST FOR Z COMPONENT
1147	REF	2	LAST	881	33,3554	1 3456 1		TCF	ENDVDAT	ACT Z, PC ACT SET VX INHIBIT
1148	REF	62	LAST	883	33,3555	7 5504 0		TC	UPFLAG	Z COMPONENT - SET FLAG TO SKIP X
1149	REF	2	LAST	881	33,3556	00250 0		ADRES	VXINH	COMPONENT, AS ERROR MAY BE DUE TO CROSS
1150	REF	3	LAST	884	33,3557	1 3456 1		TCF	ENDVDAT	LOBE LOCK UP ACT DETECTED ON X AXIS.

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P1151 *****
 R1152 LRVJCR IS SET WHEN THE LFM IS BELOW 15000 FT DURING THE LANDING PHASE
 R1154 THIS JOB INITIALIZES THE LANDING RADAR READ ROUTINE FOR 5 VELOCITY
 R1155 SAMPLES AND GOES TO SLEEP WHILE THE SAMPLING IS DONE-ABOUT 500 MS.
 R1156 WITH A GOODEND RETURN THE DATA IS STORED IN VMEAS AND BIT7 OF LRSTAT
 R1157 IS SET. THE GIMBAL ANGLES ARE READ ABOUT MIDWAY IN THE SAMPLING ..

I158 REF 7 LAST 449 4361 170MS EQUALS NCI

I159 REF I 33,3560 3 4361 LRVJCR CA 170MS SET TASK TO READ CDUS + PIPAS
 I160 REF 36 LAST 854 33,3561 0 5203 TC WAITLIST

I161 REF 2 LAST 880 F4,1652 ERANK= LRVTIME
 I162 REF 1 33,3562 0 2632 2CADR RDGINS
 I162 REF 1 33,3563 70764 1

I163 REF 7 LAST 884 33,3564 11'651 0 CCS VSELECT SEQUENCE LR VEL EEAM SELECTOR
 I164 33,3565 1 3567 1 TCF +2

I165 REF 56 LAST 852 33,3566 3 4752 0 CAF TWC IF ZERO-RESET TO TWC
 I166 33,3567 6 0000 1 DOUBLE 2XVSELECT USED FOR VBFAIM INDEX IN LRVEL

I167 REF 241 LAST 879 33,3570 0 4616 1 TC BANKCALL GO INITIALIZE LR VEL READ ROUTINE
 I168 REF 1 33,3571 53116 1 CACR LRVEL

I169 REF 242 LAST 885 33,3572 0 4616 1 TC BANKCALL PUT LRVJCR TO SLEEP ABOUT 500 MS
 I170 REF 15 LAST 609 33,3573 1 7706 0 CACR RADSTALL

I171 REF 1 33,3574 1 2627 0 TCF VBAD
 I172 REF 2 LAST 151 33,3575 11'675 0 CCS STILLBADV IS DATA GOOD JUST PRESENT?
 I173 REF 1 33,3576 1 3630 0 TCF VSTILBAD JUST GOOD - MUST WAIT 4 SECONDS.

I174 33,3577 0 0004 0 INPINT
 I175 33,3600 0 0006 1 EXTEND GOOD RETURN-STOP AWAY VMEAS
 I176 REF 8 LAST 574 33,3601 3 1101 0 CCA SAMPLSUM

I177 REF 4 LAST 879 33,3602 52'653 1 CXCH VMEAS
 I178 REF 5 LAST 879 33,3603 3 4741 1 CA ERANK4 FOR DOWNLINK
 I179 REF 43 LAST 883 33,3604 54 003 0 TS ERANK

I180 REF 4 LAST 885 F4,1652 ERANK= LRVTIME

I181 33,3605 0 0006 1 EXTEND

I182 REF 5 LAST 885 33,3606 3 1653 0 CCA LRVTIME
 I183 REF 2 LAST 201 33,3607 53'740 1 CXCH LRVTIME DL

I184 33,3610 0 0006 1 EXTEND

I185 REF 4 LAST 879 33,3611 3 1655 0 CCA LRXC DL
 I186 REF 3 LAST 202 33,3612 53'735 0 CXCH LRXC DUDL

I187 REF 2 LAST 879 33,3613 3 1656 0 CA LRZC DL
 I188 REF 3 LAST 201 33,3614 55'736 0 TS LRZC DDL

I189 REF 12 LAST 882 33,3615 3 5016 0 CA ERANK7
 I190 REF 44 LAST 885 33,3616 54 002 0 TS ERANK

I191 REF 8 LAST 885 E7,1651 ERANK= VSELECT

I192 REF 30 LAST 882 33,3617 4 0107 0 CS FLGWRD11 SET BIT TO INDICATE VELOCITY
 I193 REF 2 LAST 879 33,3620 7 4745 1 MASK VELDABIT MEASUREMENT MADE.

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1194	REF	31	LAST	885	33,3621	26 107 0	ADS	FLGWRD11	
1195	REF	9	LAST	885	33,3622	11'651 0	ENCLRV	CCS	VSELECT
1196					33,3623	1 3625 1		TCF	+2
1197	REF	57	LAST	885	33,3624	3 4752 0		CA	TWC
1198	REF	17	LAST	886	33,3625	55'651 0		TS	VSELECT
1199	REF	134	LAST	862	33,3626	1 5155 1		TCF	ENDCFJOB
1200	REF	58	LAST	886	33,3627	3 4752 0	VRAD	CAF	TWC
1201	FLF	3	LAST	885	33,3630	55'675 0	VSTILEAD	TS	STILBADV
1202	REF	1			33,3631	1 3622 0		TCF	ENCLRV

R1203 LRFJCE IS SET BY IFTASK WHEN LPM IS BELOW 25000 FT. THIS JOB
 R1204 INITIATES THE LR READ ROUTINE FOR AN ALT MEASUREMENT AND GOES TO
 R1205 SLEEP WHILE THE SAMPLING IS DONE-ABOUT 95 MS. WITH A GOOD RETURN
 R1206 THE ALT DATA IS STORED IN HMEAS AND BIT 7 OF LRSTAT IS SET.

1207					34,3571		BANK	34	
1208	REF	1			34,3570		SETLCC	R12STUFF	
1209					34,3571		BANK		
1210	REF	1					COLLNT*	\$/SERV	

1211	REF	243	LAST	885	34,3571	0 4616 1	LRHJOB	TC	BANKCALL	INITIATE LP ALT MEASUREMENT
1212	REF	2	LAST	493	34,3572	53102 1		CADR	LPALT	
1213	REF	244	LAST	886	34,3573	0 4616 1		TC	BANKCALL	LRFJCE TO SLEEP ABOUT 95MS
1214	REF	16	LAST	885	34,3574	17716 0		CADR	RADSTALL	
1215	REF	1			34,3575	1 3620 1		TCF	HREAD	
1216	REF	2	LAST	151	34,3576	11'674 1		CCS	STILRADH	IS DATA GOOD JUST PRESENT?
1217	REF	1			34,3577	1 3630 0		TCF	HSTILBAD	JUST GOOD - MUST WAIT 4 SECONDS.

1218					34,3600	0 0004 0		INFINT		
1219					34,3601	0 0006 1		EXTEND		
1220	REF	9	LAST	885	34,3602	3 1131 0		CCA	SAMPLSUM	GOOD RETURN-STORE AWAY LPH DATA
1221	REF	8	LAST	882	34,3603	53'655 1		EXCH	HMEAS	LRF DATA 1.075 FT/BIT
1222					34,3604	0 0006 1		EXTEND		FOR DOWNLINK
1223	REF	10	LAST	865	34,3605	3 1561 1		CCA	PIPTIME1	
1224	REF	8	LAST	609	34,3606	53'755 0		EXCH	MKTIME	

1225					34,3607	0 0006 1		EXTEND		
1226	REF	3	LAST	867	34,3610	3 1156 1		CCA	CDUTEMPY	CCUY,2 = AIG,AMG
1227	REF	9	LAST	609	34,3611	53'460 0		EXCH	AIG	

1228	REF	3	LAST	867	34,3612	3 1154 0		CA	CDUTEMPX	CDLX = ACG
1229	REF	7	LAST	609	34,3613	55'461 1		TS	ACG	

1230	REF	32	LAST	886	34,3614	4 0107 0		CS	FLGWRD11	SET BIT TO INDICATE RANGE
1231	REF	2	LAST	877	34,3615	7 4750 0		MASK	RNGEDBIT	MEASUREMENT MADE.
1232	REF	33	LAST	886	34,3616	26 107 0		ADS	FLGWRD11	
1233	REF	135	LAST	886	34,3617	0 5155 0	ENCLRF	TC	ENDCFJOB	TERMINATE LRFJCE

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1234	REF	27	LAST	825	34,3620	3 0101 1	HEAD	CA	FLAGWRD5	
1235	REF	2	LAST	575	34,3621	7 4742 0		MASK	RNGSCBIT	IS BAD RETURN DUE TO SCALE CHANGE?
1236					34,3622	C 0006 1		EXTEND		
1237	REF	2	LAST	886	34,3623	1 2627 0		BZF	HSTILBAC -1	NC RESET HSTILBAC
1238	REF	52	LAST	881	34,3624	0 5516 0		TC	CCWNFLAG	YFS RESET SCALE CHANGE BIT AND IGNORE
1239	REF	4	LAST	609	34,3625	00120 1		ADRES	RNGSCFLG	
1240	REF	136	LAST	886	34,3626	0 5155 0		TC	ENDCFJOB	

1241	REF	59	LAST	886	34,3627	3 4752 0		CAF	TWO	SET STILEAC TO WAIT 4 SECONDS
1242	REF	3	LAST	886	34,3630	551674 1	HSTILBAC	TS	STILBADH	
1243	REF	137	LAST	887	34,3631	0 5155 0		TC	ENDCFJOB	

1244					34,3632			BANK	34	
1245	REF	1			34,2000			SETLCC	SERV4	
1246					34,3632			BANK		

1247	REF	2	LAST	886 TO 887:	32	32*		CCUNT*	\$/SERV	
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R1248 REGIMS IS A TASK SET UP BY LEVJCE TO PICK UP THE IMU CDUS AND TIME
 R1249 AT ABOUT THE MIDPOINT OF THE LR VFL READ RCLTIME WHEN 5 VEL SAMPLES
 R1250 ARE SPECIFIED.

1251	REF	6	LAST	885	E4,1652			EBANK=	LRVTIME	
1252					34,3632	C 0006 1	REGIMS	EXTEND		
1253	REF	27	LAST	865	34,3633	3 0025 0		DCA	TIME2	PICK UP TIME2, TIME1
1254	REF	7	LAST	887	34,3634	531653 1		EXCF	LRVTIME	AND SAVE IN LRVTIME
1255					34,3635	C 0006 1		EXTEND		
1256	REF	14	LAST	865	34,3636	3 0033 1		DCA	CDUX	PICK UP CDUX AND CDUY
1257	REF	5	LAST	885	34,3637	531655 1		EXCF	LRXCCL	AND SAVE IN LRXCCL AND LRYCCL
1258	REF	8	LAST	865	34,3640	3 0024 0		CA	CDUZ	
1259	REF	4	LAST	885	34,3641	551655 1		TS	LRZCCL	SAVE CDUZ IN LRZCCL
1260	REF	12	LAST	866	34,3642	3 0037 0		CA	PIPAK	
1261	REF	6	LAST	880	34,3643	551657 0		TS	PIPTEN	SAVE PIPAK IN PIPTEN
1262					34,3644	0 0006 1		EXTEND		
1263	REF	3	LAST	385	34,3645	3 0041 1		DCA	PIPAY	PICK UP PIPAY AND PIPAZ
1264	REF	7	LAST	887	34,3646	531661 0		EXCF	PIPTEN +1	AND SAVE IN PIPTEN +1 AND PIPTEN +2
1265	REF	60	LAST	854	34,3647	0 5261 1		TC	TASKCOVER	

1266					33,3632			BANK	33	
1267	REF	8	LAST	867	33,2000			SETLCC	SERVICES	
1268					33,3632			BANK		

1269	REF	8	LAST	868 TO 886:	627	825*		CCUNT*	\$/SERV	
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1270	REF	52	LAST	883	E7,1515			EBANK=	DVCNTR	
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R1271 HIGATJOB IS SET APPROXIMATELY 6 SECONDS PRIOR TO HIGH GATE DURING
 R1272 THE DESCENT BURN PHASE OF LUNAR LANDING. THIS JOB INITIATES THE
 R1273 LANDING RADAR REPOSITIONING ROUTINE AND GOES TO SLEEP UNTIL THE
 R1274 LR ANTENNA MOVES FROM POSITION 1 TO POSITION 2. IF THE LR ANTENNA
 R1275 ACHIEVES POSITION 2 WITHIN 22 SECONDS THE ALTITUDE AND VELOCITY
 R1276 BEAM VECTORS ARE RECOMPUTED TO REFLECT THE NEW ORIENTATION WITH
 R1277 RESPECT TO THE NB. BIT10 OF LRSTAT IS CLEARED TO ALLOW LR
 R1278 MEASUREMENTS AND THE JOB TERMINATES.

12781					33,3632	0 0014 0	REPEPCS	INFINIT		
12783	REF	34	LAST	886	33,3633	4 0197 0		CS	FLGWRD11	
12785	REF	12	LAST	868	33,3634	7 5015 1		MASK	PRIC3	
12787	REF	35	LAST	888	33,3635	26 107 0		ACS	FLGWRD11	
1279	REF	245	LAST	886	33,3636	0 4616 1	HIGATJOB	TC	BANKCALL	START LRFCS2 JOB
1280	REF	2	LAST	265	33,3637	53454 1		CADR	LRPOS2	
1281	REF	246	LAST	888	33,3640	0 4616 1		TC	BANKCALL	PUT HIGATJOB TO SLEEP UNTIL JOB IS DONE
1282	REF	17	LAST	896	33,3641	17706 0		CADR	RADSTALL	
1283	REF	1			33,3642	1 3655 0		TCF	POSALARM	BAD END ALARM
1284	REF	2	LAST	255	33,3643	3 7714 1	PCSGCCD	CA	PRIQ23	REDUCE PRIORITY FOR INTERPRETIVE COMPS.
1285	REF	16	LAST	828	33,3644	0 5146 1		TC	PRIQCHNG	
1286	REF	1			33,3645	0 3721 0		TC	SETPCS2	LR IN PCS2 - SET UP TRANSFORMATIONS
12862	REF	63	LAST	884	33,3646	0 5504 0		TC	UPFLAG	
12864	REF	1			33,3647	00256 0		ADRES	LPDS2FLG	
1287	REF	92	LAST	887	33,3650	0 5516 0	ENDPCS	TC	CCWNFLAG	
1288	REF	1			33,3651	00252 1		ADRES	NCLRREAD	RESET NCLRREAD FLAG TO ENABLE LR READING
12882	REF	76	LAST	868	33,3652	0 5353 1	LRPRESTR	TC	PFASCHNG	
12884					33,3653	00001 0		CCT	1	
1289	REF	138	LAST	887	33,3654	0 5155 0		TC	ENDOFJOB	
1290	REF	1			33,3655	3 3761 1	POSALARM	CA	CCT523	
1291	REF	247	LAST	888	33,3656	0 4616 1		TC	BANKCALL	
1292	REF	7	LAST	516	33,3657	21563 1		CADR	PRIOLARM	FLASH ALARM CCCE
1293	REF	1			33,3660	1 3652 1		TCF	LRPRESTR	V34-TERMINATE R12 (NOLRRBIT SET)
1294	REF	1			33,3661	1 2664 1		TCF	P1CHK	PRCEEC
1295	REF	1			33,3662	1 3672 0		TCF	P2CHK	V32E
1296	REF	129	LAST	888	33,3663	0 5155 0		TC	ENDOFJOB	
12962	*REF	64	LAST	888	33,3664	0 5504 0	P1CHK	TC	UPFLAG	
12964	*REF	1			33,3665	00261 1		ADRES	NC511FLG	
1297	*REF	45	LAST	870	33,3666	3 4746 0		CA	BIT6	
1298	REF	2	LAST	870	33,3667	0 3676 0		TC	POSTST	
1299	*REF	1			33,3670	0 2650 1		TC	ENDPCS	
1300	REF	1			33,3671	1 3643 1		TCF	PCSGCCD	ACT PCS1 - CHANGE TO PCS2
13005	REF	28	LAST	881	33,3672	3 4745 0	P2CHK	CA	BIT7	

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13007	REF	3	LAST	888	33,3673	0 3676 0	TC	POSTST	
1311	REF	2	LAST	888	33,3674	1 3643 1	TCF	PCSECCD	
13115	REF	2	LAST	888	33,3675	1 3655 0	TCF	PCSALARM	
13117					33,3676	0 0006 1	POSTST	EXTEND	
1312	REF	23	LAST	782	33,3677	02 033 0	RAND	CHAN33	
13125					33,2706	0 0006 1	EXTEND		
1313	REF	5	LAST	527	33,3701	1 6745 0	BZF	TCO	
13125	REF	4	LAST	523	33,2702	1 6742 1	TCF	G+1	
1314	REF	11	LAST	740	33,2703	0 4645 1	SETPOS1	MAKCCADR	MLST BE CALLED BY BANKCALL
1315	REF	1			33,3704	55'656 1	TS	LRADRET1	SAVE RETLRN CADR, SINCE RLF2 CLOCBERED
1316	REF	60	LAST	887	33,3705	2 4752 0	CAF	TWC	
1317	REF	4	LAST	887	33,3706	55'674 1	TS	STILBADH	INITIALIZE STILBAD
1318	REF	4	LAST	886	33,2707	55'675 1	TS	STILBADV	INITIALIZE STILRAD
1319	REF	164	LAST	881	33,3710	2 4755 1	CA	ZERO	INDEX FOR LEALPHA,LRBETA IN PCS 1.
1310	REF	5	LAST	883	33,3711	55'670 0	TS	LRICTR	SET L,M,R, AND S TO ZERO
1311	REF	5	LAST	884	33,2712	55'672 1	TS	LEMCTR	
1312	REF	4	LAST	883	33,2713	55'671 1	TS	LRRCTR	
1313	REF	4	LAST	884	33,2714	55'673 0	TS	LRSCTR	
1314	REF	11	LAST	886	33,2715	55'651 0	TS	VSELECT	INITIALIZE VSELECT
1315	REF	1			33,3716	0 3722 0	TC	SETPOS	CONTINUE WITH COMPUTATIONS
1316	REF	2	LAST	889	33,3717	3 1656 0	CA	LRADRET1	
1317	REF	14	LAST	741	33,2720	0 4640 1	TC	BANKJLMP	RETURN TO CALLER
1318	REF	61	LAST	889	33,3721	3 4752 0	SETPCS2	CA	TWC
1319	REF	221	LAST	882	33,2722	56 002 0	SETPCS	XCH	G
1320	REF	2	LAST	150	33,3723	55'650 1	TS	LRADRET	SAVE INDEX IN G
1321	REF	11	LAST	881	33,3724	2 5014 1	CA	EBANK5	SAVE RETLRN
1322	REF	45	LAST	885	33,2725	54 003 0	TS	EBANK	
1323	REF	2	LAST	123	55,1522		EBANK=	LRALPHA	
1324					33,3726	0 0006 1	EXTEND		
1325	REF	222	LAST	889	33,3727	5 0002 0	INDEX	Q	
1326	REF	3	LAST	889	33,3730	3 1523 1	DCA	LRALPHA	LRALPHA IN A, LRBETA IN L
1327	REF	22	LAST	879	33,2731	54 771 1	TS	CDLSPOT +4	ROTATION ABOUT X
1328	REF	23	LAST	889	33,3732	22 765 0	LXCH	CDLSPOT	ROTATION ABOUT Y
1329	REF	165	LAST	889	33,3733	3 4755 1	CA	ZERO	
1330	REF	24	LAST	889	33,2734	54 767 0	TS	CDLSPCT +2	ZERO ROTATION ABOUT Z.
1331	REF	13	LAST	885	33,3735	3 5016 0	CA	EBANK7	
1332	REF	46	LAST	889	33,2736	54 003 0	TS	EBANK	
1333	REF	3	LAST	889	57,1650		EBANK=	LRADRET	
1334	REF	160	LAST	882	33,3737	0 6042 1	TC	INTPRFT	
1335					33,2740	45175 0	VLOAD	CALL	

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1336	REF	5	LAST	779	33,3741	06520 0		UNITY	CONVERT UNITY(ANTENNA) TO NB
1337	REF	2	LAST	575	33,3742	47652 1		TRG*SMNB	
1338	REF	2	LAST	117	33,3743	26237 0	STOVL	VYBEAMNB	
1339	REF	11	LAST	812	33,3744	06522 1		UNITX	CONVERT UNITX(ANTENNA) TO NB
1340					33,3745	77624 1	CALL		
1341	REF	4	LAST	550	33,3746	47673 0		*SMNB*	
1342	REF	2	LAST	117	33,3747	02245 0	STORE	VXBEAMNB	
1343					33,3750	76435 1	VXV	VSL1	
1344	REF	3	LAST	890	33,3751	02237 0		VYBEAMNB	
1345	REF	3	LAST	879	33,3752	26231 0	STOVL	VZBEAMNB	Z = X * Y
1346	REF	1			33,3753	26003 0		HBEAMANT	
1347					33,3754	77624 1	CALL		
1348	REF	5	LAST	890	33,3755	47673 0		*SMNB*	CONVERT TO NB
1349	REF	2	LAST	877	33,3756	02273 0	STORE	HBEAMNB	
1350					33,3757	77776 1	EXIT		

1351	REF	4	LAST	889	33,3760	0 1650 0	TC	LRADRET
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1352					33,3761	00523 0	CCT523	CCT	00523
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[illegible]

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0048				21,2217	0 0106 1		EXTEND		CHECK POLARITY OF ALTITUDE RATE.
0049				21,2220	6 2222 1		BZMF	+2	
0050	RFF	1		21,2221	1 2224 0		TCF	DATAOUT	NEGATIVE - SEND FCS. PULSES TO ALTM REG.
0051	RFF	4	LAST	891	21,2222	3 1711 1	CA	ALTRATE	POSITIVE OR ZERO - SET SIGN BIT = 1 AND
0052	RFF	24	LAST	534	21,2223	6 4735 1	AD	BIT15	SEND TO ALTM REGISTER. *FC NOT SEND +04
0053	RFF	1			21,2224	54 060 0	DATAOUT	TS	ACTIVATE THE LANDING ANALOG DISPLAYS - -
0054	REF	21	LAST	616	21,2225	2 4751 0	CAF	BIT3	
0055					21,2226	0 0006 1	EXTEND		
0056	REF	13	LAST	891	21,2227	05 014 1	WOR	CHAN14	BIT3 DRIVES THE ALT/ALTRATE METER.
0057	RFF	61	LAST	887	21,2230	1 5261 0	TCF	TASKOVER	EXIT
0058	REF	2	LAST	891	21,2231	1 2315 1	ALTCUT	TC	CHECK MODE SELECT SWITCH AND DICFLG.
0059	RFF	21	LAST	891	21,2232	4 4745 1	CS	BIT7	
0060	RFF	29	LAST	891	21,2233	7 1300 1	MASK	IMODES33	
0061	RFF	30	LAST	892	21,2234	55 1300 1	TS	IMODES33	ALTERNATE ALTITUDE RATE WITH ALTITUDE.
0062	RFF	40	LAST	891	21,2235	4 4752 1	CS	BIT2	
0063					21,2236	0 0006 1	EXTEND		
0064	RFF	14	LAST	892	21,2237	03 014 1	WANC	CHAN14	
0065	RFF	3	LAST	871	21,2240	11 1741 0	CCS	ALTBITS	--1 IF OLD ALT. DATA TO BE EXTRAPOLATED.
0066					21,2241	1 2245 1	TCF	+4	
0067					21,2242	1 2245 1	TCF	+2	
0068	RFF	1			21,2243	1 2263 0	TCF	CLODATA	
0069	RFF	4	LAST	892	21,2244	55 1741 0	TS	ALTBITS	SET ALTBITS FROM -0 TO +0.
0070	RFF	96	LAST	875	21,2245	4 4753 0	CS	CNE	
0071	RFF	5	LAST	892	21,2246	53 1742 0	DXCH	ALTBITS	SET ALTBITS--1 FOR SWITCH USE NEXT PASS.
0072	RFF	2	LAST	152	21,2247	53 1712 1	DXCH	ALTSAVE	
0073	REF	21	LAST	775	21,2250	3 4742 1	CA	BIT10	NEW ALTITUDE EXTRAPOLATION WITH ALTRATE.
0074	RFF	223	LAST	889	21,2251	56 002 0	XCH	0	
0075					21,2252	22 007 0	LXCH	7	ZL
0076	REF	3	LAST	891	21,2253	3 1715 0	CA	DT	
0077					21,2254	0 0006 1	EXTEND		
0078	RFF	224	LAST	892	21,2255	10 002 1	CV	G	RESCALE DT*2(-14) TO *2(-9) TIME IN CS.
0079					21,2256	0 0006 1	EXTEND		
0080	RFF	1			21,2257	7 2002 0	MP	ARTQA2	.0021322 *2(+8)
0081	RFF	2	LAST	892	21,2260	1 2264 1	TCF	CLODATA +1	RATE APPLIES FOR DT CS.
0082	RFF	3	LAST	892	21,2261	53 1713 1	ZDATA2	DXCH	ALTSAVE
0083	RFF	1			21,2262	1 2304 0	TCF	NEWDATA	
0084	RFF	1			21,2263	3 2001 1	CLODATA	CA	RATE APPLIES FOR .5 SEC. (4X/SEC. CYCLE)
0085					21,2264	0 0006 1	EXTEND		
0086	RFF	5	LAST	892	21,2265	7 1711 0	MP	ALTRATE	EXTRAPOLATE WITH ALTITUDE RATE.
0087					21,2266	20 001 1	DDCURL		
0088	RFF	4	LAST	892	21,2267	6 1713 0	AD	ALTSAVE +1	
0089	RFF	5	LAST	892	21,2270	55 1713 1	TS	ALTSAVE +1	
0090	RFF	166	LAST	889	21,2271	3 4755 1	CAF	ZFPC	
0091	RFF	6	LAST	892	21,2272	27 1712 0	ADS	ALTSAVE	
0092	RFF	21	LAST	820	21,2273	3 4733 1	CAF	PCSMAX	FORCE SIGN AGREEMENT ASSUMING A
0093	RFF	97	LAST	892	21,2274	6 4753 1	AD	ONE	NON-NEGATIVE ALTSAVE.
0094	RFF	7	LAST	892	21,2275	6 1713 0	AD	ALTSAVE +1	IF ALTSAVE IS NEGATIVE, ZERO ALTSAVE
0095	RFF	9	LAST	892	21,2276	55 1713 1	TS	ALTSAVE +1	AND ALTSAVE +1 AT ZERCCATA.

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0096	REF	167	LAST	892	21,2277	3 4755 1	CAF	ZERC	
0097	REF	22	LAST	892	21,2310	6 4733 1	AD	PCSMAX	
0098	REF	9	LAST	892	21,2311	6 1712 1	AD	ALTSAVE	
0099	REF	10	LAST	893	21,2302	55'712 0	TS	ALTSAVE	PCSSIELY SKIP TO NEWDATA.
0100	REF	1			21,2303	1 3041 0	TCF	ZERODATA	
0101	REF	11	LAST	893	21,2314	11'713 1	NEWDATA CCS	ALTSAVE +1	
0102					21,2305	1 2311 1	TCF	+4	
0103					21,2316	1 2311 1	TCF	+3	
0104	REF	168	LAST	893	21,2307	3 4755 1	CAF	ZERC	SET NEGATIVE ALTSAVE +1 TO +0.
0105	REF	12	LAST	893	21,2310	55'713 1	TS	ALTSAVE +1	
0106	REF	13	LAST	893	21,2311	11'712 0	CCS	ALTSAVE	PROVIDE A 15 BIT UNSIGNED CUTPLT.
0107	REF	35	LAST	892	21,2312	3 4735 1	CAF	BIT15	THE FI-ORDER PART IS +1 OR +0.
0108	REF	14	LAST	892	21,2313	6 1713 0	AD	ALTSAVE +1	
0109	REF	2	LAST	892	21,2314	1 2224 0	TCF	DATACUT	DISPATCH UNSIGNED BITS TO ALTM REG.
0110					21,2315	0 0006 1	DISINCAT EXTEND		
0111	REF	3	LAST	823	21,2316	23'714 1	QXCF	LADQSAVE	SAVE RETURN TO ALTRCUT +1 OF ALTELT +1
0112	REF	46	LAST	888	21,2317	3 4746 0	CAF	BIT6	
0113					21,2320	1 0006 1	EXTEND		WISHEH THE ASTRONAUT THE ANALOG
0114	REF	7	LAST	824	21,2331	02 330 0	RAND	CHAN30	DISPLAYS? I.E.,
0115	REF	269	LAST	891	21,2322	10 000 0	CCS	A	IS THE MCDE SELECT SWITCH IN PGNCSS?
0116	REF	2	LAST	891	21,2323	1 3044 0	TCF	DISRSET	NO. ASTRONAUT REQUESTS NO INERTIAL DATA
0117	REF	27	LAST	794	21,2324	4 0075 1	CS	FLAGWRD1	YES. CHECK STATUS OF DIDFLAG.
0118	REF	2	LAST	218	21,2325	7 4736 0	MASK	DIDFLEIT	
0119					21,2326	0 0006 1	EXTEND		
0120	REF	1			21,2327	1 2365 1	BZF	SPEECRUN	SET. PERFORM DATA DISPLAY SEQUENCE.
0121	REF	28	LAST	893	21,2330	4 0075 1	CS	FLAGWRD1	RESET. PERFORM INITIALIZATION FUNCTIONS.
0122	REF	3	LAST	893	21,2331	7 4736 0	MASK	DIDFLEIT	
0123	REF	29	LAST	893	21,2332	26 075 1	ADS	FLAGWRD1	SET DIDFLAG.
0124	REF	32	LAST	892	21,2333	4 4745 1	CS	BIT7	
0125	REF	21	LAST	892	21,2334	7 1300 1	MASK	IMODES33	TO DISPLAY ALTRATE FIRST AND ALT. SECCNC
0126	REF	32	LAST	893	21,2335	55'700 0	TS	IMODES33	
0127	REF	25	LAST	825	21,2336	4 0074 0	CS	FLAGWRD0	ARE WE IN DESCENT TRAJECTORY?
0128	REF	2	LAST	825	21,2327	7 4752 1	MASK	RIDFLEIT	
0129					21,2341	1 0006 1	EXTEND		
0130	REF	62	LAST	892	21,2341	1 5261 0	BZF	TASKOVER	NO
0131	REF	29	LAST	801	21,2342	3 4744 1	CAF	BIT8	YES.
0132					21,2343	0 0006 1	EXTEND		
0133	REF	51	LAST	778	21,2344	05 012 1	WCR	CHAN12	SET DISPLAY INERTIAL DATA OUTBIT.
0134	REF	169	LAST	893	21,2345	3 4755 1	CAF	ZERC	
0135	REF	2	LAST	151	21,2346	55'702 1	TS	TRAKLATV	LATERAL VELOCITY MONITOR FLAG
0136	REF	2	LAST	151	21,2347	55'703 0	TS	TRAKFWDV	FORWARD VELOCITY MONITOR FLAG
0137	REF	2	LAST	151	21,2350	55'676 0	TS	LATVMETR	LATVEL MONITOR METER
0138	REF	2	LAST	151	21,2351	55'677 1	TS	FORVMETR	FORVEL MONITOR METER
0139	REF	37	LAST	830	21,2352	3 4750 1	CAF	BIT4	
0140	REF	25	LAST	846	21,2353	0 5173 1	TC	TWIDDLE	
0141	REF	1			21,2354	02356 0	ACRES	INTLZE	
0142	REF	63	LAST	893	21,2355	1 5261 0	TCF	TASKOVER	
0143	REF	41	LAST	892	21,2356	3 4752 0	CAF	BIT2	INTLZE
0144					21,2357	0 0006 1	EXTEND		
0145	REF	52	LAST	893	21,2358	05 012 1	WOR	CHAN12	ENABLE RR ERROR COUNTER.

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0146	REF	22	LAST	893	21,2361	4 1200 1	CS	IMCDES33	
0147	REF	3	LAST	893	21,2362	7 4744 0	MASK	BIT8	
0148	REF	34	LAST	894	21,2363	27 300 1	ADS	IMCDES33	SET INERTIAL DATA FLAG.
0149	REF	64	LAST	892	21,2364	1 5261 0	TCF	TASKCVER	
0150	REF	22	LAST	880	21,2365	4 1234 1	SPEEDCRN	CS	PIPTIME +1
0151	REF	14	LAST	891	21,2366	6 0025 0	AD	TIME1	UPDATE THE VELOCITY VECTOR
0152	REF	9	LAST	892	21,2367	6 4736 1	AD	HALF	COMPUTE T - TN
0153	REF	11	LAST	894	21,2370	6 4736 1	AD	HALF	CORRECT FOR POSSIBLE OVERFLOW OF TIME1.
0154	REF	4	LAST	892	21,2371	57 715 0	XCH	DT	SAVE FOR LATER USE
0155	REF	17	LAST	810	21,2372	3 4777 1	CA	1SEC	
0156	REF	8	LAST	615	21,2373	54 065 0	TS	ITEMP5	INITIALIZE FOR DIVISION LATER
0157					21,2374	0 0006 1	EXTEND		
0158	REF	11	LAST	880	21,2375	3 1236 1	CCA	GDT/2	COMPLETE THE X-COMPONENT OF VELOCITY.
0159					21,2376	20 001 1	DDOUBL		
0160					21,2377	20 001 1	DDOUBL		
0161					21,2400	0 0006 1	EXTEND		
0162	REF	5	LAST	894	21,2411	7 1715 1	MP	DT	
0163					21,2412	0 0006 1	EXTEND		
0164	REF	5	LAST	894	21,2413	10 065 0	CV	ITEMP5	
0165	REF	5	LAST	891	21,2414	57 706 1	XCH	VVECT	VVECT = (T-TN) M/CS *2(-5)
0166					21,2415	0 0006 1	EXTEND		
0167	REF	19	LAST	880	21,2416	3 1527 0	CCA	V	M/CS *2(-7)
0168					21,2417	20 001 1	DDOUBL		RESCALE TC 2(-5)
0169					21,2418	20 001 1	DDOUBL		
0170	REF	6	LAST	894	21,2411	27 706 0	ADS	VVECT	VVECT = VN + (T-TN) M/CS *2(-5)
0171	REF	13	LAST	897	21,2412	3 0037 0	CA	PIPAX	DELV CM/SEC *2(-14)
0172	REF	4	LAST	865	21,2413	6 1157 0	AD	PIPATMPX	IN CASE PIPAX HAS BEEN ZEROED
0173					21,2414	0 0006 1	EXTEND		
0174	REF	1			21,2415	7 2004 0	MP	KPIP1(5)	DELV M/CS *2(-5)
0175	REF	7	LAST	894	21,2416	27 706 0	ADS	VVECT	VVECT = VN + DELV + GN(T-TN) M/CS *2(-5)
0176					21,2417	0 0006 1	EXTEND		
0177	REF	12	LAST	894	21,2420	3 1240 0	CCA	GDT/2 +2	COMPLETE THE Y-COMPONENT OF VELOCITY.
0178					21,2421	20 001 1	DDOUBL		
0179					21,2422	20 001 1	DDOUBL		
0180					21,2423	0 0006 1	EXTEND		
0181	REF	6	LAST	894	21,2424	7 1715 1	MP	DT	
0182					21,2425	0 0006 1	EXTEND		
0183	REF	10	LAST	894	21,2426	10 065 0	CV	ITEMP5	
0184	REF	8	LAST	894	21,2427	57 707 0	XCH	VVECT +1	
0185					21,2430	0 0006 1	EXTEND		
0186	REF	20	LAST	894	21,2431	3 1521 1	CCA	V +2	
0187					21,2432	20 001 1	DDOUBL		
0188					21,2433	20 001 1	DDOUBL		
0189	REF	9	LAST	894	21,2434	27 707 1	ADS	VVECT +1	
0190	REF	4	LAST	887	21,2435	3 0040 0	CA	PIPAY	
0191	REF	4	LAST	865	21,2436	6 1160 1	AD	PIPATMPY	
0192					21,2437	0 0006 1	EXTEND		
0193	REF	2	LAST	894	21,2440	7 2004 0	MP	KPIP1(5)	
0194	REF	10	LAST	894	21,2441	27 707 1	ADS	VVECT +1	

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0195					21,2442	0 0006 1	EXTEND		
0196	REF	13	LAST	894	21,2443	3 1242 1	DCA	GCT/2 +4	COMPUTE THE Z-COMPONENT OF VFLCCITY.
0197					21,2444	20 001 1	DDOUBL		
0198					21,2445	20 001 1	DDOUBL		
0199					21,2446	0 0006 1	EXTEND		
0200	REF	7	LAST	894	21,2447	7 1715 1	MP	DT	
0201					21,2450	0 0006 1	EXTEND		
0202	REF	11	LAST	894	21,2451	10 0065 0	DV	ITEMP5	
0203	REF	11	LAST	894	21,2452	57 1710 0	XCH	VVECT +2	
0204					21,2453	0 0006 1	EXTEND		
0205	REF	21	LAST	894	21,2454	3 1533 0	DCA	V +4	
0206					21,2455	20 001 1	DDOUBL		
0207					21,2456	20 001 1	DDOUBL		
0208	REF	12	LAST	895	21,2457	27 1710 1	ADS	VVECT +2	
0209	REF	7	LAST	895	21,2458	3 0041 1	CA	PIPAZ	
0210	REF	4	LAST	895	21,2461	6 1161 0	AD	PIPATMP2	
0211					21,2462	0 0006 1	EXTEND		
0212	REF	3	LAST	894	21,2463	7 2004 0	MP	KFIP1(5)	
0213	REF	13	LAST	895	21,2464	27 1710 1	ADS	VVECT +2	
0214	REF	32	LAST	892	21,2465	3 4751 0	CAF	PIT3	PAUSE 40 MS TO LET OTHER RPTS IN.
0215	REF	9	LAST	892	21,2466	0 5224 0	TC	VAFDELAY	
0216	REF	26	LAST	893	21,2467	4 0074 0	CS	FLAGWRD0	ARE WE IN DESCENT TRAJECTORY?
0217	REF	3	LAST	893	21,2470	7 4752 1	MASK	RI/VLEIT	
0218	REF	27	LAST	893	21,2471	10 0000 0	CCS	A	
0219					21,2472	1 2474 0	TCF	+2	YES.
0220	REF	4	LAST	893	21,2473	0 1714 1	TC	LACSAVE	NO.
0221	REF	6	LAST	890	21,2474	3 1733 1	CA	DELVS	H1 X CF VELOCITY CORRECTION TERM.
0222	REF	14	LAST	895	21,2475	6 1706 1	AD	VVECT	H1 X CF UPDATED VELOCITY VECTOR.
0223	REF	35	LAST	893	21,2476	54 0061 1	TS	ITEMP1	= VX - DVX M/CS*2(-5).
0224	REF	7	LAST	895	21,2477	3 1735 1	CA	DELVS +2	Y
0225	REF	15	LAST	895	21,2500	6 1707 0	AD	VVECT +1	Y
0226	REF	11	LAST	743	21,2501	54 0062 1	TS	ITEMP2	= VY - DVY M/CS*2(-5).
0227	REF	8	LAST	895	21,2502	3 1737 0	CA	DELVS +4	Z
0228	REF	16	LAST	895	21,2503	6 1710 0	AD	VVECT +2	Z
0229	REF	10	LAST	744	21,2504	54 0063 0	TS	ITEMP3	= VZ - DVZ M/CS*2(-5).
0230	REF	36	LAST	895	21,2505	3 0061 0	CA	ITEMP1	COMPLETE VHY, VELOCITY DIRECTED ALONG THE
0231					21,2506	0 0006 1	EXTEND		Y-COORDINATE.
0232	REF	5	LAST	871	21,2507	7 1717 0	MP	UHYP	H1 X CF CROSS-RANGE HALF-LIMIT VECTOR.
0233	REF	20	LAST	891	21,2508	56 070 0	XCH	RLPTREG1	
0234	REF	12	LAST	895	21,2511	3 0062 0	CA	ITEMP2	
0235					21,2512	0 0006 1	EXTEND		
0236	REF	6	LAST	895	21,2513	7 1721 0	MP	UHYP +2	Y
0237	REF	31	LAST	895	21,2514	26 170 1	ADS	RLPTREG1	ACCELERATE PARTIAL PRODUCTS.
0238	REF	20	LAST	895	21,2515	3 0063 1	CA	ITEMP3	
0239					21,2516	0 0006 1	EXTEND		
0240	REF	7	LAST	895	21,2517	7 1723 1	MP	UHYP +4	Z
0241	REF	32	LAST	895	21,2520	26 070 1	ADS	RLPTREG1	

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0242	REF	33	LAST	895	21,2521	3 0077 0	CA	RLPTRFG1	
0243					21,2522	6 0010 1	DOCLBL		
0244	PEF	2	LAST	152	21,2523	57 17 4 0	XCH	VHY	VHY=VMF.UHYP M/CS*2(-5).
0245	REF	37	LAST	895	21,2524	3 0061 0	CA	ITEMP1	NEW COMPLETE VHZ, VELOCITY DIRECTED ALONG
0246					21,2525	0 0016 1	EXTEND		THE Z-COORDINATE.
0247	REF	4	LAST	871	21,2526	7 1725 1	MP	UHYP	HI X OF DOWN-RANGE HALF-UNIT VECTOR.
0248	REF	34	LAST	896	21,2527	56 070 0	XCH	RLPTRFG1	
0249	REF	13	LAST	895	21,2530	3 0062 0	CA	ITEMP2	
0250					21,2531	0 0006 1	EXTEND		
0251	REF	5	LAST	896	21,2532	7 1727 0	MP	UHYP +2	Y
0252	REF	35	LAST	896	21,2533	26 07 1	ADS	RLPTRFG1	ACCUMULATE PARTIAL PRODUCTS.
0253	REF	21	LAST	895	21,2534	3 0063 1	CA	ITEMP3	
0254					21,2535	0 0006 1	EXTEND		
0255	PEF	6	LAST	896	21,2536	7 1731 1	MP	UHYP +4	Z
0256	REF	36	LAST	896	21,2537	26 070 1	ADS	RLPTRFG1	
0257	REF	27	LAST	896	21,254	3 0070 0	CA	RLPTRFG1	
0258					21,2541	6 0001 1	DOUBLE		
0259	PEF	2	LAST	152	21,2542	57 1705 1	XCH	VHZ	VHZ = VMF.UHYP M/CS*2(-5).
0260	REF	7	LAST	732	21,2543	3 5015 0	CAF	EBANK6	GET SIN(ACG),COS(ACG) FROM GP MATRIX.
0261	REF	47	LAST	889	21,2544	54 003 0	TS	FRANK	
0262	REF	3	LAST	185	56,1417		EBANK=	M22	
0263	REF	4	LAST	896	21,2545	3 1417 1	CA	M22	
0264	REF	22	LAST	896	21,2546	54 063 0	TS	ITEMP2	
0265	PEF	2	LAST	150	21,2547	3 1420 0	CA	M32	
0266	PEF	3	LAST	744	21,2550	54 064 1	TS	ITEMP4	
0267	REF	14	LAST	885	21,2551	3 5016 0	CAF	EBANK7	
0268	REF	48	LAST	896	21,2552	54 063 0	TS	EBANK	
0269	REF	38	LAST	891	57,1536		EBANK=	UNIT/R/	
0270	REF	9	LAST	896	21,2553	3 0064 0	CA	ITEMP4	COMPUTE LATERAL AND FORWARD VELOCITIES.
0271					21,2554	0 0016 1	EXTEND		
0272	REF	3	LAST	896	21,2555	7 1714 1	MP	VHY	
0273	REF	38	LAST	896	21,2556	56 070 0	XCH	RLPTRFG1	
0274	REF	23	LAST	896	21,2557	3 0063 1	CA	ITEMP3	
0275					21,2560	0 0016 1	EXTEND		
0276	REF	3	LAST	896	21,2561	7 1715 0	MP	VHZ	
0277	REF	39	LAST	896	21,2562	26 070 1	ADS	RLPTRFG1	=VHY(COS)AOG+VHZ(SIN)ACG M/CS *2(-5)
0278	REF	1			21,2563	3 0063 0	CA	VELOCNV	CONVERT LATERAL VELOCITY TO BIT UNITS.
0279					21,2564	0 0006 1	EXTEND		
0280	REF	40	LAST	896	21,2565	7 0070 1	MP	RLPTRFG1	
0281					21,2566	20 001 1	DOCLBL		
0282	REF	2	LAST	151	21,2567	57 1700 1	XCH	LATVEL	LATERAL VELOCITY IN BIT UNITS *2(-14).
0283	PEF	11	LAST	896	21,2570	3 0064 0	CA	ITEMP4	COMPUTE FORWARD VELOCITY.
0284					21,2571	0 0006 1	EXTEND		
0285	REF	4	LAST	896	21,2572	7 1715 0	MP	VHZ	
0286	REF	41	LAST	896	21,2573	56 070 0	XCH	RLPTRFG1	
0287	REF	24	LAST	896	21,2574	3 0063 1	CA	ITEMP3	
0288					21,2575	0 0006 1	EXTEND		
0289	REF	4	LAST	896	21,2576	7 1704 1	MP	VHY	
0290	PEF	271	LAST	895	21,2577	4 0000 0	CS	A	
0291	REF	42	LAST	896	21,2600	26 070 1	ADS	RLPTRFG1	=VHZ(COS)ACG-VHY(SIN)AOG M/CS *2(-5).

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0292	REF	2	LAST	896	21,2601	3 2013 0	CA	VELCONV	CONVERT FORWARD VELOCITY TO BIT UNITS.
0293					21,2602	0 0006 1	EXTEND		
0294	REF	43	LAST	896	21,2603	7 0000 1	MP	FLPTREG1	
0295					21,2604	2 0011 1	CDONBL		
0296	REF	2	LAST	151	21,2605	57 0701 0	XCH	FORVEL	FORWARD VELOCITY IN BIT UNITS *2(-14).
0297	REF	1			21,2606	4 2015 1	CS	MAXVBITS	ACC.=-199.9989 FT./SEC.
0298	REF	5	LAST	615	21,2607	54 066 0	TS	ITEMP6	-547 BIT UNITS (OCTAL) AT 0.5571 FPS/BIT
0299	REF	98	LAST	892	21,2610	3 4753 1	CAF	ONE	LCCP TWICE.
0300	REF	12	LAST	895	21,2611	54 065 0	TS	ITEMP5	FORWARD AND LATERAL VELOCITY LANDING
0301	REF	12	LAST	897	21,2612	50 065 1	INDEX	ITEMP5	ANALOG DISPLAYS MONITOR.
0302	REF	3	LAST	896	21,2613	11 0700 0	CCS	LATVEL	
0303					21,2614	1 2620 0	TCF	+4	
0304	REF	1			21,2615	1 2721 0	TCF	LVLIMITS	
0305					21,2616	1 2626 0	TCF	+8D	
0306	REF	2	LAST	897	21,2617	1 2721 0	TCF	LVLIMITS	
0307	REF	14	LAST	897	21,2620	50 065 1	INDEX	ITEMP5	
0308	REF	4	LAST	897	21,2621	4 1700 0	CS	LATVEL	
0309	REF	2	LAST	897	21,2622	6 2015 0	AD	MAXVBITS	+199.9989 FT./SEC.
0310					21,2623	0 0006 1	EXTEND		
0311	REF	1			21,2624	6 2634 1	BZMF	CHKLASTY	
0312	REF	3	LAST	897	21,2625	1 2721 0	TCF	LVLIMITS	
0313	REF	15	LAST	897	21,2626	50 065 1	INDEX	ITEMP5	
0314	REF	5	LAST	897	21,2627	3 1700 1	CA	LATVEL	
0315	REF	3	LAST	897	21,2630	6 2015 0	AD	MAXVBITS	
0316					21,2631	0 0006 1	EXTEND		
0317					21,2632	6 2634 1	BZMF	+2	
0318	REF	4	LAST	897	21,2633	1 2721 0	TCF	LVLIMITS	
0319	REF	16	LAST	897	21,2634	50 065 1	CHKLASTY INDEX	ITEMP5	
0320	REF	3	LAST	893	21,2635	11 0700 0	CCS	LATVMPTR	
0321					21,2636	1 2642 1	TCF	+4	
0322	REF	1			21,2637	1 2653 1	TCF	LASTCK	
0323					21,2640	1 2647 1	TCF	+7	
0324	REF	2	LAST	897	21,2641	1 2653 1	TCF	LASTCK	
0325	REF	17	LAST	897	21,2642	50 065 1	INDEX	ITEMP5	
0326	REF	6	LAST	897	21,2643	3 1700 1	CA	LATVEL	
0327					21,2644	0 0006 1	EXTEND		
0328	REF	1			21,2645	6 2672 0	BZMF	LASTPCSY +5	
0329					21,2646	1 2653 1	TCF	+5	
0330	REF	18	LAST	897	21,2647	50 065 1	INDEX	ITEMP5	
0331	REF	7	LAST	897	21,2650	4 1700 0	CS	LATVEL	
0332					21,2651	0 0006 1	EXTEND		
0333	REF	1			21,2652	6 2700 0	BZMF	LASTNEGY +4	
0334	REF	19	LAST	897	21,2653	50 065 1	INDEX	ITEMP5	
0335	REF	3	LAST	893	21,2654	11 0702 1	CCS	TRAKLATV	
0336	REF	2	LAST	897	21,2655	1 2655 1	TCF	LASTPCSY	
0337					21,2656	1 2660 1	TCF	+2	
0338	REF	2	LAST	897	21,2657	1 2703 0	TCF	LASTNEGY	
0339	REF	20	LAST	897	21,2660	50 065 1	INDEX	ITEMP5	

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0340	RFF	8	LAST	897	21,2661	3 1700 1	CA	LATVEL
0341					21,2662	0 0006 1	EXTEND	
0342	REF	1			21,2663	6 2711 1	BZMF	NEGVMAXY
0343	RFF	1			21,2664	1 2674 1	TCF	PCSVMAXY
0344	RFF	21	LAST	897	21,2665	50 065 1	INDEX	ITEMP5
0345	REF	9	LAST	898	21,2666	3 1700 1	CA	LATVEL
0346					21,2667	0 0006 1	EXTEND	
0347					21,2670	6 2672 0	BZMF	+2
0348	REF	2	LAST	898	21,2671	1 2674 1	TCF	PCSVMAXY
0349	RFF	4	LAST	897	21,2672	4 2005 1	CS	MAXVBITS
0350	RFF	1			21,2673	1 3015 1	TCF	ZEROLSTY
0351	RFF	22	LAST	898	21,2674	50 065 1	PCSVMAXY	INDEX
0352	RFF	4	LAST	897	21,2675	4 1676 0	CS	LATVMETR
0353	RFF	5	LAST	898	21,2676	6 2005 0	AD	MAXVBITS
0354	REF	22	LAST	898	21,2677	50 065 1	INDEX	ITEMP5
0355	RFF	4	LAST	811	21,2700	56 072 1	XCH	RUPTRREG2
0356	RFF	99	LAST	897	21,2701	3 4753 1	CAF	CNF
0357	RFF	2	LAST	898	21,2702	1 2020 1	TCF	ZEPOLSTY +3
0358	REF	24	LAST	898	21,2703	50 065 1	LASTNEG	INDEX
0359	RFF	10	LAST	898	21,2704	3 1700 1	CA	LATVEL
0360					21,2705	0 0006 1	EXTEND	
0361	RFF	2	LAST	898	21,2706	6 2711 1	BZMF	NEGVMAXY
0362	RFF	6	LAST	898	21,2707	3 2005 0	CA	MAXVBITS
0363	REF	2	LAST	898	21,2710	1 3015 1	TCF	ZEPOLSTY
0364	RFF	25	LAST	898	21,2711	50 065 1	NEGVMAXY	INDEX
0365	REF	5	LAST	898	21,2712	3 1676 1	CA	LATVMETR
0366	RFF	7	LAST	898	21,2713	6 2005 0	AD	MAXVBITS
0367					21,2714	4 0000 0	CCM	
0368	RFF	26	LAST	898	21,2715	50 065 1	INDEX	ITEMP5
0369	RFF	5	LAST	898	21,2716	56 072 1	XCH	RUPTRREG2
0370	RFF	100	LAST	898	21,2717	4 4753 0	CS	CNF
0371	RFF	4	LAST	898	21,2720	1 3020 1	TCF	ZEROLSTY +3
0372	PLF	27	LAST	898	21,2721	50 065 1	LVLIMITS	INDEX
0373	REF	4	LAST	897	21,2722	11 702 1	CCS	TRAKLATV
0374	RFF	1			21,2723	1 2752 1	TCF	LATVPOS
0375					21,2724	1 2726 1	TCF	+2
0376	RFF	1			21,2725	1 2757 1	TCF	LATVNEG
0377	RFF	28	LAST	898	21,2726	50 065 1	INDEX	ITEMP5
0378	REF	6	LAST	898	21,2727	4 1676 0	CS	LATVMETR
0379					21,2730	7 0006 1	EXTEND	
0380					21,2731	6 2733 1	BZMF	+2
0381	RFF	1			21,2732	1 2766 0	TCF	NEGLMLV
0382	RFF	29	LAST	898	21,2733	50 065 1	INDEX	ITEMP5
0383	REF	11	LAST	898	21,2734	4 1700 0	CS	LATVEL
0384					21,2735	0 0006 1	EXTEND	
0385	RFF	1			21,2736	6 3011 1	BZMF	LVMINLM
0386	RFF	6	LAST	897	21,2737	6 0066 1	AD	ITEMP6
0387	RFF	30	LAST	898	21,2740	50 065 1	INDEX	ITEMP5
0388	RFF	7	LAST	898	21,2741	6 1676 1	AD	LATVMETR
0389					21,2742	0 0006 1	EXTEND	

L LANDING ANALOG DISPLAYS

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0390	REF	2	LAST	898	21,2743	6 3011 1	PZMF	LVMINLM
0391	REF	31	LAST	898	21,2744	50 065 1	INDEX	ITEMPS
0392	REF	12	LAST	898	21,2745	6 1700 1	AD	LATVEL
0393					21,2746	0 0006 1	EXTEND	
0394	REF	32	LAST	899	21,2747	5 0065 1	INDEX	ITEMPS
0395	REF	8	LAST	899	21,2750	61 1676 1	SU	LATVETR
0396	REF	5	LAST	898	21,2751	1 3015 1	TCF	ZEPOLSTY
0397	REF	33	LAST	899	21,2752	50 065 1	INDEX	ITEMPS
0398	REF	13	LAST	899	21,2753	4 1700 1	CS	LATVEL
0399					21,2754	0 0006 1	EXTEND	
0400	REF	3	LAST	899	21,2755	6 3011 1	BZMF	LVMINLM
0401					21,2756	1 2763 0	TCF	+5
0402	REF	34	LAST	899	21,2757	50 065 1	INDEX	ITEMPS
0403	REF	14	LAST	899	21,2760	3 1700 1	CA	LATVEL
0404					21,2761	0 0006 1	EXTEND	
0405	REF	4	LAST	899	21,2762	6 3011 1	PZMF	LVMINLM
0406	REF	25	LAST	899	21,2763	50 065 1	INDEX	ITEMPS
0407	REF	5	LAST	899	21,2764	4 1676 1	CS	LATVETR
0408	REF	6	LAST	899	21,2765	1 3015 1	TCF	ZEPOLSTY
0409	REF	26	LAST	899	21,2766	50 065 1	INDEX	ITEMPS
0410	REF	15	LAST	899	21,2767	3 1700 1	CA	LATVEL
0411					21,2770	0 0006 1	EXTEND	
0412	REF	5	LAST	899	21,2771	6 3011 1	PZMF	LVMINLM
0413	REF	8	LAST	898	21,2772	3 2005 0	CA	MAXVRITS
0414	REF	27	LAST	899	21,2773	50 065 1	INDEX	ITEMPS
0415	REF	17	LAST	899	21,2774	6 1676 1	AL	LATVETR
0416					21,2775	4 0000 0	COM	
0417	REF	28	LAST	899	21,2776	50 065 1	INDEX	ITEMPS
0418	REF	16	LAST	899	21,2777	6 1700 1	AD	LATVEL
0419					21,3000	0 0006 1	EXTEND	
0420	REF	6	LAST	899	21,3001	6 3011 1	PZMF	LVMINLM
0421					21,3002	0 0006 1	EXTEND	
0422	REF	35	LAST	899	21,3003	5 0065 1	INDEX	ITEMPS
0423	REF	17	LAST	899	21,3004	61 1700 1	SU	LATVEL
0424	REF	40	LAST	899	21,3005	50 065 1	INDEX	ITEMPS
0425	REF	11	LAST	899	21,3006	6 1676 1	AD	LATVETR
0426					21,3007	4 0000 0	COM	
0427	REF	7	LAST	899	21,3010	1 3015 1	TCF	ZEPOLSTY
0428	REF	41	LAST	899	21,3011	50 065 1	INDEX	ITEMPS
0429	REF	12	LAST	899	21,3012	4 1676 1	CS	LATVETR
0430	REF	42	LAST	899	21,3013	50 065 1	INDEX	ITEMPS
0431	REF	18	LAST	899	21,3014	6 1700 1	AD	LATVEL
0432	REF	43	LAST	899	21,3015	50 065 1	INDEX	ITEMPS
0433	REF	6	LAST	899	21,3016	56 172 1	XCF	PLUTREF3
0434	REF	17	LAST	899	21,3017	2 4755 1	CAF	ZEPOL
0435	REF	44	LAST	899	21,3020	50 065 1	INDEX	ITEMPS
0436	REF	5	LAST	899	21,3021	55 1702 1	TS	TRAKLATV
0437	REF	45	LAST	899	21,3022	50 065 1	INDEX	ITEMPS
0438	REF	7	LAST	899	21,3023	3 0072 1	CA	PLUTREF3
0439	REF	21	LAST	867	21,3024	6 4754 0	AD	NEG

AVCIDS +C DINC HARDWARE MALFUNCTION

L LANDING ANALOG DISPLAYS

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0440 REF 46 LAST 899 21,3025 50 765 1
 0441 REF 2 LAST 538 21,3026 54 063 0
 0442 REF 47 LAST 900 21,3027 50 765 1
 0443 REF 8 LAST 899 21,3030 3 0072 1
 0444 REF 48 LAST 900 21,3031 50 065 1
 0445 REF 13 LAST 899 21,3032 27 675 0
 0446 REF 49 LAST 900 21,3033 10 065 0
 0447 REF 1 21,3034 1 2611 1

INDEX ITEMP5
 TS COLTCMD
 INDEX ITEMP5
 CA PLFTREC3
 INDEX ITEMP5
 ADS LATVMETR
 CCS ITEMP5
 TCF VMONITOR

FIRST MONITOR FORWARD THEN LATERAL VEL.

0448 REF 1 21,3035 3 5027 0
 0449 21,3036 0 0016 1
 0450 REF 15 LAST 892 21,3037 05 014 1
 0451 REF 5 LAST 895 21,3040 7 1714 1
 0452 REF 171 LAST 899 21,3041 3 4755 1
 0453 REF 147 LAST 883 21,3042 54 001 1
 0454 REF 1 21,3043 1 2261 1

CAF BITSET
 EXTEND
 WOR CHAN14
 TC LACSAVE
 CAF ZERD
 TS L
 TCF ZDATA2

DRIVE THE X-POINTER DISPLAY.

GO TO ALTRCUT +1 OR TO ALTOUT +1
 ZERD ALTSAVE AND ALTSAVE +1 - - -
 NO NEGATIVE ALTITUDES ALLOWED.

R0455 *****

0456 REF 27 LAST 895 21,3044 4 0074 0
 0457 REF 4 LAST 895 21,3045 7 4752 1
 0458 21,3046 0 0006 1
 0459 REF 1 21,3047 1 3067 0
 0460 REF 31 LAST 894 21,3050 3 4744 1
 0461 REF 25 LAST 894 21,3051 7 1300 1
 0462 REF 272 LAST 896 21,3052 10 000 0
 0463 REF 42 LAST 893 21,3053 3 4752 0
 0464 REF 32 LAST 900 21,3054 6 4744 1
 0465 21,3055 4 0000 0
 0466 21,3056 0 0006 1
 0467 REF 52 LAST 893 21,3057 03 012 1
 0468 REF 1 21,3060 4 3067 1
 0469 REF 26 LAST 900 21,3061 7 1300 1
 0470 REF 37 LAST 900 21,3062 55 300 1
 0471 REF 4 LAST 893 21,3063 4 4736 0
 0472 REF 20 LAST 893 21,3064 7 0075 1
 0473 REF 31 LAST 900 21,3065 54 075 1
 0474 REF 65 LAST 894 21,3066 1 5261 1

DISPRSET CS FLAGWRD0
 MASK R10FLBIT
 EXTEND
 EZF ABORTCN
 CAF BIT8
 MASK IMODES33
 CCS A
 CAF BIT2
 AC BIT8
 CCM
 EXTEND
 WAND CHAN12
 CS BITS8/7
 MASK IMODES33
 TS IMODES33
 CS DIDFLAIT
 MASK FLAGWRD1
 TS FLAGWRD1
 TCF TASKOVER

ARE WE IN DESCENT TRAJECTORY?

NO.
 YES.
 CHECK IF INERTIAL DATA JUST DISPLAYED.
 YES. DISABLE RR ERROR COUNTER
 NO. REMOVE DISPLAY INERTIAL DATA

RESET INERTIAL DATA, INTERLEAVE FLAGS.

RESET CFFLAG.

R0475 *****

0476 21,3067 0020 1

BITSET/7 CCT 00300

INERTIAL DATA AND INTERLEAVE FLAGS.

0477 REF 2 LAST 538 5020

BITSET = PPI06

R0478 *****

L EINDOOW - GUIDAR INTERFACE

USER'S PAGE NO. 1 ED S3

R001 PROGRAM NAME: EINDOOW

R002 MOD NUMBER: 1 48 07 15

R003 MOD AUTHOR: KILMER

R004 OBJECTS OF MOD: 1. TO SUPPLY COMMANDS GIMPA ANGLES FOR ACUN 22.
 R005 2. TO MAINTAIN CORRECT AND CURRENT THRUST
 R006 DIRECTION DATA IN ALL MODES. THIS IS DONE BY
 R007 FETCHING FOR THE THRUST DIRECTION FILTER THE
 R008 COUNTS IN PACCS-AUTO, THE COUNTS IN ALL OTHER
 R009 MODES.
 R010 3. TO SUBSTITUTE A STOPRATE FOR THE NORMAL
 R011 AUTOPILOT COMMANDS WHENEVER
 R012 1) ACT IN PACCS-AUTO, OR
 R013 2) ENGINE IS OFF.

R014 FUNCTIONAL DESCRIPTION:

R015 EINDOOW PROVIDES THE INTERFACES BETWEEN THE VARIOUS POWERED FLITE GUIDANCE PROGRAMS
 R016 AND THE DIGITAL AUTOPILOT. THE INPUTS TO EINDOOW ARE THE THRUST COMMAND VECTOR
 R017 AND THE WINDOW COMMAND VECTOR, AND THE OUTPUTS ARE THE GIMPA ANGLE
 R018 INCREMENTS, THE COMMANDED ATTITUDE ANGLE RATES, AND THE COMMANDED
 R019 ATTITUDE LAG ANGLES (WHICH ACCOUNT FOR THE ANGLES BY WHICH THE BODY WILL
 R020 FOLLOW A RAMP COMMAND IN ATTITUDE ANGLE DUE TO THE FINITE ANGULAR
 R021 RATE AVAILABLE).

R022 THE ESTIMATED THRUST VECTOR FROM THE THRUST DIRECTION
 R023 ACCELERATION VECTOR, AND, WHEN XCVAHIF SET,
 R024 THE IM ZX, LINE WITH THE WINDOW COMMAND VECTOR.
 R025 EINDOOW LINES
 R026 LINES THE +Z AXIS OF

L GIMBALW - GUIDAR INTERFACE

LSEP'S PAGE NO. 2 EO 53

P0027 SPECIFICATIONS:

P0028 INITIALIZATION: A SINGLE INTERPRETIVE CALL TO INITCDLW IS REQUIRED
 P0029 BEFORE EACH GUIDED MANEUVER USING FINDCDLW.

P0030 CALL: INTERPRETIVE CALL TO FINDCDLW WITH THE THRUST COMMAND
 P0031 VECTOR IN MPAC. INTERPRETIVE CALL TO FINDCDLW -2 WITH
 P0032 THE THRUST COMMAND VECTOR IN UNFC/2 AND NOT IN MPAC.

P0033 RETURNS: NORMAL INTERPRETIVE IN ALL CASES

P0034 1. NORMALLY ALL AUTOPILOT CMDS ARE ISSUED.

P0035 2. IF NOT ENGCS AUTO, DO STOPRATE AND RETURN
 P0036 WITHOUT ISSUING AUTOPILOT CMDS.

P0037 3. IF ENGINE OFF, DO STOPRATE AND RETURN WITHOUT
 P0038 ISSUING AUTOPILOT CMDS.

P0039 ALARMS: P0040 IF INPUTS DETERMINE AN ATTITUDE IN GIMBAL LOCK.
 P0041 FINDCDLW DRIVES CDUXD AND CDUYD TO THE P00 VALUES,
 P0042 PUT DRIVES CDUZD ONLY TO THE GIMBAL LOCK CONE.
 P0043 P0042 IF UNFC/2 OR UNWC/2 PRODUCE OVERFLOW WHEN
 P0044 INITIALIZED USING NORMUNIT. FINDCDLW ISSUES
 P0045 STOPRATE AS ONLY INPUT TO AUTOPILOT.

P0046 INPUTS: UNFC/2 THRUST COMMAND VECTOR, NEED NOT BE SEMI-UNIT.
 P0047 UNWC/2 WINDOW COMMAND VECTOR, NEED NOT BE SEMI-UNIT.
 P0048 XCVINITE FLAG DENOTING X AXIS OVERRIDE INHIBITED.
 P0049 CSMDOCKR FLAG DENOTING CSM DOCKED.
 P0050 STEERSW FLAG DENOTING INSUFF THRUST FOR THRUST DIR FLTR.

P0052 OUTPUTS: DEICDUX,Y,Z
 P0053 CNEGAPD,+1,+2
 P0054 DEIPRPP,+1,+2
 P0055 CPHI,+1,+2 FOR NOUN22
 P0056
 P0057

P0058 DEFBITS: FINDCDLW DESTROYS SINCDUX,Y,Z AND COSCDUX,Y,Z BY
 P0059 WRITING INTO THESE LOCATIONS THE SINES AND COSINES
 P0060 OF THE CDUX'S IN ENGCS-AUTO, OR THE CDU'S OTHERWISE.

L FINDCCW - GUIDED INTERFAC

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P0061 INITIALIZATION FOR FINDCCW

0062				30,3071		BANK 30
0063	REF	1		30,3071		SETLCC ECDUW
0064				30,3071		BANK
0065	REF	2	LAST	137	56,1146	FRANK= ECDUW
0066	REF	1				COUNT* 66/ECDUW
0067				30,3071	77775 1	INITCCW VLOAD
0068	REF	12	LAST	890	30,3072	06522 1 UNITX
0069	REF	5	LAST	137	30,3072	03270 1 STORE UNFV/2
0070	REF	5	LAST	845	30,3074	03262 1 STORE UNWC/2
0071				30,3075	77616 0	EVG

R0072 FINDCCW PRELIMINARIES

0073				30,3076	77775 1	VLOAD	
0074	REF	19	LAST	845	30,3077	03254 1	UNFC/2
0075				30,3100	40200 1	FINDCCW POV	SETPD
0076	REF	5	LAST	843	30,3101	61100 1	FINDCCW
0077				30,3102	00023 0	22	INTERPRETER NOW INITIALIZED
0078				30,3103	77420 1	STG	CCS C THRU 21 FOR DIRECTION CCSINF MAT
0079	REF	2	LAST	137	30,3104	03247 0	CCDUWLSR

SAVE RETURN ADDRESS

R008 MASK FAUSKE-PINC

0081	REF	1		30,3105	3 3743 1	CA	ECDUWL	
0082	REF	49	LAST	896	30,3106	56 003 1	XCH	EPANK
0083	REF	2	LAST	137	30,3107	56 004 0	TS	ECDUWLSR
0084	REF	25	LAST	858	30,3110	3 0111 0	CA	DAPBCCLS
0085	REF	1	LAST	746	30,3111	7 4737 1	MASK	CSMDOCKD
0086	REF	273	LAST	900	30,3112	10 000 0	CCS	A
0087	REF	101	LAST	898	30,3113	3 4753 1	CA	CAF
0088	REF	2	LAST	137	30,3114	56 065 1	TS	NDXCCLW
0089	REF	1		30,3115	3 4743 0	CA	XOVINFIR	XOVINFIR MUST NOT BE BIT15
0090	REF	2	LAST	137	30,3116	56 062 0	TS	FLPALINC
0091	REF	30	LAST	902	30,3117	7 0111 1	MASK	DAPBCCLS
0092	REF	2	LAST	137	30,3118	56 061 0	TS	FLACCCW

FLACCCW = ANY PNZ NUMBER IF XOV INFIRTD

L FINDCPUW - GUIDAR INTERFACE

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PGCS2 FETCH BASIC DATA

0094				30,3121	0 0004 0	INHINT	RELINT AT PAUTNO (TC INTERPT)
0095	REF	15	LAST	887	30,3122	3 0032 1	CA CDUX
0096	REF	2	LAST	867	30,3123	54 771 1	TS CDUSPCTX
0097	REF	6	LAST	865	30,3124	3 0023 1	CA CDLY
0098	REF	2	LAST	867	30,3125	54 765 1	TS CDUSPCTX
0099	REF	9	LAST	887	30,3126	3 0024 0	CA CDUZ
0100	REF	2	LAST	867	30,3127	54 767 0	TS CDUSPCTX
0101	REF	32	LAST	892	30,3130	3 4742 1	CA BIT11
0102					30,3131	0 0006 1	EXTEND
0103	REF	8	LAST	893	30,3132	12 031 0	RAND CHAN30
0104	REF	274	LAST	903	30,3133	10 000 0	CFS A
0105	REF	1			30,3134	1 3151 0	TCF PALTAC
0106	REF	57	LAST	778	30,3135	3 4736 1	CA BIT14
0107					30,3136	0 0006 1	EXTEND
0108	REF	7	LAST	815	30,3137	12 031 1	RAND CHAN31
0109	REF	275	LAST	904	30,3140	10 000 0	CFS A
0110	REF	2	LAST	904	30,3141	1 3151 0	TCF PALTAC
0111	REF	3	LAST	903	30,3142	55 652 0	TS FLPALTAC
0112	REF	12	LAST	522	30,3143	3 1635 0	CA CDUXC
0113	REF	3	LAST	904	30,3144	54 771 1	TS CDUSPCTX
0114	REF	2	LAST	522	30,3145	3 1635 0	CA CDUYC
0115	REF	2	LAST	904	30,3146	54 765 1	TS CDUSPCTX
0116	REF	1	LAST	521	30,3147	3 1637 1	CA CDUZC
0117	REF	2	LAST	904	30,3150	54 767 0	TS CDUSPCTX

PGCS2 CONTROL BIT

ACT PGCS (BITS INVERTED)

AUTO MODE BIT

ACT AUTO (BITS INVERTED)

RESET FLAG PGCS AUTO ACT

PGCS AUTO: FETCH CDUXC,CDLYD,CDUZD

L FINDCMDW - OUTPAC INTERFACE

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R0118 FETCH INFLTS

0119	RFF	161	LAST	885	30,3151	0 6042 1	PALINE	TC	INTPRCT	ENTERING THRUST CMD STILL IN MPAC
0120					30,3152	77634 1		PTB		
0121	RFF	5	LAST	886	30,3153	21727 0			NCPMUNIT	
0122	RFF	1			30,3154	24701 1		STOVL	UNX/2	SEMI-UNIT THRUST CMD AS INITIAL UNX/2
0123	RFF	10	LAST	883	30,3155	13262 1			UNWC/2	
0124					30,3156	47034 0		PTB	PTP	
0125	RFF	10	LAST	885	30,3157	21727 0			NCPMUNIT	
0126	RFF	4	LAST	874	30,3158	47617 1			QUICITIG	ALWAYS EQD TO OBTAIN TRIGS OF COLD'S
0127	RFF	1			30,3161	24715 0		STOVL	UNX/2	SEMI-UNIT WINCCW CMD AS INITIAL UNX/2
0128	RFF	9	LAST	875	30,3162	12325 0			DELV	
0129					30,3163	52414 1		BCVR	UNIT	
0130	RFF	1			30,3164	61725 1			NCATTENT	AT LEAST ONE ENTERING CMD NOT ZERO
0131					30,3165	45710 1		POV	EXIT	
0132	RFF	1			30,3166	612 2			*STPFILTR	IF UNIT DELV OVERFLOWS, SKIP FILTER
0133	RFF	7	LAST	890	30,3167	47573 0			*SMPL*	YIELDS UNIT(DELV) IN VEH CCCRES FOR FLTR

R0134 THRUST DIRECTION FILTER

0135					30,3170	77776 1			EXIT	
0136	RFF	1			30,3171	3 1671 0		CA	UNFVZ/2	FOR RESTARTS, UNFVZ/2 ALWAYS INTACT, MPAC
0137	RFF	361	LAST	882	30,3172	22 157 1		LXCH	MPAC	+3 RENEWED AFTER RETURN FROM CALLER,
0138	RFF	1			30,3173	0 3470 1		TC	FLTRSLR	TWO FILTER UPDATES MAY BE DONE.
0139	RFF	2	LAST	905	30,3174	551671 1		TS	UNFVZ/2	UNFVZ/2 NEED NOT BE EXACTLY SEMI-UNIT.
0140	RFF	1			30,3175	3 1673 1		CA	UNFVZ/2	
0141	RFF	361	LAST	905	30,3176	22 161 1		LXCH	MPAC	+F
0142	RFF	2	LAST	905	30,3177	0 3470 1		TC	FLTRSLR	
0143	RFF	2	LAST	905	30,3178	551673 1		TS	UNFVZ/2	
0144	RFF	162	LAST	905	30,3201	0 6042 1		TC	INTPRCT	COMPLETES FILTER

L WINDOW - OUTCAR INTERFACE

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P0145 FIND A SUITABLE WINDOW PRINTING VECTOR

0146				30,222	46135	1	ARTEFLTE	SLOCAT	RF1Z	IF XCV ACT INHIBITED, GO FETCH ZNB
0147	REF	3	LAST	913	30,223	3252	1		FLAGGOOD	
0148	REF	1			30,224	6121	0		FETCHZNB	
0149					30,225	45175	0	VLOAD	CALL	
0150	REF	2	LAST	915	30,226	60015	0		UNZ/2	
0151	REF	1			30,227	61510	1		UNWCTEST	

0152					30,228	77775	1	FETCHZNB	VLOAD	
0153	REF	1			30,229	02162	0		ZNBPIP	
0154	REF	3	LAST	916	30,230	24015	1	STCALL	UNZ/2	
0155	REF	2	LAST	916	30,231	6151	1		UNWCTEST	

0156					30,234	57575	1	VLOAD	VCCMP	Z AND -X CAN'T BOTH PARALLEL UNFC/2
0157	REF	11	LAST	877	30,235	02146	0		XNAPIF	
0158	REF	4	LAST	916	30,236	00015	0	STORE	UNZ/2	

R0159 COMPLETE THE REQUIRED DIRECTION COSINE MATRIX

0160					30,237	47375	0	DCMCL	VLOAD	VXV	
0161	REF	5	LAST	916	30,238	00015	0			UNZ/2	
0162	REF	2	LAST	916	30,239	10001	0			UNX/2	
0163					30,240	41456	0	UNIT	PLSH		UNY/2 FIRST ITERATION
0164					30,241	76435	1	VXV	VSL1		
0165	REF	2	LAST	916	30,242	00001	0			UNX/2	
0166	REF	6	LAST	916	30,243	00015	0	STOPF	UNZ/2		-UNZ/2 FIRST ITERATION
0167					30,244	63351	0	VXSC	PCVL		EXCHANGE -UNFVZ/2 UNZ/2 FOR UNY/2
0168	REF	3	LAST	916	30,245	02274	0		UNFVZ/2		MUST BE SMALL
0169					30,246	51361	1	VXSC	RVSU		YIELDS -UNFVY/2 UNY/2-UNFVZ/2 UNZ/2
0170	REF	3	LAST	916	30,247	02272	0		UNFVY/2		MUST BE SMALL
0171					30,248	53372	1	VSL1	VAD		
0172	REF	4	LAST	916	30,249	00001	0			UNX/2	
0173					30,250	77656	1	UNIT			TOTALLY ELIMINATES THE LAST PRINTING ERROR
0174	REF	5	LAST	916	30,251	00001	0	STORE	UNX/2		UNX/2
0175					30,252	76435	1	VXV	VSL1		
0176	REF	7	LAST	916	30,253	00015	0			UNZ/2	-UNZ/2 WAS STORED HERE REMEMBER
0177	REF	1			30,254	00017	0	STORE	UNY/2		UNY/2
0178					30,255	47276	1	VCCMP	VXV		
0179	REF	6	LAST	916	30,256	00011	0			UNX/2	
0180					30,257	77772	0	VSL1			
0181	REF	8	LAST	916	30,258	00015	0	STORE	UNZ/2		UNZ/2

L FINDCDW - GUIDAR INTERLOCK

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P0182 COMPUTE THE REQUIRED GIMBAL ANGLES

0183 30,3245 77624 1
 0184 REF 1 30,3246 61521 1
 0185 30,3247 77776 1

CALL

NR20FUSP

YIELDS THE REQ GIMBAL ANGLES, 2'S, FI

EXIT

R0186 LIMIT THE MINIMUM GIMBAL ANGLE & COMPUTE THE UNLIMITED GIMBAL ANGLE CHGS

0187 REF 362 LAST 907 30,3250 3 0156 0
 0188 REF 146 LAST 907 30,3251 54 011 1
 0189 REF 1 30,3252 3 3760 0
 0190 REF 1 30,3253 3 3714 0
 0191 REF 363 LAST 907 30,3254 56 156 1
 0192 30,3255 0 0006 1
 0193 REF 364 LAST 907 30,3256 20 156 1
 0194 30,3257 0 0006 1
 0195 30,3258 1 3262 0
 0196 REF 1 30,3261 1 3743 0

CA

MFAC

+2

LIMIT THE MGA

TS

L

CAN'T EXCH: NEED UNLIMITED MGA FOR ALARM

CA

CDLZCLIM

TC

LIMITSUB

YIELDS LIMITED MGA. 1 PIT ERROR POSSIBLE
BECAUSE USING 2'S COMP. WFC CARES?

XCH

MPAC

+2

EXTEND

MSL

MFAC

+2

THIS BETTER YIELD ZERO

EXTEND

EZF

+2

TCF

ALARM MGA

0197 30,3262 0 0004 0

MGARET

INFINT

RELINT AT TC INTERPRET AFTER TCCCDW

0198 30,3263 22 007 0

ZL

0199 REF 62 LAST 989 30,3264 3 4752 0

CA

TWP

0200 REF 4 LAST 989 30,3265 54 142 1

DELGMELP

TS

TFM2

0201 REF 149 LAST 907 30,3266 3 5001 0

CA

L

TO PREVENT FALSE STARTS ABOUT X, ZERO
FLAGCDW IF DELGMELP (OR Y TOO BIG).

0202 30,3267 0 0006 1

EXTEND

SQUARE

0203 30,3270 7 0010 0

AD

HIS

WITHIN 1 PIT OF -(45 DEG SQUARED)

0204 REF 5 LAST 417 30,3271 6 4250 0

EXTEND

EZF

+3

0205 30,3272 0 0006 1

CA

ZSRD

0206 REF 172 LAST 907 30,3273 6 3276 1

TS

FLAGCDW

0207 30,3274 3 4755 1

0208 REF 4 LAST 906 30,3275 55 1651 0

INDEX

TFM2

0209 REF 5 LAST 907 30,3276 50 142 0

CA

MPAC

0210 REF 6 LAST 907 30,3277 50 142 0

INDEX

TFM2

0211 REF 1 LAST 521 30,3280 54 321 0

TS

CPHI

CUTOUTS TO ACUN22

0212 30,3282 0 0006 1

EXTEND

INDEX

TFM2

0213 REF 7 LAST 907 30,3283 50 142 0

MSL

CDLXO

NO MATTER THAT THESE SLIGHTLY DIFFERENT
FROM WHEN WE INITIALLY FETCHED THEM

0214 REF 14 LAST 904 30,3284 21 1635 1

COM

0215 30,3285 4 0007 0

INDEX

TFM2

0216 REF 8 LAST 907 30,3286 50 142 0

TS

-DELGMELP

0217 REF 1 LAST 907 30,3287 55 1675 0

TS

L

FOR PRECEDING TEST ON NEXT LCCP PASS

0218 REF 15 LAST 907 30,3288 54 001 1

TS

0219 REF 9 LAST 907 30,3289 10 142 1

CCS

TFM2

0220 REF 1 LAST 907 30,3290 1 3265 1

TCF

DELGMELP

L FINDORUK - GUIDAR INTERF

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P0227 FRANCHES TO NCATTONT

0223 REF 4 LAST 904 30,3313 11'652 0

0224 REF 2 LAST 905 30,3314 1 3737 0

0225 REF 28 LAST 987 30,3315 2 0101 1

0226 REF 6 LAST 925 30,3316 7 4745 1

0227 REF 30,3317 0 0006 1

0228 REF 3 LAST 908 30,332 1 3737 0

CCS FLPAUTNO

TCF NCATTONT +2

ACT PACCS AUTO

CA FLAGWRDS

MASK ENGNBFT

EXTEND

PZF NCATTONT +2

ENGINE ACT EN

L FINCCELW - GIMBAL INTERFAC

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E6 S3

P0229 LIMIT THE ATTITUDE ANGLE CHANGES

R0230 THIS ACTION LIMITS THE ATTITUDE ANGLE CHANGES ABOUT A SET OF ORTHOGONAL VEHICLE AXES X, YPRIME, ZPRIME.
 R0232 THESE AXES COINCIDE WITH THE COMMANDER VEHICLE AXES IF AND ONLY IF CDUXD IS ZERO. THE PRIME SYSTEM IS
 R0234 THE COMMANDER VEHICLE SYSTEM ROTATED ABOUT THE X AXIS TO BRING THE Z AXIS INTO ALIGNMENT WITH THE MIDDLE GIMBAL
 R0236 AXIS. ATTITUDE ANGLE CHANGES IN THE PRIME SYSTEM ARE RELATED TO SMALL GIMBAL ANGLE CHANGES BY:

R0238 * -DELATTX * * 1 SIN(CDUZE) * * * -DELGMBX *
 R0239 * * * * * * * * * *
 R0241 * -DELATTYPRIME * * 1 COS(CDUZE) * * * -DELGMBY *
 R0242 * * * * * * * * * *
 R0243 * -DELATTZPRIME * * * 1 * * -DELGMBZ *

0243 REF 2 LAST 907 30,3321 23,677 0 LXCF -DELGMB +2 SAME AS -DELATTZPRIME UNLIMITED
 0244 REF 2 LAST 903 30,3322 51,650 0 INDEX NEXCELW
 0245 REF 1 20,3323 3 2754 1 CA DAXMAX
 0246 REF 2 LAST 907 30,3324 0 3714 0 TC LIMITSUB
 0247 REF 3 LAST 909 30,3325 55,677 1 TS -DELGMB +2 -DELGMBZ

0248 REF 4 LAST 909 30,3326 3 1676 1 CA -DELGMB +1
 0249 30,3327 0 02,6 1 EXTEND
 0250 REF 3 LAST 400 30,3328 7 0745 1 MP CFCOLZ YIELDS -DELATTYPRIME/2 UNLIMITED
 0251 REF 151 LAST 907 30,3331 54 071 1 TS L
 0252 REF 4 LAST 909 30,3332 51,650 0 INDEX NEXCELW
 0253 REF 1 30,3333 3 2756 0 CA DAY/2MAX
 0254 REF 3 LAST 909 30,3334 0 3714 0 TC LIMITSUB
 0255 30,3335 0 02,6 1 EXTEND
 0256 REF 4 LAST 909 30,3336 10 745 1 BV CFCOLZ
 0257 REF 5 LAST 909 30,3337 57,675 1 XCF -DELGMB +1 -DELGMBY, FETCHING UNLIMITED VALUE

0258 30,3340 0 02,6 1 EXTEND
 0259 REF 3 LAST 400 30,3341 7 0737 0 MP SINCOLZ
 0260 30,3342 20 071 1 CFCOLZ
 0261 30,3343 4 0700 1 COM
 0262 30,3344 0 02,6 1 EXTEND
 0263 REF 6 LAST 909 30,3345 21,675 0 MSU -DELGMB YIELDS +DELATTX UNLIMITED, MAG < 180 DEG,
 0264 REF 152 LAST 909 30,3346 54 071 1 TS L BASED ON UNLIMITED DELGMBY.
 0265 REF 6 LAST 909 30,3347 51,650 0 INDEX NEXCELW ONE BIT ERROR IF CFFRANS IN MSU
 0266 REF 1 30,3350 3 2754 1 CA DAXMAX OF MIXED SIGNS. WHO CARES?
 0267 REF 4 LAST 909 30,3351 0 3714 0 TC LIMITSUB
 0268 REF 7 LAST 909 30,3352 55,675 0 TS -DELGMB
 0269 REF 5 LAST 907 30,3353 11,650 0 CCS FLGCECW SAVE LIMITED +DELATTX
 0270 REF 9 LAST 909 30,3354 4 1675 0 CS -DELGMB
 0271 REF 9 LAST 909 30,3355 55,675 0 TS -DELGMB
 0272 REF 10 LAST 909 30,3356 4 1676 0 CS -DELGMB +1
 0273 30,3357 0 02,6 1 EXTEND
 0274 REF 4 LAST 909 30,3360 7 0737 0 MP SINCOLZ
 0275 30,3361 20 071 1 CFCOLZ
 0276 REF 11 LAST 909 30,3362 27,675 0 ADS -DELGMB
 A0277

YIELDS -CONTRIB TO -DELATTX FROM -DELGMBY
 -DELGMBX. NO OVERFLOW SINCE LIMITED TO
 20DEG(1+SIN(75DEG)/COS(75DEG)) < 180DEG

L FINDCDUW - GUIDAR INTERFACE

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P0278 COMPLETE COMMANDER ATTITUDE RATES

```

P0279 * OMEGARD * * -2 -4 SINCDUX +0 * * -DELGMBX *
P0280 * * * * * * * * * *
P0281 * OMEGARD * = * +0 -8 COSCDUX COSCDUX -4 SINCDUX * * -DELGMBY *
P0282 * * * * * * * * * *
P0283 * OMEGARD * * +0 +8 COSCDUX SINCDUX -4 COSCDUX * * -DELGMBZ *

```

P0284 ATTITUDE ANGLE RATES IN UNITS OF $\pi/4$ RAD/SEC = K TRIG FCNS IN UNITS OF 2 X GIMBAL ANGLE RATES IN UNITS OF $\pi/2$ RAD/SEC. THE CONSTANTS ARE BASED ON DELCMB BEING THE GIMBAL ANGLE CHANGES IN UNITS OF π RADIANS, AND 2 SECONDS BEING THE COMPLETION PERIOD (THE PERIOD BETWEEN SUCCESSIVE PASSES THRU FINDCDUW).

P0290	REF	12	LAST	909	30,2353	4 1675 0	CS	-DELGMB	
P0291	REF	6	LAST	370	30,2364	55'643 0	TS	OMEGARD	
P0292	REF	13	LAST	910	30,2365	4 1676 0	CS	-DELGMB	+1
P0293					30,2366	0 0006 1	EXTEND		
P0294	REF	5	LAST	909	30,2367	7 0737 0	MP	SINCDUX	
P0295					30,2370	2 0011 1	DOUBL		
P0296	REF	7	LAST	910	30,2371	27'643 0	ADS	OMEGARD	
P0297	REF	8	LAST	910	30,2372	27'643 0	ADS	OMEGARD	
P0298	REF	14	LAST	910	30,2373	4 1676 0	CS	-DELGMB	+1
P0299					30,2374	0 0006 1	EXTEND		
P0300	REF	4	LAST	480	30,2375	7 0747 1	MP	COSCDUX	
P0301					30,2376	2 0011 1	DOUBL		
P0302					30,2377	0 0006 1	EXTEND		
P0303	REF	5	LAST	909	30,2400	7 0745 0	MP	COSCDUX	
P0304	REF	2	LAST	370	30,2401	55'644 1	TS	OMEGARD	
P0305	REF	15	LAST	910	30,2402	4 1677 1	CS	-DELGMB	+2
P0306					30,2402	0 0006 1	EXTEND		
P0307	REF	3	LAST	480	30,2404	7 0741 1	MP	SINCDUX	
P0308	REF	3	LAST	910	30,2405	27'644 1	ADS	OMEGARD	
P0309	REF	4	LAST	910	30,2406	27'644 1	ADS	OMEGARD	
P0310	REF	5	LAST	910	30,2407	27'644 1	ADS	OMEGARD	
P0311	REF	16	LAST	910	30,2410	3 1676 1	CA	-DELGMB	+1
P0312					30,2411	0 0006 1	EXTEND		
P0313	REF	4	LAST	910	30,2412	7 0741 1	MP	SINCDUX	
P0314					30,2413	20 0011 1	DOUBL		
P0315					30,2414	0 0006 1	EXTEND		
P0316	REF	6	LAST	910	30,2415	7 0745 0	MP	COSCDUX	
P0317	REF	2	LAST	370	30,2416	55'645 0	TS	OMEGARD	
P0318	REF	17	LAST	910	30,2417	4 1677 1	CS	-DELGMB	+2
P0319					30,2420	0 0006 1	EXTEND		
P0320	REF	5	LAST	910	30,2421	7 0747 1	MP	COSCDUX	
P0321	REF	3	LAST	910	30,2422	27'645 0	ADS	OMEGARD	
P0322	REF	4	LAST	910	30,2423	27'645 0	ADS	OMEGARD	
P0323	REF	5	LAST	910	30,2424	27'645 0	ADS	OMEGARD	

L FINECOW - CULAP INTERFACE

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P0324 FINAL TRANSFER

0325	REF	62	LAST	907	30,3425	3 4752 0	CA	TWC	
0326	REF	1	LAST	907	30,3426	54 142 1	TS	TEM2	
0327	REF	11	LAST	911	30,3427	5 142 0	INDEX	TEM2	
0328	REF	18	LAST	910	30,3430	3 1675 1	CA	-DELGMP	
0329					30,3431	0 0 76 1	EXTEND		
0330	REF	1			30,3432	7 3761 0	MP	DT/DELT	RATIO OF GAP INTERVAL TO CDLW INTERVAL
0331	REF	1			30,3433	0 3730 0	TC	CANSTC2S	
0332	REF	12	LAST	911	30,3434	50 142 0	INDEX	TEM2	
0333	REF	4	LAST	137	30,3435	55 560 0	TS	DELCEUX	ANGLE INTERFACE
0334	REF	12	LAST	911	30,3436	50 142 0	INDEX	TEM2	
0335	REF	5	LAST	910	30,3437	11 643 0	CCS	OMEGAPOD	
0336	REF	12	LAST	903	30,3440	6 4753 1	AD	ONE	
0337					30,3441	1 2442 0	TCF	+2	
0338	REF	103	LAST	911	30,3442	0 4753 1	AD	ONE	
0339					30,3443	0 0006 1	EXTEND		WE NOW HAVE ABS(OMEGAPOD,OD,RO)
0340	REF	14	LAST	911	30,3444	5 1142 0	INDEX	TEM2	
0341	REF	10	LAST	911	30,3445	7 1643 0	MP	OMEGAPOD	
0342					30,3446	0 0006 1	EXTEND		
0343	REF	22	LAST	744	30,3447	7 4741 0	MP	BIT11	1/16
0344					30,3450	0 0006 1	EXTEND		
0345	REF	15	LAST	911	30,3451	5 0142 1	INDEX	TEM2	²
0346	REF	6	LAST	368	30,3452	11 531 1	CV	1JACC	UNITS PI/4 RAD/SEC
0347	REF	153	LAST	909	30,3453	54 011 1	TS	L	
0348	REF	1			30,3454	3 3756 0	CA	DELERLIM	
0349	REF	5	LAST	905	30,3455	0 3714 0	TC	LIMITSUP	
0350	REF	16	LAST	911	30,3456	50 142 0	INDEX	TEM2	
0351	REF	3	LAST	370	30,3457	55 274 0	TS	DELPEPQR	LAG ANGLE = OMEGA ABS(OMEGA)/2 ACCEL
0352	REF	17	LAST	911	30,3458	11 142 1	CCS	TEM2	
0353	REF	1			30,3461	1 2426 0	TCF	CDLWXR	

R0354 HALSKOPING AND RETURN

0355	REF	3	LAST	903	30,3462	3 1646 1	TCQCDLW	CA	ECPUWXR	
0356	REF	5	LAST	903	30,3463	54 003 0	TS	FRANK	RETURN USER'S EBANK	
0357	REF	163	LAST	905	30,3464	0 6042 1	TC	INTPRET		
0358					30,3465	52001 1	SETPD	GCTC		
0359					30,3466	00001 0		C		
0360	REF	3	LAST	903	30,3467	02247 0		GCEUWXR	NORMAL AND ABNORMAL RETURN TO USER	

L FINDCOM - GUIDAR INTERFACE

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P0361 THRUST VECTOR FILTER SUBROUTINE

0362				30,3470	0 0006 1	FLTRSLR	EXTEND	
0363	REF	18	LAST	911	30,3471	22 142 0	QXCH	TEM2
0364	REF	2	LAST	98	30,3472	54 143 0	TS	TEM3
0365				30,3473	4 0000 0	CCM		
0366	REF	154	LAST	911	30,3474	6 0011 0	AC	L
0367				30,3475	0 0016 1	EXTEND		
0368	REF	6	LAST	909	30,3476	5 145 0	INDEX	NDXCDLW
0369	REF	1			30,3477	7 3747 1	MP	GAINFLTR
0370	REF	155	LAST	912	30,3510	54 001 1	TS	L
0371	REF	1			30,3511	3 3751 1	CA	DCLAEVLIM
0372	REF	6	LAST	911	30,3512	0 3714 0	TC	LIMITSUB
0373	REF	4	LAST	912	30,3513	6 0143 1	AD	TEM3
0374	REF	156	LAST	912	30,3514	54 001 1	TS	L
0375	REF	1			30,3515	3 2752 1	CA	UNEVLIM
0376	REF	7	LAST	912	30,3516	1 2714 0	TC	LIMITSUB
0377	REF	19	LAST	912	30,3517	0 1142 0	TC	TEM2

SAVE ORIGINAL OFFSET
ONE MCT, NO WCS, CAN BE SAVED IF NEG OF
CRIG OFFSET ARRIVES IN A, BUT IT'S
NOT WORTH THE INCREASED OBSCURITY.

INCR TO OFFSET, UNLIMITED
SAME LIMIT FOR Y AND Z
YIELDS INCR TO OFFSET, LIMITED
ORIGINAL OFFSET
TOTAL OFFSET, UNLIMITED
SAME LIMIT FOR Y AND Z
YIELDS TOTAL OFFSET, LIMITED

R0378 SUBR TO TEST THE ANGLE BETWEEN THE PROPOSED WINDOW AND THRUST CMD VCTS

0379				30,3510	63441 0	UNWCTEST	DOT	DSQ
0380	REF	7	LAST	906	30,3511	00001 0		UNX/2
0381				30,3512	50025 0		PSL	BMM
0382	REF	1			30,3513	21754 1		DOTSWEMX
0383	REF	1			30,3514	61217 1		DCMCL
0384				30,3515	42531 1		SSP	RVQ
0385	REF	1	LAST	909	30,3516	03252 1		FLAGOODW
0386				30,3517	00001 1			

RVQ FOR ALT CHOICE IF ECT MAGN TOO LARGE
ZORCING WINDOW GOOD FLAG

L FINANCE - OUTCAP INTERAC

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E6 S3

0387 NB2CDLSP RETURNS THE 2'S COMPLEMENT, FI, SF CCL ANGLES X,Y,Z IN MPAC,+1,+2 GIVEN THE MATRIX WHOSE ROW VECTORS
 0389 ARE THE SEMI-UNIT NAV BASE VECTORS X,Y,Z EXPRESSED IN STABLE MEMBER COORDINATES, LOCATED AT 0 IN THE PUSH LIST.

0391 NB2CDLSP USES ARCTCSP WHICH HAS A MAXIMUM ERROR OF +4 BITS.

0392				30,3520	62545 0	NP2CDLSP FLOAD	ESC		
0393				30,3521	01113 1		2		
0394				30,3522	51721 0		RDSU	RFL	
0395	REF	6	LAST	651	30,3522	06514 1		DE1/4TH	
0396				30,3524	61527 0			+3	
0397				30,3525	77745 1		FLOAD		
0398	REF	16	LAST	803	30,3526	06524 1		ZEROVCS	IN CASE SIN WAS SLIGHTLY > 1/2
0399				30,3527	77565 1		SORT	EXIT	YIELDS COS(COLZ) IN UNITS OF 2
0400				30,3530	00006 1		EXTEND		
0401	REF	366	LAST	907	30,3531	30155 1	PCA	MPAC	
0402				30,3532	20111 1		CCUPL		
0403	REF	3	LAST	98	30,3533	54145 0	TS	TEMP	
0404				30,3534	13537 1		TCF	+2	
0405	REF	23	LAST	892	30,3535	34733 1	CA	PCSMAX	OVERFLOW. FETCH POSMAX, MPAC ALWAYS PCS
0406	REF	4	LAST	913	30,3536	54145 0	TS	TEMP	COS(COLZ) IN TEMP, UNITS 1
0407	REF	29	LAST	879	30,3537	50120 1	INDEX	FIXLOC	
0408				30,3540	30002 0		CA	2	
0409	REF	367	LAST	912	30,3541	22154 1	LXCH	MPAC	
0410	REF	1			30,3542	03407 0	TC	ARCTPCSP	
0411	REF	368	LAST	912	30,3542	54156 1	TS	MPAC	+2 COLZ
0412	REF	173	LAST	907	30,3544	34755 1	CA	ZERO	
0413	REF	1			30,3545	03565 1	TC	DVRYCCSV	
0414	REF	21	LAST	854	30,3546	34751 0	CA	FCLR	
0415	REF	2	LAST	913	30,3547	33565 1	TC	DVRYCCSM	
0416	REF	9	LAST	337	30,3550	40141 1	CS	TEMP	
0417	REF	2	LAST	913	30,3551	03617 0	TC	ARCTGSP	
0418	REF	369	LAST	912	30,3552	54155 1	TS	MPAC	+1 CPLY
0419	REF	38	LAST	892	30,3553	34750 1	CA	FIT4	
0420	REF	3	LAST	912	30,3554	13565 1	TC	DVRYCCSM	
0421	REF	1			30,3555	23564 0	CA	16CCT	
0422	REF	4	LAST	912	30,3556	03565 1	TC	DVRYCCSV	
0423	REF	12	LAST	512	30,3557	40141 1	CS	TEMP	
0424	REF	3	LAST	912	30,3558	03627 0	TC	ARCTPCSP	
0425	REF	370	LAST	913	30,3561	54154 0	TS	MPAC	COLX
0426	REF	164	LAST	511	30,3562	06742 1	TC	INTERST	
0427					30,3563	77616 1	RVC		
0428					30,3564	00216 0	16CCT	OCT	16

L FINDCCLK - GUIDAP INTERFACE

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R0429 THE ELEMENTS OF THE NAV BASE MATRIX WHICH WE MUST DIVIDE BY CCS(MGA)
 R0430 ALREADY CONTAIN CCS(MGA)/2 AS A FACTOR. THEREFORE THE QUOTIENT SHOULD
 R0431 ORDINARILY NEVER EXCEED 1/2 IN MAGNITUDE. BUT IF THE MGA IS NEAR $\pi/2$
 R0432 THEN CCS(MGA) IS NEAR ZERO, AND THERE MAY BE SOME CHAFF IN THE OTHER
 R0433 ELEMENTS OF THE MATRIX WHICH WOULD PRODUCE CHAFS UNDER DIVISION.
 R0434 BEFORE DIVIDING WE MAKE SURE CCS(MGA) IS AT LEAST ONE BIT LARGER
 R0435 THAN THE MAGNITUDE OF THE HIGH ORDER PART OF THE OPERAND.

R0436 IF ONE OR MORE DIVIDES CANNOT BE PERFORMED, THIS MEANS THAT THE
 R0437 REQUIRED MGA IS VERY NEARLY $+\pi/2$ AND THEREFORE THE OTHER GIMBAL
 R0438 ANGLES ARE INDETERMINATE. THE INNER AND OUTER GIMBAL ANGLES RETURNED
 R0439 IN THIS CASE WILL BE RANDOM MULTIPLES OF $\pi/2$.

0440	REF	30	LAST	913	30,3565	6 0120 1	DVBYCOSM	AD	FIXLOC	
0441	REF	1			30,3566	54 116 0		TS	ADDRWD	ACRES OF OPERAND
0442	REF	2	LAST	914	30,3567	50 116 1		INDEX	ADDRWD	FETCH NEG ABS OF OPERAND, AC TEM5, AND
0443					30,3570	3 0000 1		CA	0	SKIP DIVIDE IF RESULT NEG OR ZERO
0444					30,3571	0 0006 1		EXTEND		
0445					30,3572	6 2574 1		BZMF	+2	
0446					30,3573	4 0000 0		COM		
0447	REF	5	LAST	913	30,3574	6 0145 1		AD	TEM5	C(A) ZERO OR NEG, C(TEM5) ZERO OR POS
0448					30,3575	0 0006 1		EXTEND		
0449	REF	1			30,3576	6 3604 0		EZMF	TS&TQC	DIFFERENCE ALWAYS SMALL IF BRANCH
0450					30,3577	0 0006 1		EXTEND		
0451	REF	3	LAST	914	30,3600	5 0116 1		INDEX	ADDRWD	TEM5 EXCEEDS ABS HIGH ORDER PART OF
0452					30,3601	2 0001 0		DCA	0	OPERAND BY AT LEAST ONE BIT.
0453					30,3602	0 0006 1		EXTEND		THEREFORE IT EXCEEDS THE DP OPERAND
0454	REF	6	LAST	914	30,3603	10 145 0		CV	TEM5	AND DIVISION WILL ALWAYS SUCCEED.
0455	REF	157	LAST	912	30,3604	54 001 1	TS&TQC	TS	L	
0456	REF	11	LAST	912	30,3605	22 141 0		LXCH	TEM1	
0457	REF	225	LAST	892	30,3606	0 0002 0		TC	G	

L FINDCROW - QUICAP INTERFACE

LSR'S PAGE NO. 15

E6 S3

PC458 ARCTGSP RETURNS THE 2'S COMPLEMENT, FI, SP ANGLE IN THE A REGISTER GIVEN ITS SINE IN A AND ITS COSINE IN I IN
 PC461 UNITS OF 2. THE RESULT IS AN UNWRAPPED ANGLE ANYWHERE IN THE CIRCLE, WITH A MAXIMUM ERROR OF +-4 BITS.
 R0462 THE ERROR IS PRODUCED BY THE SUBROUTINE SPARCSIN WHICH IS USED ONLY IN THE REGION +-45 DEGREES.

0464				20,367	0 0076 1	ARCTGSP	EXTEND		
0465	RFF	1		20,3610	1 2652 1	RZF	SINZERO	TC	AVOID DIVIDING BY ZERO
0466				20,3611	1 0116 1		EXTEND		
0467	RFF	1	LAST	20,3612	22 144 0	QXCH	TEM4		
0468	RFF	20	LAST	20,3613	54 142 1	TS	TEM2		
0469	RFF	158	LAST	20,3614	3 0001 0	CA	L		
0470	RFF	5	LAST	20,3615	54 142 0	TS	TEM3		
0471	RFF	174	LAST	20,3616	3 4755 1	CA	ZERO		
0472				20,3617	0 0006 1		EXTEND		
0473	RFF	21	LAST	20,3620	10 142 1	RV	TEM2		
0474				20,3621	0 0006 1		EXTEND		
0475	RFF	1		20,3622	1 2641 0	RZF	USFCOS		
0476	RFF	6	LAST	20,3623	11 143 0	CCS	TEM2		SIN IS SMALLER OR EQUAL
0477	RFF	175	LAST	20,3624	3 4755 1	CA	ZERO		
0478				20,3625	1 2631 1	TCF	+4		
0479	RFF	22	LAST	20,3626	4 0142 1	CS	TEM2		IF COS NEG, REVERSE SIGN OF SIN,
0480	RFF	23	LAST	20,3627	54 142 1	TS	TEM2		ANGLE = FI-ARCSIN(SIN)
0481	RFF	4	LAST	20,3630	2 4725 1	CA	NEGMAX		PICK UP FI, 2'S COMPLEMENT
0482	RFF	7	LAST	20,3631	54 143 0	TS	TEM3		WE NO LONGER NEED CCS
0483	RFF	24	LAST	20,3632	2 0142 0	CA	TEM2		
0484	RFF	2	LAST	20,3633	5 3657 0	TC	SPARCSIN -1		
0485	RFF	2	LAST	20,3634	0 3730 0	TC	DNSTC2S		
0486				20,3635	7 0116 1		EXTEND		
0487	RFF	8	LAST	20,3636	20 143 0	MSU	TEM3		
0488	RFF	5	LAST	20,3637	0 3730 0	ITC2&TCG	TC	DNSTC2S	
0489	RFF	11	LAST	20,3640	0 0144 0	TC	TEM4		
0490	RFF	9	LAST	20,3641	4 0143 0	USFCOS	CS	TEM3	COS IS SMALLER
0491	RFF	3	LAST	20,3642	2 3657 0	TC	SPARCSIN -1		ANGLE = SIGN(SIN)(PI/2-ARCSIN(COS))
0492	RFF	11	LAST	20,3643	6 4736 1	AD	HALF		
0493	RFF	10	LAST	20,3644	54 143 0	TS	TEM3		WE NO LONGER NEED COS
0494	RFF	25	LAST	20,3645	10 142 1	CCS	TEM2		
0495	RFF	11	LAST	20,3646	3 0143 1	CA	TEM3		
0496	RFF	1		20,3647	1 3627 1	TCF	ITC2&TCG		
0497	RFF	12	LAST	20,3650	4 0143 1	CS	TEM3		
0498	RFF	2	LAST	20,3651	1 3637 1	TCF	ITC2&TCG		
0499	RFF	159	LAST	20,3652	11 0111 1	SINZERO	CCS	L	
0500	RFF	176	LAST	20,3653	3 4755 1	CA	ZERO		
0501	RFF	226	LAST	20,3654	0 0002 0	TC	C		
0502	RFF	5	LAST	20,3655	2 4725 1	CA	NEGMAX		FI, 2'S COMPLEMENT
0503	RFF	227	LAST	20,3656	0 0112 0	TC	C		

L F1NDODLW - GLIAP INTERFACE

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R0514 SPARCSIN TAKES AN ARGUMENT SCALED UNITY IN A AND RETURNS AN ANGLE SCALED
 R0515 180 DEGREES IN A. IT HAS BEEN UNIT TESTED IN THE REGION $\pm .94$ (± 70
 R0516 DEGREES) AND THE MAXIMUM ERROR IS ± 5 BITS WITH AN AVERAGE TIME OF
 R0517 450 MICROSECONDS. SPARCSIN -1 TAKES THE ARGUMENT SCALED TWO (BCB CFISF)

0518				31,3657	6 0000 1	DCURLE		
0519	RFF	P	LAST	446	31,3660	54 021 1	SPARCSIN TS SR	
0510				31,3661	1 3665 0	TCF	+4	
0511	RFF	276	LAST	904	31,3662	50 000 1	INCRX	A
0512	RFF	1			31,3663	4 4724 1	CS	LIMITS
0513	RFF	5	LAST	916	31,3664	54 021 0	TS	SR
0514				31,3665	0 0006 1	EXTEND		
0515	RFF	277	LAST	916	31,3666	7 0000 1	MP	A
0516	RFF	12	LAST	914	31,3667	54 041 1	TS	TEM1
0517				31,3670	0 0006 1	EXTEND		
0518	RFF	1			31,3671	7 3713 0	MP	DPL9
0519	RFF	1			31,3672	6 3712 0	AD	DPL7
0520				31,3673	0 0006 1	EXTEND		
0521	RFF	13	LAST	916	31,3674	7 0141 1	MP	TEM1
0522	RFF	1			31,3675	6 3711 0	AD	DPL5
0523				31,3676	0 0006 1	EXTEND		
0524	RFF	14	LAST	916	31,3677	7 0141 1	MP	TEM1
0525	RFF	1			31,3700	6 3710 1	AD	DPL3
0526				31,3701	0 0006 1	EXTEND		
0527	RFF	15	LAST	916	31,3702	7 0141 1	MP	TEM1
0528	RFF	1			31,3703	6 3707 1	AD	DPL1
0529				31,3704	0 0006 1	EXTEND		
0530	RFF	10	LAST	916	31,3705	7 0021 0	MP	SR
0531	RFF	220	LAST	916	31,3706	0 0002 0	TC	Q
0532				31,3707	24405 0	DPL1	DEC	10502
0533				31,3710	00660 1	DPL3	DEC	432
0534				31,3711	16204 0	DPL5	DEC	7300
0535				31,3712	50744 0	DPL7	DEC	-11803
0536				31,3713	20315 1	DPL9	DEC	8397

L FIELDROW - OUTCAR INTO FAC

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R0537 LIMITSUB LIMITS THE MAGNITUDE OF THE POSITIVE OR NEGATIVE VARIABLE
 R0538 ARRIVING IN L TO THE POSITIVE LIMIT ARRIVING IN A.
 R0539 THE SIGNED LIMITED VARIABLE IS RETURNED IN A.

R0540 VERSION COURTESY RICH BLAIR-SMITH

0541	REF 16	LAST	916	30,3714	54 141 1	LIMITSUB TS	TFM1
0542	REF 177	LAST	915	30,3715	2 4755 1	CA	ZFRC
0543				30,3716	1 0006 1	EXTEND	
0544		17	LAST	917	30,3717	10 141 1	EV TFM1
0545	REF 278	LAST	916	30,3720	1 0000 0	CCS	A
0546	REF 18	LAST	917	30,3721	22 141 0	LXCH	TFM1
0547				30,3722	1 3724 1	TCF	+2
0548				30,3723	1 3726 0	TCF	+3
0549	REF 161	LAST	915	30,3724	3 0001 0	CA	L
0550	REF 229	LAST	916	30,3725	0 0002 0	TC	Q
0551	REF 10	LAST	917	30,3726	4 141 1	CS	TFM1
0552	REF 230	LAST	917	30,3727	0 0002 0	TC	Q

R0553 SUBROUTINE TO CONVERT 1'S COMP SP TO 2'S COMP

0554	REF 275	LAST	917	30,3730	11 0000 0	CMFSTO2S	CCS A
0555	REF 174	LAST	911	30,3731	6 4752 1	AC	ONE
0556	REF 231	LAST	917	30,3732	0 0002 0	TC	Q
0557	REF 28	LAST	917	30,3733	4 0000 0	CS	A
0558	REF 232	LAST	917	30,3734	0 0002 0	TC	Q

R0559 AG ATTITUDE CONTROL

0560	REF 25	LAST	870	30,3735	0 5567 0	AGATTICNT	TC ALARM
0561				30,3736	00402 1	EOT	GC402
0562				30,3737	0 0004 0	+2	INHINT
0563	REF 46	LAST	857	30,3740	0 4674 1	TC	IFKCALL
0564	REF 1	LAST	858	30,3741	42166 1	FOADR	STOPRATE
0565	REF 1			30,3742	1 3462 0	TCF	TCQCDUW

AG ATTITUDE CONTROL

CCME HERE FOR AGATTICNT WITHOUT ALARM
 RELINT AT TC INTPRET AFTER TCQCDUW

RETURN TO USER SKIPPING ALTCPILCT CMES

R0566 MIDPIT GIMBAL ANGLE ALARM

0567	REF 36	LAST	917	30,3743	1 5567 0	ALARMCAL	TC ALARM
0568				30,3744	00401 1	EOT	00401
0569	REF 1			30,3745	1 3262 0	TCF	MCARET

L FINDFLW - OUTCAP INTERFACE

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PC570 *****
 P0571 CONSTANTS
 PC572 *****

P0573 ADDRESS CONSTANTS

0574 PFF 3 LAST 903 31,2746 13246 1 ECDUWL ECDR ECDUW

P0575

P0576 THRUST DIRECTION FILTER CONSTANTS

0577 31,2747 06315 1 GAINELTR DEC .02 GAIN FILTER SANS CSM
 0578 31,2750 02146 1 DEC .01 GAIN FILTER WITH CSM
 0579 31,2751 00071 1 DUNEVLIM DEC .007 B-1 7 MR MAX CHG IN F DIR IN VFF IN 2 SECS.
 A0580 THIS DOES NOT ALLOW FOR S/C ROT RATE.
 0581 31,2752 02041 1 DUNEVLIM DEC .129 B-1 129 MR MAX THRUST OFFSET. 105 MR TRAVEL
 A0582 +10MR DFEL+5MR MECH MCLNT+5MR ABLATION.
 P0583

P0584 CONSTANTS RELATED TO GIBRAL ANGLE COMPUTATIONS

0585 31,2753 01673 1 DOTSXEMX DEC .93312 B-4 LIM COLNRTY OF UNWC/2 & UNFC/2 TO 85 DEG
 A0586 LOWER PART COMES FROM NEXT CONSTANT
 0587 31,2754 03434 1 DAXMAX DEC .1111111111 DELATTX LIM TO 20 DEG IN 2 SECS, 1'S, F1
 0588 31,2755 00260 0 DEC .0111111111 2 DEG WHEN CSM DOCKED
 0589 31,2756 01616 1 DAY/2MAX DEC .0555555555 LIKEWISE FOR DELATTY
 0590 31,2757 00133 0 DEC .0055555555
 0591 PFF 2 LAST 903 31,2754 DAZMAX = DAXMAX LIKEWISE FOR DELATTZ
 0592 31,2760 14344 1 CDUCLIM DEC .3888888888 70 DEG LIMIT FOR MGA, 1'S, F1
 R0593

P0594 CONSTANTS FOR DATA TRANSFER

0595 31,2761 01463 1 DT/DFLT DEC .05 .1 SEC/2 SEC WHICH IS THE AUTOPILOT
 A0596 CONTROL SAMPLE PERIOD/COMPLTATION PERIOD
 0597 PFF 2 LAST 903 31,2756 DELERLIM = DAY/2MAX 10 DEG LIMIT FOR LAG ANGLES, 1'S, F1
 R0598

*** END OF FLY .146 ***

L P51-P53

LSRP'S PAGE NO. 1 EO S3

R0011 PROGRAM NAME- PROCE2
 R0013 MFC AC-
 R0005 MODIFICATION BY- LENSKE

DATE- JAN 9, 1967
 LCG SECTION- P51-P53
 ASSEMBLY- SUNDANCE REV 46

R0007 FUNCTIONAL DESCRIPTION-

R0018 ALIGNS THE IMU TO ONE OF THREE ORIENTATIONS SELECTED BY THE ASTRONAUT. THE PRESENT IMU ORIENTATION IS KNOWN
 R0010 AND IS STORED IN PFSMAT. THE THREE POSSIBLE ORIENTATIONS MAY BE_

R0011 (A) FREEFALL ORIENTATION

R0012 AN OPTIMUM ORIENTATION FOR A PREVIOUSLY CALCULATED MANUEVER. THIS ORIENTATION MUST BE CALCULATED AND
 R0014 STORED BY A PREVIOUSLY SELECTED PROGRAM.

R0015 (B) NOMINAL ORIENTATION

P0016 $X = \text{UNIT} (X)$
 P0017 $-5M$

R0018 $Y = \text{UNIT} (Y \times K)$
 R0019 $5M$

R0020 $Z = \text{UNIT} (X \times X \times Y)$
 R0021 $5M \quad 5M \quad 5M$

R0022 WHERE_
 R0023 $R = \text{THE GEOMETRIC RADIUS VECTOR AT TIME T(ALIGN) SELECTED BY THE ASTRONAUT}$
 R0025 $-$

R0026 $V = \text{THE INITIAL VELOCITY VECTOR AT TIME T(ALIGN) SELECTED BY THE ASTRONAUT}$
 R0028 $-$

R0029 (C) FREEFALL ORIENTATION

R0030 (D) LANDING SITE - THIS IS NOT AVAILABLE IN SUNDANCE

R0031 THIS SELECTION CORRECTS THE PRESENT IMU ORIENTATION. THE PRESENT ORIENTATION DIFFERS FROM THAT TO WHICH IT
 R0043 WAS LAST ALIGNED ONLY DUE TO CYCLE DRIFT (I.E. NEITHER GIMBAL LOCK NOR IMU POWER INTERRUPTION HAS OCCURED
 R0035 SINCE THE LAST ALIGNMENT).

R0036 AFTER A IMU ORIENTATION HAS BEEN SELECTED ROUTINE S52.2 IS OPERATED TO COMPUTE THE GIMBAL ANGLES USING THE
 R0038 NEW ORIENTATION AND THE PRESENT VEHICLE ATTITUDE. CAL22A THEN USES THESE ANGLES, STORED IN TFCIAD,+1,+2, TO
 R0040 COARSE ALIGN THE IMU. THE STAR SELECTION ROUTINE, R56, IS THEN OPERATED. IF 2 STARS ARE NOT AVAILABLE AN ALARM
 R0042 IS FLASHED TO NOTIFY THE ASTRONAUT. AT THIS POINT THE ASTRONAUT WILL MANUEVER THE VEHICLE AND SELECT 2 STARS
 R0044 EITHER MANUALLY OR AUTOMATICALLY. AFTER 2 STARS HAVE BEEN SELECTED THE IMU IS FINE ALIGNED USING ROUTINE R51. IF
 R0046 THE RENDEZVOUS NAVIGATION PROCESS IS OPERATING (INDICATED BY RWCVZFLG) P20 IS DISPLAYED. OTHERWISE P00 IS
 R0048 REQUESTED.

R0049 CALLING SEQUENCE-

L P51-P52

USER'S PAGE NO. 2 EC 53

R0050 THE PROGRAM IS CALLED BY THE ASTRONAUT BY DSKY ENTRY.

R0051 SUBROUTINES CALLED-

R0052	1. FLAGDOWN	7. SF2.2	13. NEWMODEX
R0053	2. R12BCTH	8. CAL33A	14. PRIOLARM
R0054	3. GCFEPE4	9. FLACLP	
R0055	4. MATHEVF	10. P56	
R0056	5. CCFEASH	11. P51	
R0057	6. SF2.2	12. GCFEPE2	

R0058 NORMAL EXIT MODES-

R0059 EXITS TO ENDEJOP

R0060 ALARM OR ABORT EXIT MODES-

R0061 NONE

R0062 OUTPUT-

R0063 THE FOLLOWING MAY BE FLASHED ON THE DSKY

R0064	1. IML ORIENTATION CODE
R0065	2. ALARM CODE 215 - PREFERRED IML ORIENTATION NOT SPECIFIED
R0066	3. TIME OF NEXT IGNITION
R0067	4. GIMBAL ANGLES
R0068	5. ALARM CODE 405 - TWO STARS NOT AVAILABLE
R0069	6. PLEASE REFORM P00
R0070	THE MODE DISPLAY MAY BE CHANGED TO 20

R0071 REASABLE INITIALIZATION REQUIRED-

R0072 PERATELG SHOULD BE SET IF A PREFERRED ORIENTATION HAS BEEN COMPLETED. IF IT HAS BEEN COMPUTED IT IS STORED IN
 R0074 XSMO,YSMO,ZSMO.
 R0075 PNOVZLG INDICATES WHETHER THE NAVIGATION PROCESS IS OPERATING.

R0077 DEPRIS-

R0078 WORK AREA

0079				23,3762			BANK	32
0080	REF	2	LAST	250	15,2000		SETLCC	P505
0081					15,2050		BANK	

0082	REF	3	LAST	197	55,1755		FRANK=	BESTI
0083	REF	1					COUNT#	11/P52
0084	REF	248	LAST	888	15,2055	0 4616 1	TO	BANKCALL
0085	REF	10	LAST	831	15,2051	11236 0	CADP	R12BCTH
0086	REF	1			15,2052	3 4750 1	CAF	PERATEIT
0087	REF	27	LAST	856	15,2053	7 0076 1	MASK	FLACWRD2
0088	REF	281	LAST	917	15,2054	10 000 0	COS	A

IMU STATUS CHECK

IS PERATELG SET?

L P51-P52

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0099	REF	1		15,2055	0 2060 0	TC	P52A	YES
0090	REF	25	LAST	826	15,2056	3 6250 0	CAF	TRFEL
0091	REF	2	LAST	921	15,2057	0 2061 1	TC	P52A +1
0092	REF	41	LAST	846	15,2060	3 4753 1	CAF	R111
0093	REF	6	LAST	656	15,2061	55 1144 0	TS	OPTION2
0094	REF	42	LAST	921	15,2062	3 4753 1	CAF	B111
0095	REF	245	LAST	921	15,2063	0 4616 1	TC	BANKCALL
0096	REF	1			15,2064	20714 1	CADR	GCPRF48
0097	REF	34	LAST	847	15,2065	0 60 1 0	TC	GCPCPCH
0098					15,2066	1 2073 0	TCF	+5
0099	REF	1			15,2067	0 2062 1	TC	P52B
0100	REF	77	LAST	888	15,2070	0 5353 1	TC	FLASHENG
0101					15,2071	0 0114 1	CCT	0014
0102	REF	140	LAST	898	15,2072	0 5155 0	TC	ANDFLCB
0103	REF	7	LAST	921	15,2073	3 1144 1	CA	OPTION2
0104	REF	26	LAST	921	15,2074	7 6250 1	MASK	TRFEL
0105	REF	282	LAST	921	15,2075	50 000 1	INDEX	A
0106					15,2076	1 2077 0	TC	+1
0107	REF	1			15,2077	1 2155 0	TCF	OPT4
0108	REF	1			15,2100	1 2153 0	TCF	P52H
0109	REF	1			15,2101	1 2110 1	TCF	P52T
0110	REF	165	LAST	913	15,2102	0 6142 1	TC	INTPRT
0111					15,2103	77750 1	CCTC	
0112	REF	1			15,2104	02164 0	REF	P52F
0113					15,2105	0 0006 1	OPT4	EXTEND
0114	REF	5	LAST	779	15,2106	3 1411 0	CCA	TLAND
0115	REF	2	LAST	921	15,2107	1 2112 0	TCF	P52T +2
0116					15,2110	0 0006 1	P52T	EXTEND
0117	REF	22	LAST	895	15,2111	3 4755 1	CCA	NEG0
0118	REF	27	LAST	657	15,2112	53 1045 0	EXCH	DSPTFM1
0119	REF	1			15,2113	3 2170 1	CAF	V76N34*
0120	REF	25	LAST	921	15,2114	0 4616 1	TC	BANKCALL
0121	REF	26	LAST	847	15,2115	0 4777 1	CADR	GCFLASH
0122	REF	35	LAST	921	15,2116	0 60 1 0	TC	GCPCPCH
0123					15,2117	0 2121 1	TC	+2
0124					15,2120	0 2113 0	TC	+5
0125	REF	28	LAST	921	15,2121	53 1045 0	EXCH	DSPTFM1
0126					15,2122	0 0006 1	EXTEND	
0127					15,2123	0 2125 0	RZMF	+2
0128					15,2124	1 2127 0	TCF	+3
0129					15,2125	1 0006 1	EXTEND	
0130	REF	28	LAST	887	15,2126	3 0025 0	CCA	TIME2
0131	REF	4	LAST	213	15,2127	53 1775 1	EXCH	TALIGN
0132	REF	9	LAST	921	15,2130	3 1144 1	CA	OPTION2
0133	REF	42	LAST	900	15,2131	7 4752 1	MASK	R112
0134	REF	293	LAST	921	15,2132	10 000 0	CCS	A
0135	REF	1			15,2133	0 2137 0	TC	P52W

FLASH OPTION CODE AND ORIENTATION CODE
FLASH V04N06V22-PROCEED
NEW CODE - NEW ORIENTATION CODE INPLT
DISPLAY RETURNOPTION 4 LANDING SITE
OPTION 1 PREFERRED
OPTION 2 ACVINAL
OPTION 3 REFSMMAT

GC DO P51

IF OPTION 4 DISPLAY TLAND

IF TIME ZERO OR NEG USE TIME2

L PEJ-PEP

USFR'S PAGE NO. 4 EE S3

0136	REF 166	LAST 921	15,2134	6842 1	TC	INTERPRT
0137			15,2135	77650 1	GETC	
0138	REF 1		15,2136	32220 0		P52LS

OPTIC 4 - GET LS ORIENTATION

L P51-P52

USER'S PAGE NO. 5 P5 S3

P0139 START ALIGNMENT

0140	P5F	167	LAST	922	15,2137	J 6042 1	P52W	TC	INTPRFT	
0141					15,2140	45145 1		FLCAD	CALL	PICK UP ALIGN TIME
0142	P5F	5	LAST	921	15,2141	02775 0			TALIGN	COMPUTE NOMINAL IMU
0143	P5F	1			15,2142	31651 1			S52.3	ORIENTATION
0144					15,2143	77624 1	P52D	CALL		READ VEHICLE ATTITUDE AND
0145	P5F	1			15,2144	31620 1			S52.2	COMPLETE GIMBAL ANGLES
0146					15,2145	77776 1		EXIT		
0147	P5F	2	LAST	487	15,2146	2 5010 0		CAF	V6N22	
0148	P5F	251	LAST	921	15,2147	0 4016 1		TC	PANKCALL	DISPLAY GIMBAL ANGLES
0149	P5F	27	LAST	921	15,2150	2 2477 1		CADR	GCFASH	
0150	P5F	36	LAST	921	15,2151	J 6001 0		TC	GCTOPPOH	
0151	P5F	1			15,2152	1 2171 0		TCF	CCARSTYP	V33-PROCEED, SEE IF GYRO TORQUE COARSE
0152	P5F	168	LAST	923	15,2153	0 6042 1	P52H	TC	INTPRFT	
0153					15,2154	77650 1		EXIT		
0154	P5F	1			15,2155	22142 0			P52D	
0155	P5F	159	LAST	923	15,2156	J 6042 1	REGCOARS	TC	INTPRFT	DO COARSE ALIGN
0156					15,2157	77624 1		CALL		ROUTINE
0157	P5F	1			15,2160	21221 0			CA153A	
0158					15,2161	43114 0	COARSRET	SET	CLEAR	
0159	P5F	2	LAST	690	15,2162	01462 0			DEFSMFLC	
0160	P5F	2	LAST	762	15,2163	01273 0			PERPATFLG	
0161					15,2164	77624 1	P52F	CALL		
0162	P5F	1			15,2165	21007 1			P51	
0163					15,2166	77776 1	P52OLT	EXIT		
0164	P5F	27	LAST	923	15,2167	J 6001 0		TC	GCTOPPOH	
0165	P5F	5	LAST	740	15,2168	0 5016 1	V6N22	=	V6N22	
0166					15,2170	01442 1	V6N34*	VA	634	

L DESJ-DES

USER'S PAGE NO. 6 PS 53

P0167 CHECK FOR GRPE TORQUE COARSE ALIGNMENT

0168	REF	1		15,2171	3 2217 1	COARSTYP	CAF	OCT13
0169	REF	252	LAST	923	15,2172	0 4616 1	TC	BANKCALL
0170	REF	5	LAST	782	15,2173	20624 0	CADR	GCPEP1
0171	REF	28	LAST	923	15,2174	1 6111 1	TCF	GCOPCCH
0172	REF	1			15,2175	1 2156 5	TCF	PECCOARS
0173	REF	170	LAST	923	15,2176	0 6042 1	TC	JATPRT
0174					15,2177	64375 1	VLCAE	MXV
0175	REF	4	LAST	154	15,2201	36 7 0	XSMO	
0176	REF	27	LAST	873	15,2201	01734 0	REFSMAT	
0177					15,2202	77456 1	UNIT	
0178	REF	3	LAST	124	15,2203	26665 0	STCVL	XDC
0179	REF	2	LAST	148	15,2204	03615 0		YSMO
0180					15,2205	52521 1	MXV	UNIT
0181	REF	38	LAST	924	15,2206	01734 0		REFSMAT
0182	REF	3	LAST	124	15,2207	26673 1	STCVL	YEC
0183	REF	4	LAST	149	15,2210	07623 0		ZSMO
0184					15,2211	53521 1	MXV	UNIT
0185	REF	39	LAST	924	15,2212	01734 0		REFSMAT
0186	REF	3	LAST	124	15,2213	36701 1	STCALL	ZDC
0187	REF	1			15,2214	31156 1		GYCOARS
0188					15,2215	77650 1	CCTC	
0189	REF	1			15,2216	32166 1		P52OLT
0190					15,2217	00113 0	OCT13	CCT

DISPLAY V 51N25 WITH COARSE ALIGN OPTION

V34-TERMIN80E

V33-NORMAL COARSE

V32-CYFC TORQUE COARSE

GET SM(DESIRE) WRT SM(PRESENT)

L P51-P53

LSEPI'S PAGE NO. 7 E5 S3

P0101	COMPLETE LANDING ORIENTATION FOR OPTION 4									
0102					15,222	4214 0	P52LS	SET	CLAR	GET LANDING SITE ORIENTATION
0103	REF	4	LAST	784	15,2221	31463 1			LUMAFAC	
0104	REF	2	LAST	657	15,2222	50662 0			FFACFLAG	TC PICK UP RLS
0105					15,2223	77231 1		SETPD	VLAD	
0106					15,2224	100 1 0				
0107	REF	5	LAST	834	15,2225	02023 1			RLS	PICK UP LANDING SITE VEC IN MF
0108					15,2226	41525 0		PDDL	PLCH	RLS PD C-5
0109	REF	6	LAST	923	15,2227	02775 0			TALIGN	
0201	REF	6	LAST	921	15,2228	36401 1		STCALL	TLAND	JAM ALIGN TIME IN TLAND FOR OPTION 4
0202					15,2231	55716 1			PP-TC-R	TRANS RLS TO REF
0203					15,2232	77742 0		MSR2		
0203	REF	4	LAST	784	15,2233	16732 1		STCDL	ALPHAV	INPUT TO LAT-LONG
0204	REF	7	LAST	925	15,2234	02775 0			TALIGN	
0205					15,2235	77624 1		CALL		
0206	REF	1			15,2236	37440 1			NESDISP	
0207					15,2237	52575 0		VECAD	UNIT	COMPUTE LANDING SITE ORIENT (XSMD)
0209	REF	5	LAST	925	15,224	02022 1			ALPHAV	
0209	REF	5	LAST	924	15,2241	37617 1		STCALL	XSMD	
0210	REF	1			15,2242	10775 0			LSCRI AT	
0211					15,2243	77450 1		COTC		
0212	REF	2	LAST	923	15,2244	32143 0			P52C	NOW CC COMPLETE GIMBAL ANGLES

L P51-P53

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P0213 SUPPLUTINE TO CALCULATE AND DISPLAY THE LUNAR LANDING SITE

0214	REF	2	LAST	45	14,2440		SETLOC P5 S1	
0215					14,2440		CRANK	
0216	REF	16	LAST	395	14,1042		CRANK= XSP	
0217					14,2441	77620 0	NE5DISP	STQ
0218	REF	3	LAST	781	14,2441	02746 0		QMAJ
0219	REF	14	LAST	895	14,2442	35242 0	STCALL	GFT/2 +4
0220	REF	3	LAST	784	14,2443	26351 1		LAT-LONG
0221					14,2444	76545 1	FLCAD	SPI
0222	REF	3	LAST	315	14,2445	01122 1		LONG
0223	REF	3	LAST	318	14,2446	16711 1	STOCL	LANDLONG
0224	REF	3	LAST	315	14,2447	01124 1		ALT
0225	REF	2	LAST	318	14,2451	16713 0	STOCL	LANDALT
0226	REF	3	LAST	315	14,2451	01120 0		LAT
0227	REF	3	LAST	315	14,2452	02707 0	STORE	LANDLAT
0228					14,2453	77776 1	EXIT	
0229	REF	1			14,2454	3 2477 1	LSDISP	CAF V 6N89*
0230	REF	253	LAST	924	14,2455	0 4616 1	TC	PANCKALL
0231	REF	28	LAST	923	14,2456	2 1477 1	CACR	CCFLASH
0232	REF	30	LAST	924	14,2457	1 6001 1	TCF	GTCPCCH
0233					14,2460	1 2462 1	TCF	+2
0234	REF	1			14,2461	1 2454 1	TCF	LSDISP
0235	REF	171	LAST	924	14,2462	0 6142 1	TC	INTPRET
0236					14,2463	72545 0	DLCAD	SL1
0237	REF	4	LAST	924	14,2464	02711 1		LANDLONG
0238	REF	4	LAST	926	14,2465	15122 1	STOCL	LONG
0239	REF	3	LAST	926	14,2466	02713 0		LANDALT
0240	REF	4	LAST	926	14,2467	15124 1	STOCL	ALT
0241	REF	4	LAST	926	14,2470	02707 0		LANDLAT
0242	REF	4	LAST	926	14,2471	15121 0	STOCL	LAT
0243	REF	15	LAST	926	14,2472	01242 1		GFT/2 +4
0244					14,2473	77624 1	CALL	
0245	REF	1			14,2474	26422 1		LALCTCPV
0246					14,2475	77650 1	CCTC	
0247	REF	4	LAST	926	14,2476	02746 0		QMAJ
0248					14,2477	01531 1	V1 6N89* VN	689

TEMP STORE TIME

DISPLAY LAT, LONG/2, ALT

V34-TERMINATE-EXIT P57

V33-PROCEED- ACCEPT LS DATA

V32 OR E- LOOK AGAIN AND/CF LEAD NEW LS

PICK UP TIME

GFT FLS BACK FROM LAT, LONG, ALT

FLS B-29 IN MPAC AND ALPHA V

L P51-053

USER'S PAGE NO. 9 E5 S3

P0249 NAME = SEL ALIAS LCCSAM

R0250 PY

P0251 VINCENT

R0252 FUNCTION = COMPLETE INPUTS FOR PICAPAP AND PLANET

R0253 DEFINE

P0254 U = UNIT(SUN WRT EARTH)

R0255 -S

R0257 U = UNIT(MOON WRT EARTH)

R0258 -M

R0259 R = POSITION VECTOR OF LEM

R0260 L

R0261 R = MEAN DISTANCE (384412KM) BETWEEN EARTH AND MOON

R0262 -M

R0263 R = RATIO R / (DISTANCE SUN TO EARTH) >.00257125

R0264 -M

R0265 R = EQUATORIAL RADIUS (6378.166KM) OF EARTH

R0266 -

R0267 LCCSAM COMPUTES IN EARTH INFLUENCE

R0268

P0269 VSUN = U

R0270 -S

P0271 VFARTH = -UNIT(R)

R0272 L

P0273 VMCOON = UNIT(R * U - R)

R0274 -M -M L

P0275 CSUN = COS 90

P0276 CFAITH = (COS(90 + ARCSIN(R / MAG(R)))

P0277 -S L

P0278 CMCOON = COS 9

R0279

R0280 INPUT = TIME IN MPAC

R0281 OUTPUT = LISTED AREA

R0282 SUBROUTINES = LSPOS, LEMPOK

R0283 DEPENDS = VAC AREA, TSICHT

L P51-P53

LSE P'S PAGE NO. 10 E5 S3

[illegible]

L P51-P53

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0332	REF	2	LAST	928	14,257	14,23	0	STOCL	CMCDA	
0334	REF	2	LAST	928	14,256	30576	0		CSS5	
0335	REF	2	LAST	928	14,2561	00017	1	STORE	CEARTH	
0336					14,2562	77745	1	FACEAM	ELCAC	
0337	REF	1			14,2563	21600	1		CSSUN	
0338	REF	1			14,2564	10021	1	STORE	CCLN	
0339					14,2565	77650	1	ECTC		
0340	REF	3	LAST	928	14,2566	12745	0		QMIN	
0341					14,2567	70471	1	UCCOS	EDV	SPI
0342					14,2570	00045	0			360
0343					14,2571	43336	0	ASIN	DAD	
0344	REF	1			14,2572	37672	0		SEEGREES	
0345					14,2573	70546	1	CCS	SPI	
0346					14,2574	77616	0	RVQ		
0347					16			CEARTH	=	140
0348					002			CCLN	=	160
0349					0022			CMCDA	=	180
0350					14,2575	07761	1	CSS5	2DEC	.2490475 (CCS 5)/4
0350					14,2576	14473	1			
0351					14,2577	74010	0	CSSUN	2DEC	.125 (CCS6C)/4
0351					14,260	00000	1			
0352					14,261	00344	1	SEEGREES	2DEC	.013888889 SCALED IN PFVS
0352					14,262	21616	0			

L F51-P53

USER'S PAGE NO. 12 E5 S3

R0352 PROGRAM NAME - R56 DATE DEC 20 66
 R0354 MCE 1 LOG SECTION F51-P53
 R0355 ASSEMBLY SUNEISK REV40
 R0356 BY KEN VINCENT

FUNCTION

R0358 THIS PROGRAM READ THE INL-COOS AND COMPUTES THE VEHICLE ORIENTATION
 R0359 WITH RESPECT TO INERTIAL SPACE. IT THEN COMPUTES THE SHAFT AXIS (SAX)
 R0360 WITH RESPECT TO REFERENCE INERTIAL. EACH STAR IN THE CATALOG IS TESTED
 R0361 TO DETERMINE IF IT IS OCCULTED BY EITHER THE EARTH, SUN OR MOON. IF A
 R0362 STAR IS NOT OCCULTED THEN IT IS PAIRED WITH ALL STARS OF LOWER INDEX.
 R0363 THE PAIRED STARS ARE TESTED FOR OCCULTATION. PAIRS OF STARS THAT PASS
 R0364 THE OCCULTATION TESTS ARE TESTED FOR GOOD SEPARATION. A PAIR OF STARS
 R0365 HAVE GOOD SEPARATION IF THE ANGLE BETWEEN THEM IS LESS THAN 100 DEGREES
 R0366 AND MORE THAN 50 DEGREES. THOSE PAIRS WITH GOOD SEPARATION
 R0367 ARE THEN TESTED TO SEE IF THEY LIT IN CURRENT FIELD OF VIEW. (WITHIN
 R0368 5 DEGREES OF SAX). THE PAIR WITH MAX SEPARATION IS CHOSEN FROM
 R0369 THOSE WITH GOOD SEPARATION, AND IN FIELD OF VIEW.

CALLING SEQUENCE

R0370 L TO BANKCALL
 R0371 L+1 CALL R56
 R0372 L+2 ERROR RETURN - NO STARS IN FIELD OF VIEW
 R0373 L+3 NORMAL RETURN

OUTPUT

R0374 BESTI, BESTJ - SINGLE PR C, INTERCEPTS, STAR NUMBERS TIMES 4
 R0375 VFLAG - FLAG BIT SET IMPLIES NO STARS IN FIELD OF VIEW

INITIALIZATION

R0376 1)A CALL TO LOCSAX MUST BE MADE

DEBRIS

R0377 WORK AREA

R0378 X, Y, Z, P

R0379 SINGUL, COSCDD

R0380 STAPAC = STAP + 5

R0381	R56	1	14,2603	R56	=	PICARAP
R0382	R56	1			CCOUNT*	44/R56
R0383	R56	12	LAST 889	14,2613	4645 1	PICARAP
R0384	R56	4	LAST 929	14,2614	551745 1	IC
R0385	R56	172	LAST 926	14,2615	0 6042 1	TS
R0386	R56			14,2616	77624 1	IC
R0387	R56	4	LAST 550	14,2617	47541 1	CALL
R0388	R56			14,2618	77624 1	COLTRIG
R0389	R56	1		14,2611	20031 0	CALL
R0390	R56			14,2612	77611 0	CALCSMSC
R0391	R56			14,2613	70001 0	SETRO
R0392	R56			14,2614	71214 0	
R0393	R56	1		14,2615	01465 1	SET

VFLAG = 1

L F51-F53

LSR'S PAGE NO. 13

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0402	REF	1		14,2614	24007 0		DPZERO	
0404	REF	4	LAST	92	14,2617	26756 1	STOVL	BESTI
0405	REF	3	LAST	382	14,2620	72665 0		XN
0407					14,2621	63351 0	VXSC	PCVL
0407	REF	1			14,2622	24775 1		HALFDP
0408	REF	3	LAST	375	14,2623	72771 0		ZNE
0409					14,2624	74270 0	AXT,1	VXSC
0410					14,2625	00344 1		22ED
0411	REF	2	LAST	931	14,2626	24715 1		HALFDP
0412					14,2627	77655 1	VAD	
0413					14,2630	535 5 1	VXM	UNIT
0414	REF	40	LAST	924	14,2631	01734 0		REFSMAT
0414	REF	1			14,2632	02721 0	STORE	SAX
0416					14,2633	66331 0	SSP	SSP
0417	REF	7	LAST	612	14,2634	00051 0		S1
0418					14,2635	00076 1		6
0418	REF	10	LAST	528	14,2636	00 52 0		S2
0420					14,2637	00006 1		6
0421					14,2640	52100 1	PIC1	TIX,1
0422	REF	1			14,2641	30643 0		GCTO
0422	REF	1			14,2642	30760 0		PIC2
0422					14,2643	53373 0	PIC2	PICEND
0425	REF	1			14,2644	30347 1	VLOAD*	DOT
0426	REF	2	LAST	931	14,2645	02721 0		CATLOG,1
0427					14,2646	53325 0		SAX
0428	REF	1			14,2647	30757 1	DSU	RMA
0429	REF	1			14,2650	30640 0		CSS33
0430					14,2651	77754 1		PIC1
0431	REF	24	LAST	870	14,2652	00746 0	LXA,2	X1
0432					14,2653	52174 0	PIC3	TIX,2
0433	REF	1			14,2654	30656 1		GCTO
0434	REF	2	LAST	931	14,2655	30640 0		PIC4
0435					14,2656	50373 0	PIC4	PIC1
0436	REF	2	LAST	931	14,2657	47430 0	VLOAD*	DOT
0437	REF	3	LAST	931	14,2660	02731 0		CATLOG,2
0438					14,2661	50025 0		SAX
0439	REF	2	LAST	931	14,2662	30757 1	DSU	RMA
0440	REF	1			14,2663	30653 1		CSS33
0441					14,2664	47773 1		PIC3
0442	REF	3	LAST	931	14,2665	30247 1	VLOAD*	DOT*
0443	REF	4	LAST	931	14,2666	47430 0		CATLOG,1
0444					14,2667	51725 1		CATLOG,2
0445	REF	1			14,2670	30755 0	PSL	RFL
0446	REF	2	LAST	931	14,2671	30653 1		CSS40
0447					14,2672	45172 0		PIC3
0448	REF	5	LAST	931	14,2673	30347 1	VLOAD*	CALL
0449	REF	1			14,2674	30722 1		CATLOG,1
0450					14,2675	77614 1		CCULT
0451	REF	1			14,2676	01710 0	BON	
0452	REF	2	LAST	931	14,2677	30640 0		CULTFLAG
							PIC1	

X1 = 27 x 6 + 6

SAX = SHAFT AXIS
S1=S2=6

MAJCP STAR

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E5 S3

0453				14,2700	45173 7		VLCAD# CALL	
0454	PEF	6	LAST	931	14,2701	47430 0	CATLOC,2	
0455	PEF	2	LAST	931	14,2702	30722 1	OCCULT	
0456					14,2703	77614 1	ECN	
0457	PEF	2	LAST	931	14,2704	01710 0	CULTFLAG	
0458	PEF	3	LAST	931	14,2705	30553 1	PIC3	
0459					14,2706	77614 1	STRATEGY	BCNCLR
0460	PEF	2	LAST	930	14,2707	01616 0	VFLAG	
0461	PEF	1			14,2710	30725 1	NFWPAP	
0462					14,2711	65120 1	XCHX,1	XCHX,2
0463	PEF	5	LAST	931	14,2712	02755 1	PESTI	
0464	PEF	2	LAST	125	14,2713	02756 1	PESTJ	
0465					14,2714	47772 1	STRAT	VLCAD#
0466	PEF	7	LAST	932	14,2715	30347 1	DCT#	
0467	PEF	8	LAST	932	14,2716	47430 0	CATLOC,1	
0468					14,2717	43076 0	CATLOC,2	
0469	PEF	3	LAST	932	14,2720	01545 1	PUSH	BCFINV
0470	PEF	1			14,2721	30711 0	VFLAG	
0471					14,2722	45345 1	STRAT -3	
0472					14,2723	77644 1	DLQAD	DSU
0473	PEF	4	LAST	932	14,2724	30653 1	BFL	
0474					14,2725	67130 1	PIC3	
0475	PEF	6	LAST	932	14,2726	02755 1	NFWPAP	SXA,1
0476	PEF	3	LAST	932	14,2727	02756 1	SXA,2	
0477					14,2730	77650 1	PESTI	
0478	PEF	5	LAST	932	14,2731	30653 1	PESTJ	
0479					14,2732	51221 0	GOTI	
0480	PEF	1			14,2733	02757 0	OCCULT	MXV
0481	PEF	1			14,2734	02757 1	MXV	RVCU
0482					14,2735	77654 0	CULTFIX	
0483	PEF	1			14,2736	30751 1	CSS	
0484					14,2737	75240 0	EZE	
0485	PEF	2	LAST	932	14,2740	30751 1	BMN	CULTER
0486	PEF	371	LAST	913	14,2741	00160 0	BMN	SIGN
0487					14,2742	75240 0	BMN	CULTED
0488	PEF	2	LAST	932	14,2743	30751 1	BMN	MFAC +3
0489	PEF	372	LAST	932	14,2744	00162 1	BMN	SIGN
0490					14,2745	43040 1	BMN	CULTED
0491	PEF	4	LAST	932	14,2746	30751 1	BMN	MFAC +5
0492	PEF	3	LAST	932	14,2747	01632 0	BMN	CLRGD
0493	PEF	7	LAST	764	14,2750	00052 0	BMN	CULTER
0494					14,2751	77614 1	BMN	CULTFLAG
0495	PEF	4	LAST	932	14,2752	01430 1	CULTED	SETGC
0496	PEF	8	LAST	932	14,2753	00052 0	CULTED	QPRET
0497	PEF	2	LAST	925	0016		CSS	
0498					14,2754	05110 1	CSS40	2DFC
0499					14,2755	35052 0	CSS	=
0500					14,2756	05110 1	CSS32	2DEC
0501					14,2757	35052 0	CSS	0.16070
0502					14,2760	77414 0	PICEND	BCFF

CCS 50 /4

CCS 50 /4

L P51-P53

LSFF'S PAGE NO. 15 65 S3

0501	REF	4	LAST	932	14,2761	01745 0		VFLAG
0502	REF	1			14,2762	20764 1		PICGXT
0503	REF	1			14,2763	02000 1		TC
0504					14,2764	73151 1	PICGXT	PICBXT
0505	REF	7	LAST	932	14,2765	02755 1	LXA,1	LXA,2
0506	REF	4	LAST	932	14,2766	02756 1		BFSTJ
0507					14,2767	47775 1		BFSTJ
0508	REF	4	LAST	931	14,2770	02731 0	VLCAD	DCF*
0509	REF	9	LAST	932	14,2771	30347 1		SAX
0510					14,2772	47715 1		CATLOC,1
0511	REF	5	LAST	932	14,2773	02731 0	FDVL	DCF*
0512	REF	10	LAST	933	14,2774	47431 0		SAX
0513					14,2775	77625 0		CATLOC,2
0514					14,2776	66744 1	DSL	
0515	REF	1			14,2777	31003 0	PPL	SXA,1
0516	REF	5	LAST	932	14,2778	02756 1		PICNSWP
0517					14,2779	77734 1		BFSTJ
0518	REF	5	LAST	932	14,2780	02755 1	SXA,2	
0519					14,2781	77776 1		BFSTJ
0520	REF	5	LAST	930	14,2784	251745 0	PICNSWP	EXIT
0521	REF	6	LAST	933	14,2785	01745 0	INCR	GMIN
0522	REF	4	LAST	493	14,2786	14622 0	PICBXT	CA
0523							TC	SPCALL
0524							VFC	= 00
0525							VC	= 60
0526							V1	= 120
0527							V2	= 130
0528							V3	= 240
0529							DP1	= 300

L P51-P53

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PO530 NAME=P51 FINE ALIGN
 PO531 FUNCTION-TO ALIGN THE STABLE MEMBER TO REFSMMAT
 PO532 CALLING SEQ- CALL P51
 PO533 INPUT- REFSMMAT
 PO534 OUTPUT- GYRO TORQUE PULSES
 PO535 SUBROUTINES -LQCSAM, P51CALL, P52, P53, P54, P55

PO536 REF 1
 PO537
 PO538 REF 5 LAST 926 14,3007 77424 0 R51
 PO539
 PO540 REF 76 LAST 921 14,3011 77776 1 R51.1
 PO541 14,3012 5353 1
 14,3013 04024 0

COUNT# 55/R51
 STO
 GMAJ
 EXIT
 TC PHASCHNG
 CCT 04024

PO542 REF 2 LAST 194 14,3014 3 4761 0 R51C
 PO543 REF 254 LAST 926 14,3015 0 4616 1
 PO544 REF 6 LAST 924 14,3016 20624 0
 PO545 REF 4 LAST 926 14,3017 0 6001 0
 PO546 14,3020 0 3022 1
 PO547 REF 1 14,3021 0 3045 0
 PO548 REF 172 LAST 930 14,3022 0 6042 1
 PO549 14,3023 42224 0
 PO550 REF 25 LAST 845 14,3024 21574 1
 PO551 REF 1 14,3025 31155 1
 PO552 14,3026 77624 1

CAF OCTIE
 TC BANKCALL
 CADR GCPEPFI
 TC GCTDPOOH
 TC +2
 TC P51E
 TC INTERPT
 RIB CAF
 LCACTIME
 TSIGHT1
 CALL

V33E
 ENTER

PO553 REF 2 LAST 928 14,3027 30500 1
 PO554 14,3030 77776 1
 PO555 REF 255 LAST 934 14,3031 4616 1
 PO556 REF 1 14,3032 30603 1
 PO557 REF 1 14,3033 0 3025 1
 PO558 REF 2 LAST 934 14,3034 0 3045 0 P51F
 PO559 REF 37 LAST 917 14,3035 0 5567 0 R51I
 PO560 14,3036 00405 0
 PO561 REF 1 14,3037 3 5006 1
 PO562 REF 256 LAST 934 14,3040 0 4616 1
 PO563 REF 29 LAST 926 14,3041 20477 1
 PO564 REF 41 LAST 934 14,3042 0 6001 0
 PO565 REF 3 LAST 934 14,3043 0 3045 1
 PO566 REF 1 14,3044 0 3014 1
 PO567 REF 178 LAST 917 14,3045 3 4755 1 P51F
 PO568 REF 3 LAST 738 14,3046 55757 1
 PO569 REF 174 LAST 934 14,3047 0 6042 1 R51.2
 PO570 14,3050 77776 1 R51.3
 PO571 REF 78 LAST 934 14,3051 0 5353 1
 PO572 14,3052 04024 0

LQCSAM
 EXIT
 TC BANKCALL
 CADR R56
 TC R51I
 TC R51E
 TC ALARM
 CCT 4C5
 CAF VRO5NCO
 TC BANKCALL
 CADR GCFLASH
 TC GCTCPCCH
 TC R51E
 TC R51C
 CAF ZERO
 TS STARIND
 TC INTERPT
 EXIT
 TC PHASCHNG
 CCT 04024

PO573 REF 175 LAST 934 14,3053 0 6042 1
 PO574 14,3054 77624 1
 PO575 REF 1 14,3055 31671 0
 PO576 14,3056 77776 1
 PO577 REF 257 LAST 934 14,3057 0 4616 1

TC INTERPT
 CALL
 R52
 EXIT
 TC BANKCALL

ACF WILL MAKE CALLS TO SIGHTING

L P51-P52

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E5 S3

0579	REF	1		14,316	16001 0
0579	REF	258	LAST	934	14,316 1
0581	REF	1		14,316 2	177 4 1
0581	REF	1		14,316 3	57 1 1
0582	REF	4	LAST	934	14,316 4
0583	REF	1		14,316 5	1 3067 1
0584	REF	1		14,316 6	0 3137 1
0585	REF	176	LAST	934	14,316 7
0586	REF	1		14,316 8	0 6142 1
0587	REF	13	LAST	918	14,316 9
0588	REF	5	LAST	253	14,316 10
0589	REF	8	LAST	934	14,316 11
0591	REF	1		14,316 12	0 5353 1
0591	REF	1		14,316 13	0 6124 0
0592	REF	177	LAST	935	14,316 14
0593	REF	4	LAST	928	14,316 15
0594	REF	1		14,316 16	0 3562 0
0595	REF	1		14,316 17	32472 1
0596	REF	41	LAST	931	14,316 18
0597	REF	14	LAST	935	14,316 19
0598	REF	2	LAST	146	14,316 20
0599	REF	42	LAST	935	14,316 21
0600	REF	15	LAST	935	14,316 22
0601	REF	3	LAST	197	14,316 23
0602	REF	6	LAST	935	14,316 24
0603	REF	1		14,316 25	0 2757 0
0604	REF	1		14,316 26	34015 1
0605	REF	1		14,316 27	0 1250 1
0606	REF	1		14,316 28	45014 0
0607	REF	1		14,316 29	00354 0
0608	REF	1		14,316 30	0 1126 0
0609	REF	1		14,316 31	47443 1
0610	REF	1		14,316 32	77624 1
0611	REF	1		14,316 33	0 3126 0
0612	REF	1		14,316 34	77614 1
0613	REF	2	LAST	923	14,316 35
0614	REF	2	LAST	182	14,316 36
0615	REF	259	LAST	935	14,316 37
0616	REF	7	LAST	934	14,316 38
0617	REF	42	LAST	934	14,316 39
0618	REF	2	LAST	934	14,316 40
0619	REF	178	LAST	935	14,316 41
0620	REF	6	LAST	934	14,316 42
0621	REF	179	LAST	935	14,316 43
0622	REF	1		14,316 44	77775 1

CADR ACTMARK
 TC BANKCALL
 CADR CFTSTALL
 TC CLUSTAINS
 CCS STARIND
 TCF +2
 TC R51.4
 TC INTERPT
 VLCD
 STORC STAPSAV2
 EXIT
 TC PHASCHNG
 CCT 04124

TC INTERPT
 CLCD
 CALL
 TIGHT
 PLANET
 UNIT
 REFSMMAT
 STCVL STARAD +6
 P1/NVEC
 UNIT
 REFSMMAT
 STCVL STARAD
 STARSXV1
 STCVL 6F
 STARSXV2
 STCALL 12F
 P54
 BOFF
 CALL
 FREEFLAG
 R51K
 AXISGEN

STAR DATA TEST

GYRE TORQUE

R51K
R51P62

EXIT
 CAF
 TC
 CADR
 TC
 TC
 GCTC
 QMAJ
 TC
 VLCD

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0627	REF	16	LAST	93F	14,3141	12715 0		STARAC +6
0628	REF	4	LAST	93F	14,3142	12761 0	STORE	STARSAV1
0629					14,3143	45145 0	LOAD	CALL
063	REF	5	LAST	93F	14,3144	12562 0		TSIGHT
0631	REF	2	LAST	93F	14,3145	12472 1		PLANET
0632	REF	3	LAST	93F	14,3146	3554 0	STORE	PLANVEC
0633					14,3147	77721 1	SSP	
0634	REF	5	LAST	93F	14,3150	12761 1		STARIND
0635					14,3151	12761 1		L
0636					14,3152	7765 1	CODE	
0637	REF	1			14,3153	31150 0		R51.3
0638					14,3154	00002 0	TSIGHT1	2DEC
0639					14,3155	0624 1		36000

6 MIN TO MARKING

L P51-P53

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P0672 P55 CYRC TCRQUE
R0673 FUNCTION-COMPLIE AND SEND CYRC PULSES
P0674 CALLING SEQ- CALL R55
R0675 INPUT- X,Y,ZFC- REFSMAT WPT PRESENT STABLE MEMEBF
R0676 OUTPUT- CYRC PULSES
P0677 SUBROUTINES- CALCCTA, GDFLASH, GDSPP, IMPLINE, IMPLPULSE, GCPEPF1
P0678 RFF 1 COUNT# $1/P55
P0679 RFF 7 LAST 933 14,3216 77620 0 R55 STC
P0680 RFF 2 LAST 937 14,3221 47251 1 CALL QMIN
P0681 RFF 1 LAST 937 14,3222 77775 1 PULSEM Ex1T
P0682 RFF 263 LAST 937 14,3223 3 2246 1 R55.1 CAF V06N93
P0683 RFF 30 LAST 934 14,3224 0 4616 1 TC BANKCALL
P0684 RFF 42 LAST 935 14,3225 20477 1 CACR GDFLASH
P0685 RFF 1 LAST 937 14,3226 0 601 0 TC GETEPCCH
P0686 RFF 1 LAST 937 14,3227 0 3231 1 TC P55.2
P0687 RFF 1 LAST 937 14,3228 0 3243 1 TC R55RET
P0688 RFF 32 LAST 937 14,3231 0 5252 1 RFF.2 TC PHASCHAG
P0689 RFF 2 LAST 937 14,3232 0 214 0 OCT 00214
P0690 RFF 2 LAST 937 14,3233 2 2247 0 CA R55CFP
P0691 RFF 264 LAST 937 14,3234 0 4616 1 TC BANKCALL
P0692 RFF 5 LAST 937 14,3235 17315 0 CACR IMUPULSE
P0693 RFF 265 LAST 938 14,3236 0 4616 1 TC BANKCALL
P0694 RFF 9 LAST 937 14,3237 17710 1 CACR IMUSTALL
P0695 RFF 2 LAST 937 14,3240 0 5701 1 TC CLPTAINS
P0696 RFF 82 LAST 938 14,3241 0 5352 1 TC PHASCHAG
P0697 RFF 2 LAST 937 14,3242 0 4124 0 OCT 04124
P0700 RFF 151 LAST 937 14,3243 0 6242 1 R55RET TC INTPTFT
P0701 RFF 8 LAST 938 14,3244 77650 1 GOTO QMIN
P0702 RFF 11 LAST 389 14,3245 02745 0 VN 0693
P0703 RFF 1 LAST 389 14,3246 01535 0 VC6N93 ECADR CCC
P0704 RFF 1 LAST 389 14,3247 02737 0 R55CFR = CHKSEATA
P0705 RFF 1 LAST 389 14,3250 02737 0 R54 =
R0706 ROUTINE NAME- CHKSEATA
R0708 MOD NO- 0
R0710 MODIFICATION BY- LCMASK

```

DATE- JAN 9, 1967
 LOG SECTION- P51-P53
 ASSEMBLY-

R0712 FUNCTIONAL DESCRIPTION - CHECKS THE VALIDITY OF A PAIR OF STAR SIGHTINGS. WHEN A PAIR OF STAR SIGHTINGS ARE MADE
 R0714 BY THE ASTRONAUT THIS ROUTINE OPERATES AND CHECKS THE OBSERVED SIGHTINGS AGAINST STORED STAR VECTORS IN THE
 R0716 COMPUTER TO INSURE A PROPER SIGHTING WAS MADE. THE FOLLOWING COMPUTATIONS ARE PERFORMED-

```

R0718 CS1 = OBSERVED STAR 1 VECTOR
R0719 CS2 = OBSERVED STAR 2 VECTOR
R0720 SS1 = STORED STAR 1 VECTOR
R0721 SS2 = STORED STAR 2 VECTOR
R0722 A1 = AFCCOS(CS1 - CS2)
R0723 A2 = AFCCOS(SS1 - SS2)
R0724 A = ACS(2(A1 - A2))

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L 951-052

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R0725 THE ANGULAR DIFFERENCE IS DISPLAYED FOR ASTRONAUT ACCEPTANCE
R0726 EXIT MODE 1. FREEFLAG SET IMPLIES ASTRONAUT WANTS TO FREEDOM
R0727 2. FREEFLAG RESET IMPLIES ASTRONAUT WANTS TO RECYCLE (FRANCE)
R0729 CUTEFL - 1. VERB 6, NOUN 3 - DISPLAYS ANGULAR DIFFERENCE BETWEEN 2 SETS OF STARS.
R0731 2. STAR VECTOR SYSTEM STAR CATALOG ARE LEFT IN 60 AND 120.

P0732 FRASAELE INITIALIZATION REQUIRED -
R0733 1. MARK VECTORS ARE STORED IN STARAD AND STARAD +6.
R0734 2. CATALOG VECTORS ARE STORED IN 60 AND 120.

L P51-P53

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0776          14,3316  77650 1          CCTC
0777  REF 11 LAST 939  14,3317  02745 1          GMIN
0778          14,3320  01415 1  VR6N5  VN  605
R0779  NAME - CAL53A
R0780  FUNCTION - COMPUTE DESIRED GIMBAL ANGLES AND COARSE ALIGN IF NECESSARY
R0781  CALLING SEQUENCE - CALL CAL53A
R0782  INFLT - X,Y,ZSMF ,COLX,Y,Z
R0783          DESIRED GIMBAL ANGLES - THETAD,+1,+2
R0784  OUTFLT - THE IMU COORDINATES ARE STORED IN REFSMAT
R0785  SUBROUTINES - S52.2, IMUCOARSE, IMUFINE
0786  REF 1          COUNT* $4/P50
0787          14,3321  77624 1  CAL53A  CALL
0788  REF 2 LAST 922  14,3322  31620 1          S52.2          MAKE ONE FINAL COMP OF GIMBAL ANGLES
0789          14,3323  66234 1          RTP          SSF
0790  REF 1          14,3324  21405 1          REDCUS          READ CCUS
0791  REF 8 LAST 931  14,3325  01751 0          S1
0792          14,3326  00001 0          1
0793          14,3327  40270 1          AXT,1  SETPC
0794          14,3330  00003 1          3
0795          14,3331  00005 1          4
0796          14,3332  70543 1  CALOOP  DIODAD* SR1
0797  REF 10 LAST 979  14,3333  00325 0          THETAD +3D,1
0798          14,3334  70523 1          FDDI*  SR1
0799          14,3335  00005 1          4,1
0800          14,3336  51425 0          CSU  AES
0801          14,3337  45206 1          FLSH  DSL
0802  REF 1          14,3340  31474 0          DEGREE1
0803          14,3341  71240 1          PMN  CLCAC
0804  REF 1          14,3342  21360 0          CALDCPI
0805          14,3343  51025 1          CSU  RPI
0806  REF 1          14,3344  21405 1          DEG359
0807  REF 2 LAST 940  14,3345  31360 0          CALDCPI
0808          14,3346  77776 1          EXIT
0809  REF 84 LAST 928  14,3347  05353 1          TC  PHASCHNG
0810          14,3350  04024 0          OCT  04024
0811  REF 184 LAST 936  14,3351  06042 1          TC  INTERP
0812          14,3352  77624 1  COARFINE  CALL
0813  REF 1          14,3353  31557 1          COARSE
0814          14,3354  77624 1          CALL
0815  REF 2 LAST 937  14,3355  31603 0          NCORSE
0816          14,3356  77650 1          CCTC
0817  REF 1          14,3357  31362 1          FINEONLY
0818          14,3360  77700 0  CALDCPI  TIX,1
0819  REF 1          14,3361  31372 1          CALDCP
0820          14,3362  75160 1  FINEONLY  AXC,2
0821  REF 17 LAST 926  14,3363  02642 0          XSM
0822  REF 44 LAST 927  14,3364  01732 1          REFSMAT
0823          14,3365  77624 1          CALL
0824  REF 2 LAST 937  14,3366  31371 0          MATMCVE

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L DEJ-P53

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0825				14,2367	7765	1	GCTC		
0826	R-F	1		14,2370	32161	1		CCALSRET	
0827				14,2371	77773	1	MATHCVR	VLCAD*	TRANSFER MATRIX
0828				14,2372	00010	0		0,1	
0829				14,2373	10011	1		STORE	0,2
0830				14,2374	77773	1		VLCAD*	
0831				14,2375	00017	0		60,1	
0832				14,2376	10017	1		STORE	60,2
0833				14,2377	77773	1		VLCAD*	
0834				14,2400	00015	0		120,1	
0835				14,2401	10015	1		STORE	120,2
0836				14,2402	77616	0		RVQ	
0837				14,2403	00056	1	DEGREEF1	DFC	46
0838				14,2404	77722	1	DEGREE5	DFC	16338
0839				14,2405	00074	0	RECCUS	INFINT	
0840	R-F	14	LAST	904	14,2406	20032	0	CA	CDUX
0841	R-F	31	LAST	914	14,2407	50120	1	INDEX	FIXLOC
0842					14,2410	54011	1	TS	1
0843	R-F	7	LAST	904	14,2411	30033	1	CA	CDLY
0844	R-F	32	LAST	941	14,2412	50120	1	INDEX	FIXLOC
0845					14,2413	54012	1	TS	2
0846	R-F	11	LAST	904	14,2414	30034	0	CA	CDLZ
0847	R-F	33	LAST	941	14,2415	50120	1	INDEX	FIXLOC
0848					14,2416	54013	0	TS	3
0849					14,2417	00013	1	PFLINT	
0850	R-F	1			14,2420	00676	0	TC	DANZIG
0851	R-F	1						COUNT*	\$/INFLT

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L F51-P53

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P0852 NAME - P51 - IMU ORIENTATION DETERMINATION
 R0853 MOD. AC.1 23 JAN 67
 P0855 MOD BY STIRLINGSON

LOG SECTION - F51-P53
 ASSEMBLY SUNDANCE REV56

P0857 FUNCTIONAL DESCRIPTION

R0858 DETERMINES THE INERTIAL ORIENTATION OF THE IMU. THE PROGRAM IS SELECTED BY ESKY ENTRY. THE SIGHTING
 R0861 (ACTMARK) ROUTINE IS CALLED TO COLLECT AND PROCESS MARKED-STAR DATA. ACTMARK(R53) RETURNS THE STAR NUMBER AND THE
 R0862 STAR LOS VECTOR IN STARA(46). TWO STARS ARE THUS SIGHTED. THE ANGLE BETWEEN THE TWO STARS IS THEN CHECKED AT
 R0864 CHKSDATA(R54). REFSMMAT IS THEN COMPLETED AT AXISGEN.

P0865 CALLING SEQUENCE

P0866 THE PROGRAM IS CALLED BY THE ASTRONAUT BY ESKY ENTRY.

P0867 SUBROUTINES CALLED.

R0868 GCPREF2
 R0869 GCPREF1
 R0870 EDCSPF
 R0871 IMUCARS
 R0872 IMULIN2C
 R0873 ACTMARK(P53)
 R0874 CHKSDATA(P54)
 R0875 MKREFLEAS
 R0876 AXISGEN
 R0877 MATMCMF

R0878 ALARMC

R0879 NAME.

R0880 FRASABLE INITIALIZATION

R0881 IMU ZERO FLAG SHOULD BE SET.

R0882 CULPL1

R0883 REFSMMAT
 R0884 REFSMFLC

R0885 DEPRIS

R0886 WORK AREA
 R0887 STARAD
 R0888 STARDINP
 R0889 RESTI
 R0890 RESTJ

0891 REF 1

COUNT 44/P51

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0892	REF	267	LAST	929	14,3421	0 4616	1	P51	TC	BANKCALL	IS ISS ON - IF ACT, IMUCHK WILL SEND ALARM CODE 210 AND EXIT VIA GCTCPCCH.
0893	REF	1			14,3422	33635	1		CADR	IMUCHK	
0894	REF	2	LAST	934	14,3423	2 4761	0		CAF	GCT15	
0895	REF	268	LAST	943	14,3424	0 4616	1		TC	BANKCALL	
0896	REF	9	LAST	935	14,3425	21624	0		CADR	GCTFER1	
0897	REF	45	LAST	935	14,3426	0 6011	0		TC	GCTCPCCH	TERM.
0898	REF	1			14,3427	1 3453	1		TCF	P51R	V32
0899	REF	85	LAST	940	14,3430	0 5353	1		TC	PHASCHNG	
0900					14,3431	4124	0		CCT	0424	
0901	REF	175	LAST	934	14,3432	3 4755	1		CAF	ZFFC	
0902	REF	11	LAST	941	14,3433	54 321	0		TS	THETAD	ZFFC THE GIMBALS
0903	REF	12	LAST	943	14,3434	54 322	0		TS	THETAD +1	
0904	REF	13	LAST	942	14,3435	54 323	1		TS	THETAD +2	
0905	REF	3	LAST	922	14,3436	2 5110	0		CAF	VP6N22	
0906	REF	269	LAST	943	14,3437	0 4616	1		TC	BANKCALL	
0907	REF	2	LAST	750	14,3440	20447	1		CADR	GCTSPRET	
0908	REF	1			14,3441	3 3556	1		CAF	V4IK	NOW DISPLAY COARSE ALIGN VERR 41
0909	REF	270	LAST	943	14,3442	0 4616	1		TC	BANKCALL	
0910	REF	4	LAST	943	14,3443	20447	1		CADR	GCTSPRET	
0911	REF	185	LAST	940	14,3444	0 6142	1		TC	INTPRET	
0912					14,3445	77624	1		CALL		
0913	REF	2	LAST	940	14,3446	31557	1			CCARSE	
0914					14,3447	77776	1		EXIT		
0915	REF	86	LAST	942	14,3450	0 5353	1		TC	PHASCHNG	
0916					14,3451	04024	0		CCT	04024	
0917	REF	2	LAST	234	14,3452	1 3423	0		TCF	P51 +2	
0918	REF	87	LAST	943	14,3453	0 5353	1	P51R	TC	PHASCHNG	
0919					14,3454	00014	1		CCT	00014	
0920	REF	186	LAST	942	14,3455	0 6142	1		TC	INTPRET	
0921					14,3456	77624	1		CALL		
0922	REF	3	LAST	940	14,3457	31603	0			NCCARSE	
0923					14,3458	41231	1		SSP	SETPC	
0924	REF	6	LAST	936	14,3461	02760	1			STARIND	INDEX-STAR 1 CR 2
0925					14,3462	00011	1			0	
0926					14,3463	00011	0			0	
0927					14,3464	77776	1	P51C	EXIT		
0928	REF	88	LAST	942	14,3465	0 5353	1		TC	PHASCHNG	
0929					14,3466	4124	0		CCT	4124	
0930	REF	271	LAST	943	14,3467	0 4616	1		TC	BANKCALL	
0931	REF	2	LAST	925	14,3470	16700	0		CADR	ACTMARK	R53
0932	REF	272	LAST	943	14,3471	0 4616	1		TC	BANKCALL	
0933	REF	1			14,3472	17704	1		CADR	ACTSTALL	
0934	REF	4	LAST	938	14,3473	0 5701	1		TC	CLRTAINS	
0935	REF	7	LAST	942	14,3474	11757	1		CCS	STARIND	
0936	REF	1			14,3475	1 2513	0		TCF	P51C +1	
0937	REF	187	LAST	943	14,3476	0 6142	1		TC	INTPRET	

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0938				14,3477	77775 1	VLCAD	
0939	REF	18	LAST	936	14,3511	2715 0	STARAD +6
0940	REF	5	LAST	936	14,3511	02761 0	STORE STARSATV1
0941				14,3512	77776 1	P510	EXIT
0942	REF	89	LAST	943	14,3513	15353 1	TC PHASCHNG
0943				14,3514	1424 0		CCT 04024
0944	REF	2	LAST	943	14,3515	11757 1	CCS STARINP
0945	REF	1			14,3516	13522 0	TCF P51F
0946	REF	50	LAST	944	14,3517	15353 1	TC PHASCHNG
0947				14,3518	1424 0		CCT 04024
0948	REF	188	LAST	943	14,3511	06742 1	TC INTERPT
0949				14,3512	45145 0		PLCAD CALL
0950	REF	6	LAST	936	14,3513	03562 0	TSIGHT
0951	REF	2	LAST	936	14,3514	32472 1	PLANET
0952	REF	4	LAST	936	14,3515	03554 0	STORE PLANVFC
0953				14,3516	77776 1		EXIT
0954	REF	43	LAST	921	14,3517	34753 1	CAF BIT1
0955	REF	0	LAST	944	14,3518	55157 1	TS STARIND
0956	REF	1			14,3521	13465 1	TCF P51C +1
0957	REF	91	LAST	944	14,3522	15353 1	TC PHASCHNG
0958				14,3523	04024 0	P51	CCT 04024
0959	REF	189	LAST	944	14,3524	06742 1	TC INTERPT
0960				14,3525	45145 0		PLCAD CALL
0961	REF	7	LAST	944	14,3526	03562 0	TSIGHT
0962	REF	4	LAST	944	14,3527	32472 1	PLANET
0963				14,3528	2415 0		STCVL 120
0964	REF	5	LAST	944	14,3531	03554 0	PLANVEC
0965				14,3532	24007 0		STCVL 60
0966	REF	6	LAST	944	14,3533	02761 0	STARSATV1
0967	REF	19	LAST	944	14,3534	26707 0	STARAD
0968	REF	7	LAST	936	14,3535	02767 0	STARSATV2
0969	REF	20	LAST	944	14,3536	36715 1	STCALL STARAD +6
0970	REF	2	LAST	936	14,3537	21353 1	CHKSCPT0
0971				14,3540	77414 0		CHKSCPT0
0972	REF	7	LAST	936	14,3541	00314 1	EXIT
0973	REF	1			14,3542	21544 0	FREEFLAG
0974	REF	3	LAST	943	14,3543	03423 1	P51G
0975				14,3544	77624 1	P51	CALL P51 +2
0976	REF	2	LAST	936	14,3545	47442 1	AXISGEN
0977				14,3546	75160 1		AXC,1
0978	REF	4	LAST	924	14,3547	32664 1	AXC,2
0979	REF	45	LAST	940	14,3550	01732 1	XCC
0980				14,3551	77624 1		REFSMAT
0981	REF	3	LAST	940	14,3552	31271 0	CALL
0982				14,3553	77414 0		MATMCOVF
0983	REF	5	LAST	927	14,3554	01462 0	SET
0984	REF	46	LAST	943	14,3555	06001 1	REFSMFLC
							TC GCTOPCH

DO SECOND STAR

CHECK STAR ANGLES IN STARAD AND

COME BACK WITH REFSMAT IN XCC

FINIS

L P51-P53

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0985				14,3556	12200	1	V41K	VM	4100	
0986				14,3557	77776	1	CCARSE	EXIT		
0987	REF	5	LAST	275	14,3558	3 1301	1	+1	CA	MODECADR
0988					14,3561	0 0006	1		EXTEND	SEE IF IMU DEVICE IS IN USE.
0989	REF	1			14,3562	1 3567	1		EXTEND	
0990	REF	18	LAST	894	14,3563	3 4777	1		EXTEND	
0991	REF	272	LAST	942	14,3564	0 4616	1		EXTEND	
0992	REF	14	LAST	750	14,3565	0 1736	1		EXTEND	
0993	REF	3	LAST	942	14,3566	1 3567	0		EXTEND	
0994	REF	274	LAST	945	14,3567	1 4616	1	DOCCRS	EXTEND	
0995	REF	4	LAST	375	14,3570	16772	1		EXTEND	
0996	REF	275	LAST	945	14,3571	0 4616	1		EXTEND	
0997	REF	13	LAST	938	14,3572	17710	1		EXTEND	
0998	REF	5	LAST	942	14,3573	0 5711	1		EXTEND	
0999	REF	276	LAST	945	14,3574	0 4616	1		EXTEND	
1000	REF	3	LAST	375	14,3575	17212	1		EXTEND	
1001	REF	277	LAST	945	14,3576	0 4616	1		EXTEND	
1002	REF	11	LAST	945	14,3577	17711	1		EXTEND	
1003	REF	6	LAST	945	14,3578	0 5711	1		EXTEND	
1004	REF	100	LAST	944	14,3579	0 6042	1		EXTEND	
1005					14,3580	77616	0		EXTEND	
1006					14,3583	77776	1	CCARSE	EXTEND	
1007	REF	15	LAST	894	14,3584	2 0025	0		EXTEND	
1008	REF	0	LAST	858	14,3585	551174	1		EXTEND	
1009	REF	100	LAST	942	14,3586	4 4755	0		EXTEND	
1010	REF	14	LAST	894	14,3587	54 037	1		EXTEND	
1011	REF	5	LAST	894	14,3588	54 141	1		EXTEND	
1012	REF	8	LAST	895	14,3589	54 141	0		EXTEND	
1013	REF	121	LAST	945	14,3590	0 6042	1		EXTEND	
1014					14,3591	77775	1		EXTEND	
1015	REF	3	LAST	687	14,3594	24017	0		EXTEND	
1016	REF	24	LAST	384	14,3595	0 1472	1		EXTEND	
1017					14,3596	43314	1		EXTEND	
1018	REF	2	LAST	937	14,3597	0 1060	0		EXTEND	

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P1010 NAME-S52.2
 P1020 FUNCTION-COMPUTE TIMEAL ANGLES FOR DESIRED SM AND PRESENT VEHICLE
 P1021 CALL- CALL S52.2
 P1022 INPUT- X,Y,ZSMC
 P1023 OUTPUT- FCC,ICC,MGC,THETA0,+1,+2
 P1024 SUBROUTINE S-CALCFC, CALCSMSC, MATMCVC, CALCEA
 1025 REF 1
 1026 14,3621 45321 1 S52.2 COUNT# S5/S52.1
 1027 REF 8 LAST 937 14,3621 02746 0 STR CALL
 1028 REF 5 LAST 931 14,3622 47541 1 QMAJ
 1029 14,3623 77624 1 CALL CDITRIG
 1030 REF 2 LAST 930 14,3624 27021 0 CALL CALCSMSC
 1031 14,3625 66370 0 AXT,1 SSP
 1032 14,3626 00022 1 180
 1033 REF 9 LAST 940 14,3627 00251 0 S1
 1034 14,3630 00016 1 60
 1035 14,3631 61373 1 S52.2A VLOAD* VXM
 1036 REF 4 LAST 931 14,3632 02717 0 XNB +180,1
 1037 REF 46 LAST 944 14,3633 01734 0 REFSMMAT
 1038 14,3634 77656 1 UNIT
 1039 REF 5 LAST 946 14,3635 05707 1 STORE XNB +180,1
 1040 14,3636 77710 0 TIX,1
 1041 REF 1 14,3637 31621 1 S52.2A
 1042 14,3640 75160 1 S52.2.1 AXC,1
 1043 REF 7 LAST 937 14,3641 03616 1 XSMC
 1044 REF 18 LAST 940 14,3642 02642 0 XSM
 1045 14,3643 77624 1 CALL
 1046 REF 4 LAST 944 14,3644 31371 0 MATMCVC
 1047 14,3645 77624 1 CALL
 1048 REF 2 LAST 975 14,3646 47355 1 CALCEA
 1049 14,3647 77650 1 GETC
 1050 REF 9 LAST 946 14,3650 02746 0 QMAJ

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P1051 NAME=S52.3
R1052 FUNCTION XSMF= UNIT
P1053 YSMF= UNIT(V X P)
R1054 ZSMF= UNIT(XSMF X YSMF)
R1055 CALL DLOAD CALL
R1056 TALIGN
R1057 S52.3
R1058 INPUT- TIME OF ALIGNMENT IN MPAC
R1059 OUTPUT- X,Y,ZSMF
R1060 SLEWPLINE S- COSMCONIC
1061 REF 1
1062 14,3651 7762 0 S52.3
1063 REF 10 LAST 946 14,3652 02746 0
1064 REF 48 LAST 928 14,3653 34041 0
1065 REF 5 LAST 592 14,3654 27101 1
1066 14,3655 52575 0
1067 REF 31 LAST 928 14,3656 00001 0
1068 REF 6 LAST 946 14,3657 27517 0
1069 REF 22 LAST 832 14,366 00007 0
1070 14,3661 53435 0
1071 REF 21 LAST 947 14,3662 00001 0
1072 REF 4 LAST 924 14,3663 27615 0
1073 REF 9 LAST 947 14,3664 03617 0
1074 14,3665 53435 0
1075 REF 5 LAST 947 14,3666 03615 0
1076 REF 4 LAST 924 14,3667 37623 1
1077 REF 11 LAST 947 14,367 02746 0

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COLL1* S5/S52.3
STQ

GM4J
STCALL TDEC1
LEMCONIC

VFAC UNIT
RATT

STCVL XSMF
VATT

VXV UNIT
RATT

STCVL YSMF
XSMF

VXV UNIT
YSMF

STCALL ZSMF
GM4J

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P1078 NAME -R52 (AUTOMATIC OPTICS POSITIONING ROUTINE)

R1079 FUNCTION-POINT THE ACT OPTIC AXIS BY MANEUVERING THE LEM TO A NAVIGATION
R1080 STAR SELECTED BY ALIGNMENT PROGRAMS OR DSKY INPUT

R1081 CALLING -CALL R52

R1082 INPLT -R52I AND R52J (STAR CODES TIMES 6)

R1083 OUTPUT -STAR CODE IN BITS 1-6, DEFINT CODE IN BITS 7-9

R1084 (NO CHECK IS MADE TO INSURE THE DEFINT CODE IS BE VALID)

R1085 POINTVSM=1/2 UNIT NAV STAR VEC IN SM

R1086 SCAXIS=ACT OPTIC AXIS VEC IN NB X-Z PLANE

R1087 SLFPCUT -R6 LEM

1088	REF	1				14,3671	77420	1	P52	COLAT#	\$1/P52	
1089						14,3672	03665	1		STQ	FX17	
1090	REF	1				14,3673	51757	0			SAVQ#52	
1091	REF	1	LAST	944		14,3674	31755	1		INDEX	STARINC	
1092	REF	0	LAST	922		14,3675	02075	1		CA	R52I	PICK LP STARCODE DETERMINED BY R56
1093						14,3676	73772	1		EXTEND		
1094	REF	1				14,3677	64744	1		MP	1/6TH	
1095	REF	33	LAST	900		14,3700	54734	1		AD	BIT8	SET DEFINT POSITION 2
1096	REF	2	LAST	100		14,3701	54734	1		TS	STARCODE	SCALE AND STORE IN STARCODE
1097	REF	1				14,3702	04616	1	R52A	CAF	VCIN7	
1098	REF	276	LAST	945		14,3703	20477	1		TC	BANKCALL	
1099	REF	32	LAST	929		14,3704	04616	1		CADR	GCFLASH	DISPLAY STARCODE AND WAIT FOR RESPONSE
1100	REF	47	LAST	944		14,3705	13707	0		TC	GCOPCON	V34-TERMINATE
1101	REF	1				14,3706	13707	0		TCF	P52R	V33-PROCEED TO ORIENT LEM
1102	REF	1				14,3707	05516	0	R52B	TCF	R52A	ENTER-SELECT NEW STARCODE-PRECYCLE
1103	REF	94	LAST	888		14,3708	05516	0		TC	DOWNFLAG	
1104	REF	7	LAST	747		14,3709	00124	0		ADPFS	3AXISFLG	BIT6 OF FLAGWRDS ZERO TO ALLOW VECPOINT
1105	REF	3	LAST	949		14,3710	00124	1		CA	STARCODE	GPAP DEFINT CODE
1106	REF	3	LAST	682		14,3711	00006	1		MASK	HIGH5	
1107						14,3712	00006	1		EXTEND		
1108	REF	23	LAST	858		14,3713	00006	1		MP	BIT9	
1109	REF	161	LAST	917		14,3714	54071	1		TS	L	TEMP STORE DEFINT
1110						14,3715	63735	0		EXTEND		
1111	REF	1				14,3716	63735	0		RZMF	CETAZEL	CODE 0, CCAS CALIBRATION
1112	REF	2	LAST	246		14,3717	63735	1		AD	NEG7	
1113						14,3718	00006	1		EXTEND		
1114	REF	2	LAST	949		14,3719	13735	1		RZF	GFTAZEL	CODE 7, CCAS SIGHTING
1115	REF	17	LAST	260		14,3720	00006	1		FBANK=	XYMARK	
1116	REF	15	LAST	896		14,3721	00006	1		CA	EBANK7	
1117	REF	51	LAST	911		14,3722	54071	0		TS	FRANK	

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1118	REF	162	LAST	948	14,2725	50 011 0	INDEX	L	
1119	REF	4	LAST	247	14,2726	3 1413 1	CA	ACTAZ -1	PICK UP AZ CORRESPONDING TO DETENT
1120	REF	163	LAST	949	14,2727	54 001 1	TS	L	
1121	REF	10	LAST	946	15,1 42		EBANK=	XSM	
1122	REF	12	LAST	885	14,2731	3 5114 1	CA	CBANK5	CHANGE TO EBANK5 BUT DONT DISTURB L
1123	REF	52	LAST	948	14,2731	54 003 0	TS	FRANK	
1124	REF	36	LAST	830	14,2732	3 4737 0	CA	BIT13	SET ELV TO 45 DEG
1125	REF	144	LAST	945	14,2733	56 001 0	XCH	L	SET C(A)=AZ, C(L)=45 DEG
1126	REF	1			14,2734	1 3745 0	TCF	AZEL	GC COMP OPTIC AXIS
1127	REF	1			14,2735	3 3774 0	GETAZEL	CAF	V06NR7
1128	REF	279	LAST	948	14,2736	0 4616 1	TC	BANKCALL	CODE C OF 7, GET AZ AND EL KEY IN
1129	REF	23	LAST	948	14,2737	2 4477 1	CADR	GOFLASH	
1130	REF	48	LAST	948	14,2740	0 6111 0	TC	GCTOPCH	V34-TERMINATE
1131					14,2741	1 2742 0	TCF	+2	PROCEED-CALC OPTIC AXIS
1132	REF		LAST	948	14,2742	1 3735 1	TCF	GFTAZEL	ENTER-RECYCLE
1133					14,2743	0 0776 1	EXTEND		
1134	REF	4	LAST	310	14,2744	3 1345 1	DCA	AZ	PICK UP AZ AND EL IN SP 2S COMP
1135	REF	24	LAST	941	14,2745	5 120 1	INDEX	FIXLCC	JAM AZ AND EL IN 8 AND 9 OF VAC
1136					14,2746	52 011 0	XCH	RD	
1137	REF	192	LAST	945	14,2747	1 5142 1	TC	INTPRET	
1138					14,2750	77624 1	CALL		GO COMPUTE OPTIC AXIS AND STORE IN
1139	REF	2	LAST	248	14,2751	1 520 1		CANR	SCAXIS IN NO CCGRES
1140					14,2752	45134 1	RTB	CALL	
1141	REF	26	LAST	934	14,2752	21574 1		LCADTIME	
1142	REF	5	LAST	944	14,2754	32472 1		PLANGT	
1143					14,2755	53521 1	MXV	UNIT	
1144	REF	47	LAST	946	14,2756	01724 1		REFSMAT	
1145	REF	7	LAST	781	14,2757	03773 1	STORE	POINTVSM	STORE FOR VECPOINT
1146					14,2760	77776 1	EXIT		
1147	REF	281	LAST	945	14,2761	0 4616 1	TC	BANKCALL	
1148	REF	6	LAST	782	14,2762	54123 1	CADR	R6-LEM	GO TORQUE LEM OPTIC AXIS TO STAR LCS
1149	REF	4	LAST	948	14,2763	3 7747 1	CAF	HIGH9	
1150	REF	4	LAST	948	14,2764	7 234 0	MASK	STARCODE	IF COAS CALIPRATION CODE 0, RECYCLE
1151					14,2765	0 2116 1	EXTEND		
1152	REF	2	LAST	948	14,2766	1 3701 0	PZF	P52A	
1153	REF	183	LAST	940	14,2767	1 5142 1	TC	INTPRET	RETURN FROM KALCMANU
1154					14,2770	77651 1	GCTC		
1155	REF	2	LAST	948	14,2771	02665 1		SAVQR52	RETURN TO CALLER
1156					14,2772	05253 0	DEC	01666607	
1157					14,2773	03 6 1	VM	0170	
1158					14,2774	1527 0	VM	060197	

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P1150 LUMAP SURFACE STAR ACQUISITION

1160					15,2245				RANK	15	
1161	REF	3	LAST	920	15,2246				SETLCC	P515	
1162					15,2246				RANK		
1163	REF	2	LAST	250 TC	251:	40	40*		COUNT*	11/R59	
1164	REF	15	LAST	871	15,2245	4	277	0	CS	FLAGWRD3	
1165	REF	3	LAST	214	15,2246	7	4737	1	MASK	REFSMAT	IF REFSMAT FLAG CLEAR BYPASS STAR ACQUIR
1166	REF	284	LAST	921	15,2247	10	000	0	CCS	A	
1167	REF	1			15,2250	1	2455	0	TCF	P59CLT	NO REFSMAT GO TO ANIMARK
1168	REF	1			15,2251	3	2463	1	CAF	V01N70*	SELECT STAR CODE FOR ACQUISITION
1169	REF	281	LAST	945	15,2252	0	4616	1	TC	RANKCALL	
1170	REF	34	LAST	949	15,2253	20	477	1	CADR	GCEFLASH	
1171	REF	45	LAST	949	15,2254	0	6	01	TC	CCTOPPOH	V34-TERMINATE
1172	REF	1			15,2255	1	2257	1	TCF	P59A	V33-PROCEED
1173	REF	1			15,2256	1	2245	1	TCF	P59	V32-RECYCLE
1174	REF	5	LAST	945	15,2257	4	7747	0	CS	F1GHS	GRAB STARCODE FOR INDEX
1175	REF	9	LAST	317	15,2260	7	5734	0	MASK	ACTCCCE	
1176					15,2261	0	0006	1	EXTEND		
1177	REF	2	LAST	294	15,2262	7	6245	0	MP	REVCNT	JUST 6
1178	REF	165	LAST	945	15,2263	56	001	0	XCH	L	
1179	REF	11	LAST	948	15,2264	51	757	0	INDEX	STARIND	
1180	REF	10	LAST	948	15,2265	55	755	0	TS	BESTI	
1181	REF	35	LAST	945	15,2266	50	120	1	INDEX	FIXLCC	
1182	REF	25	LAST	931	15,2267	54	046	1	TS	XI	CODE X 6 FOR CATLOG STAR INDEX
1183					15,2270	0	0006	1	EXTEND		
1184	REF	2	LAST	957	15,2271	1	2455	0	BZF	P59CLT	BYPASS ACQUISITION IF NOT CATLOG STAR
1185					15,2272	4	0000	0	CCM		
1186	REF	1			15,2273	6	2567	1	AD	DEC227	
1187					15,2274	0	0006	1	EXTEND		
1188	REF	2	LAST	950	15,2275	6	2455	1	BZMF	P59CLT	
1189	REF	194	LAST	945	15,2276	1	6042	1	TC	INTERPT	
1190					15,2277	64	373	1	VLCAP*	MXV	
1191	REF	11	LAST	933	15,2300	22	347	1		CATLCC,1	GRAB STAR VECTOR
1192	REF	48	LAST	949	15,2301	0	1734	0		REFSMAT	TRANSFORM TO SM
1193					15,2302	45	056	0	UNIT	CALL	
1194	REF	3	LAST	777	15,2303	47	650	1		CCL*SMAB	
1195	REF	3	LAST	241	15,2304	0	2731	0	STORE	STAR	TEMP STORE STAR VEC(NB)
1196					15,2305	77	776	1	EXIT		
1197	REF	44	LAST	944	15,2306	3	4753	1	CAF	RJT1	INITIALIZE AZ POSITION CODE TO 1 (-60)
1198	REF	2	LAST	317	15,2307	55	241	0	TS	POSCODE	
1199	REF	15	LAST	948	17,1551				EBANK=	XYMAFK	
1200	REF	16	LAST	948	15,2310	2	5016	0	CA	FRANK7	INCAZ
1201	REF	53	LAST	945	15,2311	54	003	0	TS	EBANK	

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1202	REF	3	LAST	950	15,2312	51241 1	INDEX	POSCODE	
1203	REF	5	LAST	949	15,2313	3 1473 1	CA	ACTAZ -1	PICK UP AZ CORRESPONDING TO POSCODE
1204	REF	166	LAST	950	15,2314	54 51 1	TS	L	
1205	REF	2	LAST	949	15,2315	3 5014 1	FRANK=	XSL	
1206	REF	13	LAST	949	15,2315	3 5014 1	CA	FRANK5	
1207	REF	54	LAST	950	15,2316	54 51 3 0	TS	FRANK	
1208	REF	27	LAST	949	15,2317	3 4737 0	CA	BIT13	SET ELV TO 45 DEG
1209	REF	177	LAST	951	15,2320	56 51 1	XCH	L	SET C(A)=AZ, C(L)=45 DEG
1210	REF	12	LAST	949	15,2321	55 1745 1	TS	QMIN	STORE QMIN=AZ FOR LATERR
1211	REF	26	LAST	951	15,2322	50 120 1	INDEX	FIXLCC	
1212					15,2323	52 511 0	XCH	8D	JAM AZ IN 8D, 45 DEG IN 9D FOR CORR
1213	REF	165	LAST	950	15,2324	0 5042 1	TC	INTERPT	
1214					15,2325	77624 1	CALL		
1215	REF	3	LAST	949	15,2326	1 520 1		PANR	GE CALC OPTIC AXIS WRT NE
1216					15,2327	52375 0	VLCAC	PCT	
1217	REF	4	LAST	950	15,2330	02731 0		STAR	PCT STAR WITH CA
1218	REF	24	LAST	731	15,2331	03765 0		SCAXIS	
1219					15,2332	65552 0	SLI	ARCCOS	
1220					15,2333	00 51 1	STORE	24D	TEMP STORE ARCCOS(STAR.CPTAXIS)
1221					15,2334	51125 1	DSU	RPL	
1222	REF	2	LAST	251	15,2335	22466 1		DFG3D	SEE IF STAR IN AOT FIELD-OF-VIEW
1223	REF	1			15,2336	32420 0		NXAX	NOT IN FIELD - TRY NEXT POSITION
1224					15,2337	45345 1	DLCAC	DSU	SEE IF STAR AT FIELD CENTER
1225					15,2340	00031 0		24F	
1226	REF	1			15,2341	32471 0		DIG.5	
1227					15,2342	71241 1	PMN	DLCAC	CALC SPIRAL AND CURSOR
1228	REF	1			15,2343	32412 0		ZSPCR	GE ZERO CURSOR AND SPIRAL
1229					15,2344	00031 0		24D	GET SPIRAL
1230					15,2345	42405 0	DMF	S14	
1231	REF	1			15,2346	12742 0		3/4	12 SCALED AT 16
1232					15,2347	24031 0	STCVL	24F	12(ARCCOS(AO.STAR)) SCALED IN REVS
1233	REF	25	LAST	951	15,2350	03765 0		SCAXIS	CA
1234					15,2351	53435 0	VXV	UNIT	
1235	REF	2	LAST	37	15,2352	240 5 1		XLUNIT	
1236					15,2353	472 6 0	PLSH	VXV	CA X UNITX FD 3-5
1237	REF	26	LAST	951	15,2354	03765 0		SCAXIS	
1238					15,2355	77676 0	VCCMF		
1239					15,2356	63256 0	UNIT	PDVL	UNIT(CA X(CA X UNITX)) FD 6-11
1240	REF	27	LAST	951	15,2357	03765 0		SCAXIS	
1241					15,2360	53435 0	VXV	UNIT	
1242	REF	5	LAST	951	15,2361	02731 0		STAR	
1243					15,2362	53216 0	PUSH	PCT	1/2(CA X STAR) PD 12-17
1244					15,2363	000 1 0			PCT WITH 1/2(CA X UNITX) FOR YROT
1245					15,2364	65552 0	SLI	ARCCOS	
1246					15,2365	24033 1	STCVL	26D	STORE THET SCALED IN REVS

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1247				15,2366	77641 1	DOT		LP 12-17, UP 6-11 FOR C2
1248				15,2367	71244 0	BPL	OLGAD	IF THET NEG-GET 360-THET
1249	REF	1		15,2370	32375 1		R59D	
1250	REF	2	LAST	15,2371	32047 0		RECUTCAE	
1251				15,2372	77625 0	DSL		
1252				15,2373	00033 1		26D	
1253				15,2374	00033 1	STCRF	26D	360-THET SCALED IN REVS
1254				15,2375	70535 0	P59D	SLOAD	
1255	REF	13	LAST	15,2376	02746 0		QMIN	RESCALE AZ(N) TO REVS
1256				15,2377	41415 1	CAD	PUSH	PUSH YRCT + AZ(N) REVS
1257				15,2400	77633 1		26D	
1258				15,2401	77634 0	RTP		
1259	REF	2	LAST	15,2402	21615 0		1STC2S	
1260	REF	3	LAST	15,2403	15236 1	STOCL	CLFSOP	YRCT IN 1/2 REVS
1261				15,2404	00031 0		24D	LOAD SROT IN REVS
1262				15,2405	77615 0	CAD		12(SEP) + YRCT
1263				15,2406	77634 0	RTB		
1264	REF	3	LAST	15,2407	21615 0		1STC2S	
1265	REF	3	LAST	15,2410	01240 0	STORE	SPIRAL	SROT IN 1/2 REVS
1266				15,2411	77776 1	EXIT		
1267	REF	1		15,2412	1 2427 1	TCF	79DISP	GC DISPLAY CURSOR-SPIRAL-PGS CODE
1268				15,2413	77776 1	ZSPCR	EXIT	
1269	REF	181	LAST	15,2414	3 4755 1	CAF	ZFFC	STAR ALMOST OPTIC AXIS, ZERO CURSOR
1270	REF	4	LAST	15,2415	550235 0	TS	CURSOR	AND SPIRAL ANGLES
1271	REF	4	LAST	15,2416	550237 1	TS	SPIRAL	
1272	REF	2	LAST	15,2417	1 2427 1	TCF	79DISP	
1273				15,2420	77776 1	VXAX	EXIT	
1274	REF	4	LAST	15,2421	250241 1	IACF	PCSCCCE	
1275	REF	5	LAST	15,2422	4 1241 0	CS	PCSCCCE	
1276	REF	12	LAST	15,2423	6 4757 0	AD	SEVEN	
1277				15,2424	0 0006 1	EXTEND		
1278	REF	1		15,2425	6 2427 1	RZMF	R59ALM	THIS STAR NOT AT ANY POSITION
1279	REF	1		15,2426	1 2311 0	TCF	INCAZ	
1280	REF	28	LAST	15,2427	0 5567 0	R59ALM	TC	ALARM
1281				15,2430	00404 1	OCT	404	THIS STAR CANT BE LOCATED IN ACT FIELD
1282	REF	2	LAST	15,2431	3 5006 1	CAF	VR05A09	DISPLAY ALARM
1283	REF	282	LAST	15,2432	0 4616 1	TC	RANKCALL	
1284	REF	35	LAST	15,2433	20477 1	CACR	COFLASH	
1285	REF	50	LAST	15,2434	1 6001 1	TCF	GETCPCCH	VB34-TERMINATE
1286	REF	4	LAST	15,2435	1 2455 0	TCF	R59CLT	VB33-FRCCFED, GC WITHOUT ACQUIRE
1287	REF	2	LAST	15,2436	1 2245 1	TCF	R59	VB32-RECYCLE AND TRY ANOTHER STAR
1288	REF	1		15,2437	3 2464 0	79DISP	CAF	VR06A79
1289	REF	283	LAST	15,2440	0 4616 1	TC	RANKCALL	DISPLAY CURSOR, SPIRAL AND PGS CODE
1290	REF	36	LAST	15,2441	20477 1	CACR	COFLASH	
1291	REF	51	LAST	15,2442	1 6001 1	TCF	GETCPCCH	VB34-TERMINATE

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1292	RFF	1		15,2443	1 2445 1	TCF	R59F	V33-PROCEED TO MARK ROUTINE		
1293	RFF	3	LAST	952	15,2444	1 2445 1	TCF	R59F	V32-RECYCLE TO TCF OF R59 AGAIN	
1294	RFF	13	LAST	952	15,2445	3 4757 0	R59F	CAF	SEVEN	GET DETENT CODE CORRESPONDING TO PCSCODE
1295	RFF	6	LAST	952	15,2446	7 1241 0		MASK	PCSCODE	
1296					15,2447	1 1 6 1		EXTEND		
1297	RFF	23	LAST	952	15,2450	7 4745 1		MF	BIT7	DETENT CODE NOW IN L
1298	RFF	6	LAST	952	15,2451	4 7747 0		CS	HIGH9	
1299	RFF	10	LAST	952	15,2452	7 0734 1		MASK	ACTCODE	ISOLATE STAR NO IN BIT 1-6
1300	RFF	168	LAST	951	15,2453	6 0011 0		AF	L	
1301	RFF	11	LAST	953	15,2454	54 774 0		IS	ACTCODE	STORE DETENT 7-9
1302	RFF	264	LAST	952	15,2455	0 4616 1	R59OUT	TC	BANKCALL	GO TO ACTMARK FOR SIGHTING
1303	RFF	3	LAST	942	15,2456	16000 0		CADR	ACTMARK	
1304	RFF	285	LAST	952	15,2457	0 4616 1		TC	BANKCALL	
1305	RFF	2	LAST	942	15,2460	1 7714 1		CAEF	ACTSTALL	SLEEP TILL SIGHTING DONE
1306	RFF	7	LAST	945	15,2461	0 57 1 1		TC	CLPTAINS	EACEND RETURN FROM ACTMARK
1307	RFF	1			15,2462	1 3127 1		TCF	SECRET	RETURN TO 1 STAR OR 2STAR
1308					15,2463	00306 1	VC1N70*	VN	170	
1309					15,2464	01517 0	VC6N75	VN	675	
1310					15,2465	12525 1	DFC3)	2DFC	.083333333	30 DEGRESS
1311					15,2466	12525 0				
1311					15,2467	00 26 0	DEG.5	2DFC	.00138888	.5 DEGRESS SCALED IN REVS
1311					15,2470	30131 1				
1312					15,2471	12525 0	DIG60	CDT	12525	60 DEG DEU SCALING
1313	RFF	16	LAST	926	1235		CURSOR	EQUALS	GET/2	
1314	RFF	17	LAST	953	1237		SPIRAL	EQUALS	GET/2 +2	
1315	RFF	18	LAST	953	1241		PCSCODE	EQUALS	GET/2 +4	

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P1316 NAME - PLANET
 P1317 FUNCTION - TO PROVIDE THE REFERENCE VECTOR FOR THE SIGHTED CELESTIAL
 P1318 BODY. STARS ARE FETCHED FROM THE CATALOG, SUN, EARTH AND
 P1319 MOON ARE COMPUTED BY LCCSAM, PLANET VECTORS ARE ENTERED
 P1320 BY OSDY INPUT
 P1321 CALL - CALL
 P1322 PLANET
 P1323 INPUT - TIME IN MPAC
 P1324 OUTPUT - VECTOR IN MPAC
 P1325 SUPPLEMENTS - LCCSAM
 P1326 OFFSETS - VAC, STARAD - STARAD +17

1327	REF	4	LAST	950	15,2472		SETLOC P51S
1328					15,2472		RANK
1329	REF	1					COUNT* #1/P51
1330	REF	8	LAST	944	15,2472	2562 0	PLANET STORE TSIGHT
1331					15,2473	77420 1	STQ EXIT
1332	REF	4	LAST	246	15,2474	02736 1	GCTP
1333	REF	7	LAST	953	15,2475	4 7747 0	CS HIGH9
1334	REF	12	LAST	953	15,2476	7 0734 0	MASK ACTCODE
1335					15,2477	0 0006 1	EXTEND
1336	REF	3	LAST	950	15,2500	7 6245 0	MP REVCNT
1337	REF	169	LAST	953	15,2501	56 001 0	XCF L
1338	REF	12	LAST	950	15,2502	511757 0	INDEX STAPIND
1339	REF	11	LAST	950	15,2503	551755 0	TS BEST1
1340	REF	285	LAST	950	15,2504	10 000 0	CCS A
1341	REF	1			15,2505	1 2521 1	TCF ACTPLAN
1342	REF	1			15,2506	3 2560 0	CAF VAPLANV
1343	REF	286	LAST	953	15,2507	0 4616 1	TC BANKCALL
1344	REF	37	LAST	952	15,2510	20477 1	CADR GCFEASH
1345					15,2511	0 2505 0	TC -3
1346					15,2512	0 2514 0	TC +2
1347					15,2513	0 2516 0	TC -5
1348	REF	156	LAST	951	15,2514	0 6342 1	TC INTPEFT
1349					15,2515	53575 0	VLCAD UNIT
1350	REF	21	LAST	944	15,2516	02707 0	STARAD
1351					15,2517	77650 1	GCTC
1352	REF	5	LAST	954	15,2520	02736 1	GCTP
1353	REF	286	LAST	954	15,2521	4 5000 0	ACTPLAN CS A
1354	REF	2	LAST	950	15,2522	6 2557 1	AD DEC227
1355					15,2523	0 0006 1	EXTEND
1356	REF	1			15,2524	6 2535 0	PZMC CALSAM1
1357	REF	13	LAST	954	15,2525	511757 0	INDEX STAPIND
1358	REF	12	LAST	954	15,2526	3 1755 1	CA BEST1
1359	REF	37	LAST	951	15,2527	50 120 1	INDEX FIXLOC
1360	REF	26	LAST	950	15,2530	54 246 1	TS X1
1361	REF	197	LAST	954	15,2531	0 6342 1	TC INTPEFT
1362					15,2532	52173 0	VLCAD* GCTC
1363	REF	12	LAST	950	15,2533	37347 1	CATALOG, 1

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1364	REF	6	LAST	954	15,2534	02736	1		GCTR
1365	REF	159	LAST	954	15,2535	05742	1	CALSAM1	TC
1366					15,2536	45145	0	CALSAM	FLCAD
1367	REF	9	LAST	954	15,2537	02562	0		CALL
1368	REF	3	LAST	934	15,2540	30500	1		TSIGHT
1369					15,2541	77340	0		LOC SAM
1370	REF	14	LAST	954	15,2542	02757	0		LXC,1
1371	REF	5	LAST	928	15,2543	02707	0		VLCAD
1372					15,2544	24001	0		STARIND
1373	REF	4	LAST	928	15,2545	02715	0		VEARTH
1374	REF	6	LAST	955	15,2546	26707	0		OD
1375					15,2547	00011	0		VSUN
1376	REF	0	LAST	955	15,2550	02715	0		OD
1377					15,2551	70143	0		STOPS
1378	REF	12	LAST	954	15,2552	02756	1		VSUN
1379	REF	372	LAST	522	15,2553	00154	1		FLCAD*
1380					15,2554	52173	0		LXC,1
1381	REF	20	LAST	954	15,2555	02343	1		BESTI,1
1382	REF	7	LAST	955	15,2556	02736	1		MFAC
1383					15,2557	00743	0		VLCAD*
1384					15,2560	01530	0		GCTR
1385	REF	4	LAST	852	37,1541				STARAD -228E,1

DEC227 DEC

VAMPLANV VN

PIOSPINE =

GCTR

227

0688

PIPASR +3

FRANK ACT 4 SC CONT LOAD PIPTIME1

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P1386 GRAVITY VECTOR DETERMINATION ROUTINE
R1387 BY KEN VINCENT
R1388 FOR DETAILED DESCRIPTION SEE 504GSCOP 5.6.3.2.5
R1389 THIS PROGRAM FINDS THE DIRECTION OF THE MOONS GRAVITY
R1390 WHILE THE IM IS ON THE MOONS SURFACE. IT WILL BE USED
R1391 FOR LUNAR SURFACE ALIGNMENT. THE GRAVITY VECTOR IS
R1392 DETERMINED BY READING THE PIPAS WITH THE IMU AT TWO
R1393 PARTICULAR ORIENTATIONS. THE TWO READINGS ARE AVERAGED
R1394 AND UNITIZED AND TRANSFORMED TO NR COORDINATES. THE TWO
R1395 ORIENTATIONS WERE CHOSEN TO REDUCE BIAS ERRORS IN THE
R1396 READINGS.
R1397
R1398 CALL-
R1399     TO     BANKCALL
R1400     CACX   CVDETER
R1401 INFLTS-
R1402     PIPAS,CDLS
R1403 OUTPUTS-
R1404     STASAVI = UNIT GRAVITY
R1405     GSAV    = UNITD
R1406     GRAVBIT = 1
R1407 SUBROUTINES-
R1408     PIPASP, IMUCDAPS, IMUINF, IMESTALL, I/PIPA, DELAYJCR, COLTRIG,
R1409     *NPSM*, *SNMP*, CALCOCA, ECFLASH
R1410 DEPRIS-
R1411     VAR, SAC, STAPAD, XSM, XNR, THETAD, DELV, CESCUL, SINCDL
R1412 REF 1      15,2561 3 2762 0 CVDETER CAF 420FG
R1413 REF 14 LAST 942 15,2562 54 321 0 TS THETAD
R1414      15,2563 4 3000 0 CCM
R1415 REF 15 LAST 956 15,2564 54 322 0 TS THETAD +1
R1416 REF 1      15,2565 2 2763 1 CAF 350EG
R1417 REF 16 LAST 956 15,2566 54 323 1 TS THETAD +2
R1418 REF 19 LAST 956 15,2567 0 6142 1 TC INTPPET
R1419      15,2570 45014 0 CLEAR CALL
R1420 REF 4 LAST 944 15,2571 01662 1 REFSMFLG
R1421 REF 1      15,2572 32666 0 LUNG
R1422 FIND CIMPAL ANGLES WHICH ROTATE SM 180DEG APOLT C VEC
R1423
R1424 DEFINE C COOR SYS
R1425     -
R1426     X UNIT G
R1427     * - -
R1428     Y = UNITEZSV * X )
R1429     - -
R1430     Z UNIT(X * Y )
R1431 THEN ROTATED SM WPT PRESENT IS
R1432
R1433
R1434
R1435     1. 0, 0
R1436     * *T * * *

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R1436 XSM = M C, -1, C M = 2 (X X) - 1/2 I *
 R1437 J J
 R1438 U, J, -1
 R1439

R1440 ALLOC MP WPT PRES SM IS
 R1441
 R1442 * * *
 R1443 XNR = NCS I
 R1444 * *
 R1445 (TEMP) ANCL S = CALCGA(XSM, XNR)
 R1446

1447 DEF 5 LAST 954 15,2570
 1448 15,2573
 1449 DEF 1
 1450 15,2573 66770 0
 1451 15,2574 71122 1
 1452 DEF 17 LAST 946 15,2575 93151 0
 1453 15,2576 99006 1
 1454 15,2577 77744 0
 1455 DEF 11 LAST 957 15,2600 00150 1
 1456 15,2601 45173 0 GRAVEL
 1457 DEF 4 LAST 951 15,2602 54110 0
 1458 DEF 5 LAST 879 15,2603 47675 0
 1459 DEF 6 LAST 946 15,2604 06777 1
 1460 15,2605 77775 1
 1461 DEF 6 LAST 951 15,2606 02721 0
 1462 15,2607 73744 1
 1463 DEF 15 LAST 873 15,2610 00147 1
 1464 DEF 7 LAST 957 15,2611 75140 1
 1465 15,2612 71152 1
 1466 DEF 16 LAST 957 15,2613 00047 1
 1467 15,2614 62147 1
 1468 DEF 5 LAST 957 15,2615 54010 0
 1469 15,2616 00012 0
 1470 DEF 21 LAST 951 15,2617 35665 1
 1471 15,2620 45100 1
 1472 DEF 1 15,2621 22601 1
 1473 DEF 3 LAST 946 15,2622 47355 1
 1474 15,2623 74575 0
 1475 DEF 1 15,2624 12715 0
 1476 DEF 22 LAST 955 15,2625 36723 1
 1477 DEF 2 LAST 956 15,2626 32666 0
 1478 15,2627 74575 0
 1479 DEF 2 LAST 957 15,2630 02715 0
 1480 15,2631 53455 0
 1481 DEF 24 LAST 957 15,2632 02723 0
 1482 DEF 7 LAST 944 15,2633 02761 0
 1483 15,2634 77641 1
 1484 DEF 6 LAST 785 15,2635 02231 0
 1485 15,2636 65552 0

SFTLCC P505

RANK

COUNT* 44/P57

AXT,1 SSF

X1=19

180

S1=6

S1

X2, -2

60

LXC,2

S1

VICAD* CALL

XUNIT -6,2

AFSA

SIN AND COS COMPUTED IN LUNG

STORE XNR +180,1

VLCAL

STAR

LXC,2 VXS*

COMPLEMENT- UNITX ARE BACKWARD -

X2

STAR +6,2

CLIFF EFFECT

VSL2 LXC,2

X2

VSL* INCR,2

XUNIT -6,2

20

STORE XSM +180,1

TIX,1 CALL

GRAVEL

CALCGA

VICAD VSR1

GCLT

STCALL STARAF +120

LLNG

VLOAD VSR1

GCLT

VAD UNIT

STARAF +120

STORE STARSAT1

DOT

GSAV

SL1 ACOS

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1486	REF	29	LAST	921	15,2637	11045 1	STORE	CSPTM1	
1487					15,2640	77776 1	EXIT		
1488	REF	95	LAST	948	15,2641	0 5515 0	TC	DOWNFLAG	CLEAR FREEFLAG IN CASE OF RECYCLE
1489	REF	8	LAST	944	15,2642	00114 1	ADRES	FREEFLAG	
1490	REF	1			15,2643	3 2761 0	CA	DISGRVER	
1491	REF	287	LAST	954	15,2644	0 4616 1	TC	BANKCALL	
1492	REF	28	LAST	954	15,2645	20477 1	CADR	CCFLASH	
1493	REF	52	LAST	952	15,2646	0 6001 0	TC	GETCPCCH	
1494	REF	1			15,2647	1 2652 0	TCF	PROGRAV	VP33-PROCEED
1495	REF	65	LAST	888	15,2650	0 5504 0	TC	UPFLAG	VE32-RECYCLE-STORE GRAV AND EN IT AGAIN
1496	REF	9	LAST	958	15,2651	000114 1	ADRES	FREEFLAG	AND SET FREEFLAG TO SHOW RECYCLE
1497	REF	52	LAST	944	15,2652	0 5353 1	PROGRAV	TC	PHASCHNG
1498					15,2653	04024 0	CCT	04024	
1499	REF	200	LAST	956	15,2654	0 6042 1	TC	INTPST	
1500					15,2655	77775 1	VLCAD		
1501	REF	8	LAST	957	15,2656	02761 0		STAPSAV1	
1502	REF	7	LAST	957	15,2657	02231 0	STORE	GSAY	
1503					15,2660	77776 1	EXIT		
1504	REF	1			15,2661	3 4751 0	CAF	FREEFBIT	IF FREEFLAG SET, RE-COMPUTE GRAVITY.
1505	REF	28	LAST	900	15,2662	7 0074 0	MASK	FLAGWPD1	
1506	REF	287	LAST	954	15,2663	10 000 0	CCS	A	
1507	REF	1			15,2664	1 2561 0	TCF	GVDTTER	SET
1508	REF	1			15,2665	1 3536 0	TCF	ATTCHK	EXIT FROM GVDTER
1509					15,2666	77220 1	LUNG	STQ	
1510	REF	14	LAST	952	15,2667	02745 0		VLCAD	
1511	REF	4	LAST	945	15,2670	24007 0		GMIN	
1512	REF	1			15,2671	02707 0		ZEROVEC	
1513					15,2672	77776 1	STORE	GACC	
1514	REF	93	LAST	958	15,2673	0 5353 1	EXIT		
1515					15,2674	04024 0	TC	PHASCHNG	
							CCT	04024	
1516	REF	201	LAST	958	15,2675	0 6042 1	TC	INTPST	
1517					15,2676	77624 1	CALL		
1518	REF	4	LAST	945	15,2677	31557 1		CCARSE	
1519					15,2700	77776 1	EXIT		
1520	REF	1			15,2701	3 2760 1	CA	T/2SFC	
1521	REF	8	LAST	955	15,2702	551735 0	TS	CCTR	
1522	REF	4	LAST	855	15,2703	3 7721 1	CA	PRICP1	
1523	REF	10	LAST	945	15,2704	551074 1	TS	1/P1PADT	
1524	REF	288	LAST	958	15,2705	0 4616 1	TC	BANKCALL	
1525	REF	1			15,2706	15707 0	CADR	GCOMPZER	INITIALIZE COMPENSATION
1526	REF	54	LAST	958	15,2707	0 5353 1	TC	PHASCHNG	
1527					15,2710	04024 0	CCT	04024	
1528	REF	285	LAST	958	15,2711	0 4616 1	TC	BANKCALL	DO NOT NEED TO INHIBIT THIS USED TO
1529	REF	1			15,2712	77541 1	CADR	PIFSPIN	INITIALIZE PIPAS CONT USE DATA

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1530	REF	202	LAST	958	15,2713	0 6042 1	TC	INTPRET	
1531					15,2714	77776 1	GRAB	EXIT	= MASK 7776 IN BASIC SO FONT CARE
1532	REF	5	LAST	852	15,2715	0 5173 1	CAF	2SECS	
1533	REF	26	LAST	893	15,2716	0 5173 1	TC	TWIDDLE	SET UP 2 SEC TASK TO READ PIPAS
1534	REF	1			15,2717	02721 1	ADRES	GRABGRAV	
1535	REF	141	LAST	921	15,2720	0 5155 0	TC	ENDJOB	
1536	REF	47	LAST	917	15,2721	0 4674 0	GRABGRAV	TC	IPAKCALL
1537	REF	2	LAST	958	15,2722	77541 1	CAF	PIPSRINE	
1538	REF	2	LAST	738	15,2723	0 5023 0	CAF	PR1013	RE-ESTABLISH MAINLINE JOB
1539	REF	40	LAST	868	15,2724	0 5105 0	TC	FINDVAC	
1540	REF	25	LAST	957	05,17 6		FRANK=	STARAP	
1541	REF	1			15,2725	02730 1	2CAFR	ADDGRAV	
1541	REF	1			15,2726	22065 0			
1542	REF	66	LAST	900	15,2727	0 5261 1	TC	TASKOVER	
1543	REF	25	LAST	958	15,2730	0 4616 1	ADDGRAV	TC	BANKCALL
1544	REF	2	LAST	855	15,2731	15271 1	CAF	1/FIPA	
1545	REF	9	LAST	958	15,2732	257736 1	INCR	GCTP	
1546	REF	213	LAST	955	15,2733	0 6042 1	TC	INTPRET	
1547					15,2734	52275 0	VLQAD	VAD	
1548	REF	9	LAST	905	15,2735	00325 0		DELV	
1549	REF	2	LAST	958	15,2736	02707 0		GACC	
1550	REF	3	LAST	959	15,2737	02707 0	STORE	GACC	ACCUMULATE G VECTOR
1551					15,2740	50135 0	SLEAD	BMM	
1552	REF	1	LAST	955	15,2741	02737 0		GCTR	
1553	REF	1			15,2742	32714 1		GREED	
1554					15,2743	53575 0	VICAF	UNIT	
1555	REF	4	LAST	955	15,2744	02707 0		GACC	
1556	REF	8	LAST	957	15,2745	36731 1	STCALL	STAR	
1557	REF	6	LAST	946	15,2746	47541 1		COUFIG	TRANSFORM IN NB COOR AND STORE IN OUTPUT
1558					15,2747	77624 1	CALL		
1559	REF	7	LAST	955	15,2750	47673 0		*SMNP*	
1560	REF	3	LAST	957	15,2751	02715 0	STORE	GFLT	
1561					15,2752	77775 1	EXIT		
1562	REF	56	LAST	958	15,2753	0 5253 1	TC	PHASCFNG	
1563					15,2754	04 24 0	OCT	04,24	
1564	REF	274	LAST	955	15,2755	0 6242 1	QMINEXIT	TC	INTPRET
1565					15,2756	77650 1	ECTC		
1566	REF	15	LAST	958	15,2757	02745 0		QMIN	
1567					15,2760	77753 0	T/2SEC	DFC	-20
1568					15,2761	01414 0	DISGRVER	VA	0604
1569					15,2762	07357 1	42DFC	OCT	07257
1570					15,2763	06211 0	35DFC	OCT	06211

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R1571 NAME CYBOTRIM
R1572
R1573 THIS PROGRAM COMPUTES AND SENDS GYRO COMMANDS WHICH CAUSE THE CDLS
R1574 TO ATTAIN A PRESCRIBED SET OF ANGLES. THIS ROUTINE ASSUMES THE
R1575 VEHICLE ATTITUDE REMAINS STATIONARY DURING ITS OPERATION.
R1576
R1577 CALL CALL
R1578 CYBOTRIM
R1579
R1580 INPUT THETA0,+1,+2 = DESIRED CDL ANGLES
R1581 CDUX,CDUY,CDUZ
R1582
R1583 OUTPUT - CYRO TORQUE PULSES
R1584
R1585 SUPPLINES- TRG*NRSM,*NRSM*,CDLTRIC,AXISGEN,CALCGTA,IMPUFNF
R1586 IMPULSE,INSTALL
R1587
R1588 - - - * * -
R1589 C H R I S - CDLSPOT ,SINCDL ,COSCDL , STARAC ,VAC , XCC , CCC
R1590 PFF 2 LAST 957 TO 960: 121 121* CCNT* $$/P57
R1591 15,2764 71220 1 CYBOTRIM STQ CLOAD
R1592 PFF 16 LAST 955 15,2765 02745 0 GMIN
R1593 PFF 17 LAST 956 15,2766 00322 1 THETA0
R1594 15,2767 65325 0 PECL
R1595 PFF 18 LAST 961 15,2770 00324 1 THETA0 +2
R1596 PFF 19 LAST 962 15,2771 00323 0 THETA0 +1
R1597 15,2772 77666 1 VDEF
R1598 PFF 25 LAST 889 15,2773 24766 0 STOVL CDLSPCT
R1599 15,2774 24115 1 XUNIT
R1600 15,2775 77624 1 CALL
R1601 PFF 5 LAST 584 15,2776 47666 1 TRG*NRSM
R1602 PFF 26 LAST 956 15,2777 26707 0 STOVL STARAC
R1603 PFF 2 LAST 37 15,3000 24013 1 YUNIT
R1604 15,3011 77624 1 CALL
R1605 PFF 6 LAST 957 15,3002 47675 0 *NRSM*
R1606 PFF 27 LAST 960 15,3003 26715 1 STOVL STARAC +6
R1607 PFF 7 LAST 959 15,3004 47541 1 CDLTRIG
R1608 15,3005 77624 1 CALL
R1609 PFF 3 LAST 946 15,3006 20030 0 CALCSMSC
R1610 15,3007 77775 1 VLCD
R1611 PFF 7 LAST 957 15,3010 02665 0 XNB
R1612 15,3011 24007 0 STOVL 50
R1613 PFF 2 LAST 375 15,3012 02673 1 YNB
R1614 15,3013 34015 1 STOVL 120
R1615 PFF 3 LAST 944 15,3014 47443 1 AXISGEN
R1616 15,3015 77624 1 CALL
R1617 PFF 3 LAST 938 15,3016 47251 1 CALCGTA
R1618 15,3017 77775 1 JLSTTRIM EXIT
R1619 PFF 1 15,3020 3 3027 1 CA CYCOCR
R1620 PFF 291 LAST 959 15,3021 0 4616 1 TC BANKCALL
R1621 PFF 6 LAST 938 15,3022 17215 0 CACR IMPULSE

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1621	REF	252	LAST	960	15,3 23	0 4616	1	TC	PANNCALL
1622	REF	12	LAST	945	15,3 24	17713	1	CAPP	INSTALL
1623	REF	8	LAST	952	15,3 25	7 57 1	1	TC	CURTAINS
1624	REF	1			15,3 26	1 2755	0	TCF	QMINEXIT
1625	REF	12	LAST	938	15,3 27	02727	0	GYPCER	SCAPR OGC

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P1626 PFFFFCM STAR ACQUISITION AND STAR SIGHTINGS

1627	REF	192	LAST	952	15,3031	3 4755 1	2STARS	CAF	ZEPD	INITIALIZE STARIND
1628					15,3031	1 3033 0		TCF	+2	ZERO FOR 1ST STAR, ONE FOR 2ND STAR
1629	REF	45	LAST	950	15,3032	3 4753 1	1STAR	CAF	RIT1	
1630	REF	15	LAST	955	15,3033	55 757 1		TS	STARIND	
1631	REF	56	LAST	955	15,3034	0 5353 1		TC	PHASCHAG	
1632					15,3035	04024 0		CCT	04024	
1633	REF	4	LAST	953	15,3036	1 2245 1		TCF	P50	GO TO STAR ACQUIRE AND ACTMARK
1634	REF	16	LAST	962	15,3037	3 1757 0	RESR T	CA	STARIND	BACK FROM SURFACE MARKING
1635					15,3040	0 0006 1		EXTEND		
1636	REF	1			15,3041	1 2052 1		RZF	ASTAR	1ST STAR MARKED
1637	REF	07	LAST	962	15,3042	0 5353 1		TC	PHASCHMG	
1638					15,3043	04024 0		CCT	04024	
1639	REF	205	LAST	955	15,3044	0 6042 1		TC	INTPRET	
1640					15,3045	45145 0		CLDAD	CALL	
1641	REF	10	LAST	955	15,3046	02562 0			TSIGHT	TIME OF 2ND MARK
1642	REF	6	LAST	949	15,3047	32472 1			PLANET	
1643	REF	1			15,3050	37255 1		STCALL	VEC2	STORE 2ND CATALOG VEC (REF)
1644	REF	1			15,3051	33064 0			SLEFLINE	
1645	REF	206	LAST	962	15,3052	0 6042 1	ASTAR	TC	INTPRET	
1646					15,3053	77775 1		VLCAD		
1647	REF	28	LAST	96	15,3054	02715 0			STAKAD +6	
1648	REF	9	LAST	958	15,3055	02761 0		STORE	STARSAV1	1ST OBSERVED STAR (SM)
1649					15,3056	45145 0		CLCAD	CALL	
1650	REF	11	LAST	962	15,3057	03562 0			TSIGHT	TIME OF 1ST MARK
1651	REF	7	LAST	962	15,3060	32472 1			PLANET	
1652	REF	2	LAST	137	15,3061	3247 0		STORE	VEC1	STORE 1ST CATALOG VEC (REF)
1653					15,3062	77776 1		EXIT		
1654	REF	1			15,3063	1 3032 1		TCF	1STAR	GO GET 2ND STAR SIGHTING

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P1655 DO LINE OF COARSE ALIGNMENT OF INU

1656				15,3064	77131 1	SURFLINE SSP	AXT,2	
1657	REF	11	LAST	931	15,3055		S2	
1658					15,3065		6	
1659					15,3067		12D	
1660					15,3070		MXV	
1661	REF	3	LAST	962	15,3071	WPTDESIR VLOCAD*	VEC1 +120,2	PICK UP VEC IN REF, TRANS TO DESIRED SH
1662	REF	10	LAST	947	15,3072		XSMO	
1663					15,3073			
1664	REF	20	LAST	962	15,3074	UNIT	STARAD +120,2	VEC IN SM
1665					15,3075	VLOCAD*		
1666	REF	10	LAST	962	15,3076		STARSAV1 +120,2	PICK UP VEC IN PRESENT SM
1667					15,3077	STCRE	180,2	
1668					15,3100	TIIX,2	BON	
1669	REF	1			15,3101		WPTDESIR	
1670	REF	1			15,3102		INITALGN	IF INITIAL PASS (OPTION 0) BYPASS R54
1671	REF	1			15,3103		INITRY	
1672					15,3104	DOALIGN	CALL	
1673	REF	2	LAST	935	15,3105		R54	DO CHKSDATA
1674					15,3106	BOFF		
1675	REF	1	LAST	958	15,3107		FREEFLAG	
1676	REF	1			15,3110		P57POST	ASTRO DOCS NOT LIKE DATA TEST RESULTS
1677					15,3111	INITRY	CALL	
1678	REF	4	LAST	960	15,3112		AXISGCM	GET DESIRED ORIENT WRT PRES.XCC,YCC,ZCC
1679					15,3113		CALL	
1680	REF	4	LAST	960	15,3114		CALCGTA	GET CYRC TORQ ANGLES, OCC,ICC,MGC
1681					15,3115	EXIT		
1682	REF	1			15,3116	CAF	INITARIT	IF INITIAL PASS BYPASS NCLN S3 DISPLAY
1683	REF	15	LAST	955	15,3117	MASK	FLAGWRD8	
1684	REF	238	LAST	955	15,3120	CPS	A	
1685	REF	1			15,3121	TCF	5DEGTST	
1686	REF	1			15,3122	CAF	DISPGYRC	DISPLAY CYRC TORQ ANGLES V 06N93
1687	REF	253	LAST	961	15,3123	TC	HANKCALL	
1688	REF	35	LAST	958	15,3124	CACP	GCFLASH	
1689	REF	53	LAST	958	15,3125	TC	GTOPCOH	V34-TERMINATE
1690	REF	2	LAST	963	15,3126	TCF	5DEGTST	V33-PROCEED TO COARSE OR FINE
1691	REF	2	LAST	963	15,3127	TCF	P57POST +1	V32-RECYCLE, MAYBE RE-ALIGN
1692	REF	27	LAST	962	15,3130	5DEGTST	TC	INTERET
1693					15,3131		VLOCAD	IF ANGLES GREATER THAN 5 DEGS, DO COARSE
1694	REF	13	LAST	961	15,3132		RCV	
1695	REF	1			15,3133		OGC	
1696	REF	2	LAST	125	15,3134	SURFSLP	STCRE	
1697					15,3135		RCV	
1698	REF	2	LAST	920	15,3136		5DEGPRES	
1699	REF	1			15,3137		CCATPRM	
1700					15,3140	SSP	GOTO	
1701	REF	17	LAST	960	15,3141		GMIN	
1702	REF	1			15,3142		SLRFDISP	

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1703	REF	1		15,3143	33717	1		JUSTTRIM	ANGLES LESS THAN SDFG, DO GYPC TORQ
1704				15,3144	77776	1	SLRFDISP	EXIT	
1705	REF	93	LAST	962	15,3145	05353	1	TC	PHASCHNG
1706					15,3146	04024	0	CCT	04024
1707	REF	218	LAST	963	15,3147	06042	1	TC	INTPRET
1708					15,3150	75160	1	AXC,1	AXC,2
1709	REF	11	LAST	962	15,3151	02606	1		XSMO
1710	REF	49	LAST	951	15,3152	01733	1		REFSMMAT
1711					15,3153	45014	0	SFT	CALL
1712	REF	7	LAST	956	15,3154	01462	0		REFSMPLG
1713	REF	5	LAST	946	15,3155	31371	0		MATMCVF
1714					15,3156	77776	1	EXIT	
1715	REF	9	LAST	921	15,3157	11144	0	CCS	OPTICN2
1716	REF	1			15,3160	13162	0	TCF	B2F8
1717	REF	3	LAST	962	15,3161	13172	1	TCF	P57PCST +1
1718	REF	2	LAST	963	15,3162	34752	0	B2F8	CAF
1719	REF	16	LAST	962	15,3163	70114	0		INITARIT
1720	REF	289	LAST	963	15,3164	10000	0	MASK	FLAGWRD3
1721	REF	1			15,3165	13544	0	CCS	A
1722	REF	209	LAST	964	15,3166	06042	1	TCF	P57JUMP
1723					15,3167	77624	1	TC	INTPRET
1724	REF	2	LAST	785	15,3170	33471	0	CALL	
1725					15,3171	77776	1	REEMF	GO GET ATTITUDE VEC IN MF (YARSAV, XNESAV)
1726	REF	3	LAST	935	15,3172	35741	0	P57PCST	EXIT
1727	REF	294	LAST	962	15,3173	04616	1	CAF	OPT14
1728	REF	0	LAST	963	15,3174	26240	0	TC	BACKCALL
1729	REF	54	LAST	963	15,3175	16701	1	CADD	GEOPPEL
1730	REF	2	LAST	964	15,3176	13544	0	TCF	GCTCPCOH
1731	REF	44	LAST	921	15,3177	44752	1	TCF	P57JUMP
1732	REF	10	LAST	964	15,3200	61144	1	CS	BIT2
1733					15,3201	00006	1	AC	OPTICN2
1734					15,3202	13214	0	EXTEND	
1735	REF	55	LAST	964	15,3203	16001	1	PZF	+2
1736	REF	99	LAST	964	15,3204	05353	1	TCF	GCTCPCOH
1737					15,3205	04024	0	TC	PHASCHNG
1738	REF	210	LAST	964	15,3206	06042	1	CCT	04024
1739					15,3207	45175	0	TC	INTPRET
1740	REF	8	LAST	958	15,3210	02231	0	VLOAD	CALL
1741	REF	3	LAST	812	15,3211	47663	1		LSE GNB
1742					15,3212	43105	1	GSAY	
1743	REF	50	LAST	964	15,3213	01734	0	CPL*APSM	GO TO SM CCRES
1744	REF	5	LAST	925	15,3214	01462	1	VXM	SET
1745					15,3215	51515	1		ON MCCN SO SFT LLNAFLAG
1746	REF	10	LAST	925	15,3216	02023	1	REFSMMAT	G(REF) = (REFSMMAT) * (NBSM) GNB
1747					15,3217	45561	1	LUNAFIAG	
1748	REF	6	LAST	925	15,3220	75745	0	PCVL	ABVAL
1749					15,3221	47014	1	RLS	
								VXSC	STADR
								STCR	ALPHAV
								CLEAR	RTB
									ALPHAV = PLSMAG * G(REF)

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1750	FFF	3	LAST	925	15,3222	00662	1
1751	FFF	27	LAST	949	15,3223	21574	1
1752					15,3224	77624	1
1753	PFF	2	LAST	925	15,3225	31441	1
1754	FFF	15	LAST	874	15,3226	71227	1
1755					15,3227	65352	1
1756	PFF	14	LAST	953	15,3228	01242	1
1757					15,3229	77616	1
1758	FFF	23	LAST	854	15,3232	35234	1
1759	PFF	2	LAST	784	15,3233	51677	0
1760	PFF	11	LAST	964	15,3234	02022	1
1761					15,3235	77776	1
1762	FFF	56	LAST	964	15,3236	16001	1

	BEADFLAG
	LCADTIME
CALL	
	ABORTISF
STORE	RM
VSL2	PDDI
	GFT/2 +4
PUSH	
STCALL	PIPTIME
	R-TO-RP
STOPE	RLS
EXIT	
TCF	GCTOPECH

SUPRCUTINE TO CALC LS AND GIVE RLS BACK
RM=RLS P-29 = LM POSITION
R-TO-RP GETS RLS P-27 AT C-5D IN POLIST
TIME TEMP STORED IN N89DISP
TIME AT 6-7 IN POLIST
PIPTIME = LM STATE TIME
RLS IN MFCN-FIXED CCCCCS
EXIT F57

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P1763 COARSE AND FINE ALIGN IMU

1764				15,3237	75160 1	COATRIM	AXC,1	AXC,2
1765	REF	5	LAST	944	15,3240			XDC
1766	REF	22	LAST	957	15,3241			XSM
1767				15,3242	77624 1		CALL	
1768	REF	6	LAST	964	15,3242			MATMOV
1769				15,3244	77624 1		CALL	
1770	REF	8	LAST	960	15,3245			COLTRIG
1771				15,3246	77624 1		CALL	
1772	REF	4	LAST	960	15,3247			CALCSPSC
1773				15,3250	77624 1		CALL	
1774	REF	4	LAST	957	15,3251			CALCGA
1775				15,3252	77414 0		BCFF	EXIT
1776	REF	2	LAST	963	15,3252			INITALGA
1777	REF	1			15,3254			CORSIT
1778	REF	4	LAST	943	15,3255	3 5010 0	CAP	V06N22
1779	REF	295	LAST	964	15,3256	4616 1	TC	BANKCALL
1780	REF	40	LAST	963	15,3257	20477 1	CADR	GCFLASH
1781	REF	57	LAST	965	15,3260	0 6001 0	TC	GETPCCH
1782				15,3261	1 3263 1		TCF	+2
1783				15,3262	1 3255 1		TCF	-5
1784	REF	100	LAST	964	15,3263	0 5353 1	TC	PHASCHNG
1785				15,3264	04024 0		CCT	04024
1786	REF	211	LAST	964	15,3265	0 6042 1	TC	INTPRFT
1787				15,3266	77624 1		CALL	
1788	REF	5	LAST	958	15,3267	31557 1	CORSIT	
1789				15,3270	77624 1		CALL	COARSE
1790	REF	4	LAST	943	15,3271	21603 0		NCORSE
1791				15,3272	77624 1		CALL	
1792	REF	1			15,3273	32764 0		GYEOTRIM
1793				15,3274	77651 1		COTO	
1794	REF	2	LAST	962	15,3275	22144 0		SLEPDISF
1795				15,3276	1535 0		DISPGYRC VN	0652

IF INITIAL ALIGNMENT DISPLAY FINAL
GIMBAL ANGLES IF COARSE ANGLES GREATER
THAN 5 DEGREES

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P1706 LUMINAR SURFACE LRU ALIGNMENT PROGRAM

1797	RFF	256	LAST	966	15,3277	0 4616 1	P57	TC	BANKCALL	IS ISS CK - IF NOT, IMCHK WILL SEND
1798	RFF	2	LAST	943	15,3270	33335 1		CADR	IMCHK	ALARM CODE 21) AND EXIT VIA GOTDPOOF
1799	RFF	27	LAST	921	15,3201	3 6250 0		CAF	THREE	JAM REFSMAT OPTION 3 FOR INITIAL EISP.
1800	RFF	11	LAST	964	15,3232	551144 0		TS	OPTION2	
1801	RFF	46	LAST	962	15,3233	3 4753 1	P57CPT	CAF	BIT1	
1802	RFF	297	LAST	967	15,3304	0 4616 1		TC	BANKCALL	
1803	RFF	2	LAST	921	15,3235	20714 1		CADR	CCPREF4R	FLASH VI406 FOR ALIGNMENT CODE
1804	RFF	58	LAST	966	15,3306	0 601 0		TC	GCTCCCH	V34 TERMINATE
1805	RFF	1			15,3307	1 3314 1		TCF	ALIGNCPT	V33 PROCEED
1806	RFF	1			15,3310	1 3313 0		TCF	P57CPT	V32 RECYCLE
1807	RFF	131	LAST	966	15,3311	0 5353 1		TC	PHASCHNG	
1808					15,3312	0 14 1		CCT	00014	
1809	RFF	142	LAST	959	15,3313	0 5155 0		TC	INDCFJCB	
1810	RFF	12	LAST	967	15,3314	3 1144 1	ALIGNCPT	CA	OPTION2	
1811	RFF	28	LAST	967	15,3315	7 6250 1		MASK	THREE	
1812	RFF	200	LAST	964	15,3316	50 200 1		INDEX	A	
1813					15,3317	1 3321 1		TCF	+1	
1814	RFF	1			15,3320	1 3323 0		TCF	TCISP	OPTION 4 LS ORIENTATION
1815	RFF	1			15,3321	1 3374 0		TCF	PACKOPTN	OPTION 1 PREFERRED
1816	RFF	2	LAST	967	15,3322	1 3333 0		TCF	P57CPT	OPTION 2 INVALID IN P57, RECYCLE
1817	RFF	212	LAST	966	15,3323	0 6142 1		TC	INTPRET	OPTION 3 REFSMAT
1818					15,3324	75167 1		AXC,1	AXC,2	JAM REFSMAT IN XSMO LOC
1819	RFF	51	LAST	964	15,3325	0 1733 1			REFSMAT	
1820	RFF	12	LAST	964	15,3326	0 2616 1			XSMO	
1821					15,3327	77624 1		CALL		
1822	RFF	7	LAST	966	15,3330	31371 0			MATMEVF	
1823					15,3331	77650 1		GOTO		
1824	RFF	2	LAST	967	15,3332	33373 0			PACKOPTN -1	
1825	RFF	213	LAST	967	15,3333	0 6 42 1	THISP	TC	INTPRET	
1826					15,3334	77745 1		CLOAD		
1827	RFF	26	LAST	832	15,3335	03442 0			TIC	LOAD ASCENT TIME FOR DISPLAY
1828	RFF	30	LAST	958	15,3336	01045 1	P57A	STORE	DSPTFM1	
1829					15,3337	77776 1		EXIT		
1830	RFF	2	LAST	921	15,3340	3 2170 0	P57AA	CAF	V76A34*	DISPLAY TALIGN, TALIGN : DSPTFM1
1831	RFF	238	LAST	967	15,3341	0 4616 1		TC	BANKCALL	
1832	RFF	41	LAST	966	15,3342	20477 1		CADR	CCFLASH	
1833	RFF	59	LAST	967	15,3343	1 6001 1		TCF	GCTCCCH	V34-TERMINATE
1834					15,3344	1 3346 1		TCF	+2	
1835	RFF	1			15,3345	1 3240 1		TCF	P57AA	V32-RECYCLE
1836	RFF	214	LAST	967	15,3346	0 6 42 1		TC	INTPRET	
1837					15,3347	65234 1		CTB	PCDL	
1838	RFF	28	LAST	966	15,3350	21574 1			LOADTIME	PUSH CURRENT TIME AND PICK UP KEY IN
1839	RFF	31	LAST	967	15,3351	01145 1			DSPTFM1	

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1841				15,3352	65254 1	BZF	PDDL	
1841	REF	1		15,3353	33363 1		P57C	IF KEY IN TIME ZERO-TALIGN=CURRENT TIME
1842				15,3354	51025 1	TSU	RPL	NOT ZERO SC EXCHANGE PD WITH DSPTEN1
1843	REF	32	LAST	967	01045 1		DSPTEN1	
1844	REF	2	LAST	968	33363 1		P57C	
1845				15,3357	45545 1	ELCAG	STADR	IF KEYIN TIME GREATER THAN CURRENT TIME
1846	REF	37	LAST	967	74235 1	STORE	TIG	STORE IT IN TIG
1847	REF	8	LAST	925	36775 1	STCALL	TALIGN	
1848	REF	1		15,3362	32265 1		P57D	
1849				15,3362	45545 1	P57C	DLQAD	STADR
1850	REF	5	LAST	968	75002 1		STORE	TALIGN
1851	REF	40	LAST	947	34041 0	P57D	STCALL	TEFC1
1852	REF	11	LAST	928	27060 1		LEMPREF	COMPLETE DESIRED IMU ORIENTATION STORE
1853				15,3367	53575 0	VLCAD	UNIT	IN X,Y,ZSMD
1854	REF	32	LAST	947	00701 0		RATT	
1855	REF	13	LAST	967	37607 1	STCALL	XSMD	
1856	REF	2	LAST	925	17775 0		LSORIENT	
1857				15,3373	77776 1	EXIT		
1858	REF	183	LAST	962	34755 1	PACKCFT	CAF	ZERO
1859	REF	2	LAST	966	55144 0	TS	OPTICN1 +1	PACK FLAG BITS FOR OPTION DISPLAY
1860	REF	3	LAST	968	55145 1	TS	OPTICN1 +2	JAM ZERO IN ALIGNMENT OPTION
1861	REF	4	LAST	950	24737 0	CAF	REFSMBIT	INITIALIZE FLAG BIT CONFIGURATION
1862	REF	16	LAST	950	70077 0	MASK	FLAGWRD3	REFSMELG
1863	REF	291	LAST	967	10000 0	CCS	A	
1864	REF	24	LAST	953	34745 0	CAF	BIT7	SET
1865	REF	4	LAST	968	27145 1	ADS	OPTICN1 +2	CLEAR-JUST ZERO
1866	REF	1		15,3404	34753 1	CAF	ATTFLBIT	
1867	REF	13	LAST	967	70102 0	MASK	FLAGWRD6	ATTFLG
1868	REF	292	LAST	968	10000 0	CCS	A	
1869	REF	26	LAST	913	34750 1	CAF	BIT4	SET
1870	REF	5	LAST	968	27145 1	ADS	OPTICN1 +2	CLEAR-ZERO IN A
1871	REF	40	LAST	968	34750 1	CAF	BIT4	
1872	REF	6	LAST	968	55143 1	TS	OPTICN1	JAM ZERO IN OPTION1 FOR CHECK LIST
1873	REF	1		15,3413	33634 0	DSOPTN	CAF	VS05N06
1874	REF	299	LAST	967	04616 1	TC	PANKCALL	DISPLAY OPTION CODE AND FLAG BITS
1875	REF	42	LAST	967	20477 1	CADR	GCFLASH	
1876	REF	60	LAST	967	10001 1	TCF	GOTOPOOH	VB34-TERMINATE
1877				15,3417	13421 1	TCF	+2	VB3-PROCEED
1878	REF	1		15,3420	13412 0	TCF	DSOPTN	VB3-RECYCLE
1879	REF	5	LAST	968	34737 0	CAF	REFSMBIT	
1880	REF	17	LAST	968	70077 0	MASK	FLAGWRD3	
1881	REF	293	LAST	968	10000 0	CCS	A	
1882	REF	1		15,3424	13524 0	TCF	GETLMATT	SET, GC COMPUTE LM ATTITUDE
1883	REF	2	LAST	968	34753 1	CAF	ATTFLBIT	CLEAR-CHECK ATTFLAG FOR STOPPED ATTITUDE.
1884	REF	14	LAST	968	70102 0	MASK	FLAGWRD6	
1885	REF	294	LAST	968	10000 0	CCS	A	
1886	REF	1		15,3430	13530 0	TCF	BYLMATT	ALLFLG SET, CHK OPTION FOR GRAVITY COMP
1887	REF	45	LAST	964	34752 0	CAF	BIT2	SEE IF OPTION 2 OR 3

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1888 PFF 13 LAST 967 15,3432 7 1144 0
 1889 PFF 255 LAST 968 15,3433 1 000 0
 1890 PFF 2 LAST 968 15,3434 1 3530 0
 1891 PFF 35 LAST 962 15,3435 1 5557 0
 1892 PFF 35 LAST 962 15,3436 1 0001 1
 1893 PFF 2 LAST 962 15,3437 2 5006 1
 1894 PFF 310 LAST 968 15,3441 1 4615 1
 1895 PFF 42 LAST 968 15,3441 2 0477 1
 1896 PFF 61 LAST 968 15,3442 1 6001 1
 1897 PFF 2 LAST 968 15,3443 1 3413 0
 1898 PFF 2 LAST 968 15,3444 1 3413 0

MASK OPTIC2
 CCS A
 TCF BYIMATT
 TC ALARM
 CCT 701
 CAP VPM5A 9
 TC BARKCALL
 CACR CCFLAST
 TCF GCTOPCH
 TCF OSPIPTN
 TCF DSFFFTN

OPTION 2 OR 3 BUT DONT HAVE ATTITUDE
 OPTION INCONSISTANT WITH FLACS-ALARM 701

DISPLAY ALARM FOR ACTION

VB34-TERMINATE
 VB3-PROCEED *****TEMPORARY
 VB32-RECYCLE TC OPTION DISPLAY V GENCE

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P1899 TRANSFER VEC1,2 FROM MOON FIXED TO REF AND JAM BACK IN VEC1,2

1900					15,3445	41221 0	MEPFF	STQ	SETPD
1901	REF	12	LAST	947	15,3446	02746 0			QMAJ
1902					15,3447	22071 0			0
1903					15,3450	77634 0		RTB	
1904	REF	29	LAST	967	15,3451	21574 1			LCADTIME
1905	REF	12	LAST	962	15,3452	27562 0		STOVL	TSIGHT
1906	REF	4	LAST	962	15,3453	03247 0			VFC1
1907					15,3454	41525 0		PDDL	PLSH
1908	REF	13	LAST	970	15,3455	03562 0			TSIGHT
1909					15,3456	77624 1		CALL	
1910	REF	4	LAST	025	15,3457	55716 1			RF-TC-K
1911	REF	5	LAST	970	15,3460	27247 0		STOVL	VFC1
1912	REF	2	LAST	962	15,3461	03255 0			VFC2
1913					15,3462	65271 1		SETPD	PDDL
1914					15,3463	00011 0			0
1915	REF	14	LAST	970	15,3464	03562 0			TSIGHT
1916					15,3465	45016 0		PUSH	CALL
1917	REF	5	LAST	970	15,3466	55716 1			RF-TC-P
1918	REF	3	LAST	970	15,3467	27255 1		STCALL	VFC2
1919	REF	13	LAST	970	15,3470	02746 0			QMAJ

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P1921 COMPLETE LN ATTITUDE IN XCON FIXED COORDINATES USING REFSMMAT AND
 R1921 STORE IN YNBSAV AND ZNBSAV

1922					15,2471	45120	1	RIEMP	STQ	CALL	
1923	REF	14	LAST	971	15,2472	02740	1			QMAJ	
1924	REF	9	LAST	966	15,2473	47541	1			CDLTRIG	GET SIN AND COS OF CDUS
1925					15,2474	40234	0		RTR	SETPD	
1926	REF	20	LAST	970	15,2475	21574	1			LEADTIME	
1927					15,2476	00001	0			0	
1928	REF	15	LAST	970	15,2477	37562	1		STCALL	TSIGHT	
1929	REF	5	LAST	966	15,2500	20033	0			CALCSMSC	GET YNP IN SM
1930					15,2501	61375	1		VICAD	VXM	
1931	REF	4	LAST	960	15,2502	02673	1			YNP	
1932	REF	52	LAST	967	15,2503	01734	0			REFSMMAT	YNB TO REF
1933					15,2504	65256	0		UNIT	PDOL	
1934	REF	10	LAST	971	15,2505	02562	0			TSIGHT	
1935					15,2506	45006	0		PLSH	CALL	
1936	REF	3	LAST	965	15,2507	51677	0			R-TD-RP	
1937	REF	2	LAST	203	15,251	26237	0		STCUL	YNBSAV	YNB TO MF
1938	REF	4	LAST	931	15,2511	02701	0			ZAB	
1939					15,2512	53505	1		VXM	UNIT	
1940	REF	50	LAST	971	15,2513	01724	0			REFSMMAT	YNB TO REF
1941					15,2514	41525	0		PDOL	PLSH	
1942	REF	17	LAST	971	15,2515	02562	0			TSIGHT	
1943					15,2516	77624	1		CALL		
1944	REF	4	LAST	971	15,2517	51677	0			R-TD-RP	YNB TO MF
1945	REF	1			15,2520	02245	0		STORE	ZNBSAV	
1946					15,2521	77614	1		SETGC		
1947	REF	1			15,2522	03036	1			ATTFLAG	
1948	REF	15	LAST	971	15,2523	02746	0			QMAJ	

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P1946 BRANCH TO ALIGNMENT OPTION

1950	REF 215	LAST	967	15,3524	0 6142 1	GETLMATT TC	INTPRET	
1951				15,3525	77624 1	CALL		
1952	REF 3	LAST	964	15,3526	23471 0		REFEF	EC TRANSFORM TC ME IN YNESAV,ZNESAV
1953				15,3527	77776 1	EXIT		
1954	REF 66	LAST	958	15,3530	1 5514 0	BYLMATT TC	UPFLAC	SET INITIAL ALIGN FLAG
1955	REF 3	LAST	966	15,3531	00205 0	ADPRES	INITIALGN	
1956	REF 47	LAST	967	15,3532	3 4753 1	CAF	BIT1	
1957	REF 14	LAST	969	15,3533	7 1144 0	MASK	OPTICN2	SEE IF OPTICN 1 OR 3
1958	REF 296	LAST	969	15,3534	10 000 0	CCS	A	
1959	REF 2	LAST	958	15,3535	1 2561 0	TCF	GVCFEPR	OPTION 1 OR 2, GET GRAVITY
1960	REF 102	LAST	967	15,3536	0 5353 1	ATTCHK TC	PHASCHNG	
1961				15,3537	04024 0	ECT	04024	
1962	REF 3	LAST	968	15,3541	3 4753 1	CAF	ATTFLPT	NCT 1 OR 3, CHECK ATTFLAG
1963	REF 15	LAST	968	15,3541	7 0102 0	MASK	FLAGWRD6	
1964	REF 257	LAST	972	15,3542	10 000 0	CCS	A	
1965	REF 1			15,3543	1 3560 0	TCF	P57OPT	GET ALIGNMENT VECs FOR OPTION 2
1966	REF 103	LAST	972	15,3544	0 5353 1	P57JUMP TC	PHASCHNG	
1967				15,3545	04024 0	ECT	04024	
1968	REF 96	LAST	958	15,3546	0 5516 0	TC	DOWNFLAG	ATTFLG CLEAR-RESET INITIALGN FLAG
1969	REF 4	LAST	972	15,3547	00205 0	AERFS	INITIALGN	
1970	REF 29	LAST	967	15,3550	2 6250 0	CAF	THPEF	
1971	REF 15	LAST	972	15,3551	7 1144 0	MASK	OPTICN2	BRANCH ON OPTICN CODE
1972	REF 258	LAST	972	15,3552	50 000 1	INDEX	A	
1973				15,3553	1 2554 1	TCF	+1	
1974	REF 2	LAST	972	15,3554	1 3561 0	TCF	P57OPT0	OPTICN IS 0
1975	REF 1			15,3555	1 3601 1	TCF	P57OPT1	OPTICN IS 1
1976	REF 1			15,3556	1 3617 0	TCF	P57OPT2	OPTICN IS 2
1977	REF 1			15,3557	1 3621 1	TCF	P57OPT3	OPTICN IS 3

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P1978 OPTION 1, GET TWO ATTITUDE VEC

1979	REF	216	LAST	972	15,2560	0 6042 1	P57CFTG	TC	INTERPRET	
1980					15,2561	77775 1		VLOAD		
1981	REF	4	LAST	971	15,2562	02237 0			YARSAV	Y AND Z ATTITUDE WILL BE PUT IN REF
1982	REF	6	LAST	970	15,2563	27247 0		STCVL	VEC1	
1983	REF	2	LAST	971	15,2564	2245 0			ZARSAV	
1984	REF	4	LAST	970	15,2565	37255 1		STCALL	VEC2	
1985	REF	10	LAST	971	15,2566	47541 1			CDUTRIG	
1986					15,2567	77624 1		CALL		
1987	REF	6	LAST	971	15,2570	20020 0			CALCSMSC	COMPUTE SC AXIS WRT PRESENT SM
1988					15,2571	77775 1		VLOAD		
1989	REF	5	LAST	971	15,2572	02673 1			YNE	
1990	REF	11	LAST	963	15,2573	26761 0	SAME TYP	STCVL	STARSAV1	Y SC AXIS WRT PRESENT SM
1991	REF	5	LAST	971	15,2574	02701 0			ZNE	
1992	REF	8	LAST	944	15,2575	36767 1		STCALL	STARSAV2	Z SC AXIS WRT PRESENT SM
1993	REF	1			15,2576	33445 1			MEARF	TRANSECFM VEC1,2 FROM ME TO REF
1994					15,2577	77651 1		GCTC		
1995	REF	2	LAST	962	15,2578	33164 0			SLPFLINE	

P1996 OPTION 1, GET LANDING SITE AND Z-ATTITUDE VEC

1997	REF	217	LAST	973	15,2601	0 6042 1	P57OPT1	TC	INTERPRET	
1998					15,2602	53575 0		VLOAD	UNIT	
1999	REF	12	LAST	965	15,2603	02023 1			RIS	LANDING SITE VEC
2000	REF	7	LAST	972	15,2604	27247 0		STCVL	VEC1	
2001	REF	3	LAST	972	15,2605	02245 0			ZARSAV	Z ATTITUDE VEC
2002	REF	5	LAST	973	15,2606	37255 1		STCALL	VEC2	
2003	REF	11	LAST	973	15,2607	47541 1			CDUTRIG	
2004					15,2610	77624 1		CALL		
2005	REF	7	LAST	973	15,2611	20020 0			CALCSMSC	GET ZNR AXIS WRT PRES SM FOR STARSAV2
2006					15,2612	45175 0		VLOAD	CALL	
2007	REF	9	LAST	964	15,2613	02241 0			GSAR	TRANS GSAR FROM NR TO SM FOR STARSAV1
2008	REF	4	LAST	964	15,2614	47633 1			CDU#ARSH	
2009					15,2615	77650 1		GCTC		
2010	REF	1			15,2616	33573 0			SAME TYP	NEW DC SAME AS OPTION C

L P51-P53

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P2011 OPTION 2, GET TWO STAR SIGHTINGS

2012	REF	1		15,3617	1	2030	0	P57OPT2	TCF	2STARS	CO SIGHTING ON 2 STARS
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P2013 OPTION 3, GET LANDING SITE VEC AND ONE STAR SIGHTING

2014	REF	218	LAST	973	15,3621	0	6242	1	P57OPT3	TC	INTPRT	
2015					15,3621	53575	0			VLCAD	UNIT	
2016	REF	13	LAST	973	15,3622	02123	1			RLS		LANDING SITE VEC
2017	REF	8	LAST	973	15,3623	03247	0			STORE	VEC1	
2018	REF	6	LAST	973	15,3624	27255	0			STOVL	VEC2	DUMMY VEC2 FOR 2ND CATALOG STAR
2019	REF	10	LAST	973	15,3625	02231	0			GSAY		GRAVITY VEC NE
2020					15,3626	77624	1			CALL		
2021	REF	5	LAST	973	15,3627	47663	1			CDU*APSM		TRANS GSAY FROM AB TO SM FOR STARSAY1
2022	REF	12	LAST	973	15,3630	35761	1			STCALL	STARSAY1	
2023	REF	2	LAST	973	15,3631	33445	1			MEDEF		STARSAY2 IS STORED AS 2ND OBSERVED STAR
2024					15,3632	77776	1			EXIT		
2025	REF	2	LAST	962	15,3633	1	3132	1		TCF	1STAR	1STAR GET VEC2, STARSAY2, GCFS TC SUPPLINE
2026					15,3634	01206	1	VPC5A06	VA	506		

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P2027 CHECK INDEXES TO VERIFY INCL IS ON

2028	RFF	46	LAST	472	15,3635	4 1277 0	IMUCHK	CS	IMD 530	
2029	RFF	24	LAST	548	15,3636	7 4743 1		MASK	BIT9	
2030	RFF	29	LAST	572	15,3637	1 0 0 0		CCS	A	IS INCL ON
2031					15,3640	1 3644 0		TCF	+4	YES
2032	RFF	41	LAST	565	15,3641	5 5567 0		TC	ALARM	NO, SEND ALARM AND EXIT
2033					15,3642	0 0211 1		DCT	21	
2034	RFF	62	LAST	565	15,3643	0 6001 0		TC	GETDPQTH	
2035	RFF	67	LAST	572	15,3644	5 5564 0		TC	UPFLAG	
2036	RFF	5	LAST	385	15,3645	0 0117 0		ADRES	IMUSE	SET IMUSE FLAG
2037	RFF	4	LAST	535	15,3646	0 4631 1		TC	SWPRETURN	
2038					14,2775			BANK	04	
2039	RFF	2	LAST	249	04,2776			SFTLCC	ACTMARK2	
2040					04,2775			BANK		
2041	RFF	1						COLA1*	\$/P57	
2042					14,2775	77220 1	LSORIENT	STQ	VLCAD	
2043	RFF	16	LAST	571	04,2776	12746 0			CMJ	
2044	RFF	6	LAST	834	04,2777	11555 0			REFCTCSM	
2045					04,3000	47235 0		VXV	VXV	
2046	RFF	2	LAST	824	04,3001	11562 0			VREFCTCSM	
2047	RFF	14	LAST	968	04,3002	13617 0			XSMD	
2048					04,3012	77656 1		UNIT		
2049	RFF	3	LAST	947	04,3014	12422 0		STC RE	ZSMD	
2050					04,3015	53435 0		VXV	UNIT	
2051	RFF	15	LAST	975	04,3016	12607 0			XSMD	
2052	RFF	6	LAST	947	04,3017	37615 1		STCALL	YSMD	
2053	RFF	17	LAST	975	04,3018	12746 0			CMJ	

L LUNAR AND SOLAR EPHEMERIDES SUBROUTINES

USER'S PAGE NO. 1 EQ S3

R2000 NAME - LSPOS - LOCATE SUN AND MOON

DATE - 25 OCT 67

R2002 MOD NO.1

R2004 MOD BY NEVILLE

ASSEMBLY SUNDANCE

R2006 FUNCTIONAL DESCRIPTION

R2007 COMPUTES UNIT POSITION VECTOR OF THE SUN AND MOON IN THE BASIC REFERENCE SYSTEM. THE SUN VECTOR S IS
 R2008 LOCATED VIA TWO ANGLES. THE FIRST ANGLE (CELIQUITY) IS THE ANGLE BETWEEN THE EARTH EQUATOR AND THE ECLIPTIC. THE
 R2009 SECOND ANGLE IS THE LONGITUDE OF THE SUN MEASURED IN THE ECLIPTIC.
 R2010 THE POSITION VECTOR OF THE SUN IS

R2011
 R2012
 R2013
 R2014
$$S = (\cos(LCS), \cos(OBL) * \sin(LCS), \sin(OBL) * \sin(LCS)), \text{ WHERE}$$

R2015
$$LCS = LOS + LOS * T - (C * \sin(2\pi * T) / 365.24 + C * \cos(2\pi * T) / 365.24)$$

R2016
 R2017
$$LOS \text{ (RAD)} \text{ IS THE LONGITUDE OF THE SUN FOR MIDNIGHT JUNE 30TH OF THE PARTICULAR YEAR.}$$

R2018
 R2019
$$LOS \text{ (RAD/DAY)} \text{ IS THE MEAN RATE FOR THE PARTICULAR YEAR.}$$

R2020
 R2021
 R2022
$$LOS \text{ AND } LCS \text{ ARE STORED AS } LOSC \text{ AND } LCSR \text{ IN RATESP.}$$

R2023
 R2024
$$\cos(OBL) \text{ AND } \sin(OBL) \text{ ARE STORED IN THE MATRIX KCMAT.}$$

R2025
$$T, \text{ TIME MEASURED IN DAYS (24 HOURS), IS STORED IN TIMEP.}$$

R2026
$$C \text{ AND } C \text{ ARE EDGE FACTORS TO MINIMIZE THE DEVIATION. THEY ARE STORED AS ONE CONSTANT (CMCD), SINCE}$$

R2027
 R2028
$$C * \sin(x) + C * \cos(x) \text{ CAN BE WRITTEN AS } (C + C) * \sin(x + PHI), \text{ WHERE } PHI = \arctan(C / C).$$

R2033 THE MOON IS LOCATED VIA FOUR ANGLES. THE FIRST IS THE OBLIQUITY. THE SECOND IS THE MEAN LONGITUDE OF THE MOON,
 R2035 MEASURED IN THE ECLIPTIC FROM THE MEAN EQUINOX TO THE MEAN ASCENDING NODE OF THE LUNAR ORBIT, AND THEN ALONG THE
 R2037 ORBIT. THE THIRD ANGLE IS THE ANGLE BETWEEN THE ECLIPTIC AND THE LUNAR ORBIT. THE FOURTH ANGLE IS THE LONGITUDE
 R2039 OF THE NODE OF THE MOON, MEASURED IN THE LUNAR ORBIT. LET THESE ANGLES BE OBL, LCM, IM, AND LON RESPECTIVELY.

R2041 THE SIMPLIFIED POSITION VECTOR OF THE MOON IS

R2042
 R2043
$$M = (\cos(LCM), \cos(OBL) * \sin(LCM) - \sin(OBL) * \sin(IM) * \sin(LCM - LON), \sin(OBL) * \sin(LCM) + \cos(OBL) * \sin(IM) * \sin(LCM - LON))$$

R2045 WHERE

R2046
$$LCM = LCM + LCM * T - (A * \sin(2\pi * T / 27.5545) + A * \cos(2\pi * T / 27.5545) + B * \sin(2\pi * T / 32) + B * \cos(2\pi * T / 32)), \text{ AND}$$

R2048
 R2049
$$LCN = LCM + LCM$$

R2050
 R2051
 R2052
$$A, A, B \text{ AND } B \text{ ARE STORED AS AMOD AND BMOD (SEE DESCRIPTION OF CMCD, ABOVE). } \cos(OBL), \sin(OBL) * \sin(IM),$$

R2053
 R2054
$$\sin(OBL), \text{ AND } \cos(OBL) * \sin(IM) \text{ ARE STORED IN KCMAT AS } K1, K2, K3 \text{ AND } K4, \text{ RESPECTIVELY. } LCM, LCM, LON, LON$$

R2055
 R2056 ARE STORED AS LCMC, LCMF, LCMG, AND LCMR IN RATESP.
$$(O \quad R \quad) \quad R$$

R2058 THE THREE PHIS ARE STORED AS FARG, EARG, AND CARG(SUN). ALL CONSTANTS ARE UPDATED BY YEAR.

R2061 CALLING SEQUENCE

L LUNAR AND SOLAR EFFICIENTS SUBROUTINES

LSEF'S PAGE NO. 2 53 53

P2072 CALL LSPDS. RETURN IT VIA GRET.

P2063 ALARMS OR ABETS

P2064 NO

P2065 SASARLE INITIALIZATION REQUIRED

P2066 TEPHEM - TIME FROM MIDNIGHT 1 JULY PRECEDING THE LAUNCH TO THE TIME OF THE LAUNCH (WHEN THE AGC CLOCK WENT TO ZERO). TEPHEM IS IN UNITS OF CENTI-SECONDS.

P2069 TIME2 AND TIME1 ARE IN MPAC AND MPAC +1 WHEN PROGRAM IS CALLED.

P2070 CLIPCL

P2071 UNIT POSITIONAL VECTOR OF SUN IN VSUN. (SCALED P-1)

P2072 UNIT POSITIONAL VECTOR OF MOON IN VMON. (SCALED R-1)

P2073 SUBROUTINES USED

P2074 NAME

P2075 QUERIS

P2076 CURRENT CORE SET, WORK AREA AND FREEFLAG

2077					04,2011		
2077C1	REF	1			15,2000		
2077C2					15,2647		

BANK	J4
SETLOC	TEPHEM
BANK	

2078	REF	6	LAST	955	15,1714		
2078E	REF	1					
2078F	REF	2	LAST	928	15,2647		

LLNPCS

FBANK=	VSUN
COUNT*	44/TEPHEM
EQUALS	LSPDS

2079					15,2647	54211 0	LSPDS
2080					15,2650	77711 0	
2082					15,2651	27617 0	
2083					15,2652	56371 1	

SETPC	SR
	0
	140

TF

2084	REF	3	LAST	243	15,2653	01777 0	
2086	REF	1			15,2654	12724 1	
2087	REF	1			15,2655	00031 0	

TAC	00V
	TEPHEM
	CSTODAY

TIME OF LAUNCH

24 HOURS-8640000 CENTI-SECS/DAY R-32

T IN DAYS

2088					15,2656	77170 1	
2089					15,2657	00000 1	
2090					15,2660	00000 1	
2091					15,2661	77614 1	

STORE	TIMEP
EXT,1	EXT,2
	0
	0

2092	REF	11	LAST	963	15,2662	00274 0	
2093					15,2663	77745 1	PCSTIA
2094	REF	1			15,2664	12004 0	
2095	REF	1			15,2665	00027 1	

CLEAR	
	FREEFLAG
	CLCAD

SWITCH BIT

2096					15,2666	40745 0	PCSTIP
2097	REF	2	LAST	977	15,2667	00031 0	
2098	REF	1			15,2670	12051 1	

CLCAD	KCMAT +2
STORE	STMP
CLCAD	OMP*
	TIMEP
	VAL67 +4,1

ZFRCS

T

1/27 OR 1/22 OR 1/265

L LUNAR AND SOLAR PHENOMENA SUBROUTINES

USNR'S PAGE NO. 3 E5 S3

2099				15,3671	42661 0	SL	DAD*	
2100				15,3672	20211 1		BC	
2101	REF	2	LAST	977	15,3673		VAL67 +2,1	AARG
2102					15,3674		DMP*	SIN(T/27+PH1) CR T/32 CR T/365
2103	REF	2	LAST	978	15,3675		VAL67,1	(A1**2+A1**2)**1/2SIN(X+PH1A)
2104					15,3676		INCR,1	PLCS
2105	REF	2	LAST	977	15,3677		GTMP	(B0**2+B1**2)**1/2SIN(X+PHIR)
2106					15,3700		DEC	-6
2107	REF	3	LAST	978	15,3701		STCR	GTMP
2108					15,3702		PCFSET	CR (C0**2+C1**2)**1/2SIN(X+PHIC)
2109	REF	12	LAST	977	15,3703			FREEFLAG
2110	REF	1			15,3704			PCSITE
2111					15,3705	PCSITE	ELCAD	DMP*
2112	REF	3	LAST	977	15,3706			TIMEP
2113	REF	1			15,3707			PATESP,2
2114					15,3710		SL	DAD*
2115					15,3711			50
2116	REF	2	LAST	978	15,3712			PATESP +6,2
2117					15,3713		DSL	
2118	REF	4	LAST	978	15,3714			GTMP
2119	REF	1			15,3715		STCR	STMP,2
2120					15,3716		SLCAD	INCR,2
2121	REF	17	LAST	957	15,3717			X2
2122					15,3720		DEC	-2
2123					15,3721		DAD	BZF
2124	REF	1			15,3722			PCB-13
2125	REF	1			15,3723			PCSITE
2126					15,3724		BPL	
2127	REF	1			15,3725			PCSITE
2128					15,3726	PCSITE	ELCAD	DSL
2129	REF	2	LAST	978	15,3727			STMP
2130	REF	2	LAST	978	15,3730			STMP +4
2131					15,3731		SIN	PDDL
2132	REF	4	LAST	978	15,3732			STMP
2133					15,3733		SIN	PDDL
2134	REF	5	LAST	978	15,3734			STMP
2135					15,3735		CCS	VDEF
2136					15,3736		MXV	LATT
2137	REF	2	LAST	977	15,3737			KCNMAT
2138	REF	8	LAST	928	15,3740		STCR	VMCON
2139					15,3741		ELCAD	PDDL
2140	REF	3	LAST	978	15,3742			KCNMAT +2
2141	REF	6	LAST	978	15,3743			STMP +2
2142					15,3744		SIN	PDDL
2143	REF	7	LAST	978	15,3745			STMP +2
2144					15,3746		CCS	VDEF
2145					15,3747		MXV	UNIT
2146	REF	4	LAST	978	15,3750			KCNMAT
2147	REF	7	LAST	977	15,3751		STCR	VSLN
2148					15,3752		RVQ	

L LUNAR AND SOLAR EPHEMERIS SUBROUTINES

USFPA'S PAGE NO. 4 E5 S3

2149					15,3753	77745 1	POSTIE	DLCAD		
2150	REF	5	LAST	978	15,3754	12034 0			KINMAT +2	ZEROS
2151	REF	5	LAST	978	15,3755	00027 1		STORE	GTMP	
2152					15,3756	77650 1		COTC		
2153	REF	1			15,3757	33735 0			PCSITE	
2153A	REF	2	LAST	51	15,3758			SETLCC	EPHEM1	
21537					15,3472			PANK		
2153F	REF	2	LAST	51 TO	52:	52	52*	COUNT*	54/EPHEM	
216					1020		STMP	EQUALS	160	
2164					1026		GTMP	EQUALS	220	
2165					0030		TIMEP	EQUALS	240	

*** END OF LEVFE S .118 ***

L DOWN-TELEMETRY PROGRAM

USER'S PAGE NO. 1 EO 53

R0001 PROGRAM NAME- DOWN TELEMETRY PROGRAM
 R0002 MOD NO.- 0 TO COMPLETELY REWRITE THE DOWN TELEMETRY PROGRAM AND DOWNLINK ERASABLE CUMP PROGRAM FOR THE
 R0004 PURPOSE OF SAVING APPROXIMATELY 150 WORDS OF CORE STORAGE.
 R0006 THIS CHANGE REQUIRES AN ENTIRELY NEW METHOD OF SPECIFYING DOWNLINK LISTS. REFER TO DOWNLINK
 R0008 LISTS IN SECTION FOR MORE DETAILS. HOWEVER THIS CHANGE WILL NOT AFFECT THE GROUND PROCESSING
 R0010 OF DOWN TELEMETRY DATA.
 R0011 MOD BY- KILROY, SMITH, DEWITT
 R0012 DATE- 02 OCT 67
 R0013 AUTHOR- KILROY, SMITH, DEWITT, DEWOLF, FAGIN
 R0014 LOG SECTION- DOWN-TELEMETRY PROGRAM
 R0015 FUNCTIONAL DESCRIPTION- THIS ROUTINE IS INITIATED BY TELEMETRY END
 R0016 PULSE FROM THE DOWNLINK TELEMETRY CONVERTER. THIS PULSE OCCURS
 R0017 AT 50 TIMES PER SEC (EVERY 20 MS) THEREFORE EDCWNMTM IS
 R0018 EXECUTED AT THESE RATES. THIS ROUTINE SELECTS THE APPROPRIATE
 R0019 AGC DATA TO BE TRANSMITTED DOWNLINK AND LOADS IT INTO OUTPUT
 R0021 CHANNELS 34 AND 35. THE INFORMATION IS THEN GATED OUT FROM THE
 R0022 LGC IN SERIAL FASHION.
 R0023 THIS PROGRAM IS CODED FOR A 2 SECOND DOWNLIST. SINCE DOWNLISTS
 R0024 OCCUR EVERY 20MS, 2 AGC COMPUTER WORDS CAN BE PLACED IN
 R0025 CHANNELS 34 AND 35 DURING EACH DOWNRUPT THE PROGRAM IS CAPABLE
 R0026 OF SENDING 200 AGC WORDS EVERY 2 SECONDS.
 R0027 CALLING SEQUENCE- NONE
 R0028 PROGRAM IS ENTERED VIA TCF EDCWNMTM WHICH IS EXECUTED AS A
 R0029 RESULT OF A DOWNRUPT. CONTROL IS RETURNED VIA TCF RESUME WHICH
 R0030 IN EFFECT IS A RESUME.
 R0031 SUBROUTINES CALLED- NONE
 R0032 NORMAL EXIT MODE- TCF RESUME
 R0033 ALARM OR ABORT EXIT MODE- NONE
 R0034 RESTART PROTECTION:
 R0035 ON A FRESH START AND RESTART THE 'STARTSUR' SUBROUTINE WILL INITIALIZE THE DOWNLIST PCOUNTER (ACTUALLY
 R0036 DNTMPCNT) TO THE BEGINNING OF THE CURRENT DOWNLIST (I.E. CURRENT CONTENTS OF DNLSTADR). THIS HAS THE
 R0038 EFFECT OF IGNORING THE REMAINDER OF THE DOWNLIST WHICH THE DOWN-TELEMETRY PROGRAM WAS WORKING ON WHEN
 R0040 THE RESTART (OR FRESH START) OCCURRED AND RESUME DOWN TELEMETRY FROM THE BEGINNING OF THE CURRENT
 R0042 DOWNLIST.
 R0043 ALSO OF INTEREST IS THE FACT THAT ON A RESTART THE AGC WILL ZERO DOWNLINK CHANNELS 13, 34 AND 35.
 R0044 DOWNLINK LIST SELECTION:
 R0046 THE APPROPRIATE DOWNLINK LISTS ARE SELECTED BY THE FOLLOWING:
 R0047 1. FRESH START
 R0048 2. V37EXX WHERE XX = THE MAJOR MODE BEING SELECTED.
 R0049 3. UPDATE PROGRAM (P27)
 R0050 4. NFA-V37 SELECTABLE TYPE PROGRAMS (E.C. AGS INITIALIZATION (SUNDBANCE, LUMINARY) AND P61-P62
 R0051 TRANSITION (COLCSSL) ETC.).
 R0052 DOWNLINK LIST RULES AND LIMITATIONS:
 R0053 READ SECTION(S) WHICH FOLLOW 'DEBRIS' WRITEUP.
 R0054 OUTPUT- EVERY 2 SECONDS 170 CBLBLC PRECISION WORDS (I.E. 200 LGC
 R0055 COMPUTER WORDS) ARE TRANSMITTED VIA DOWNLINK.
 R0056 ERASABLE INITIALIZATION REQUIRED- NONE
 R0057 'DNTMPCNT' AND 'DNLSTADR' ARE INITIALIZED BY THE FRESH START PROGRAM.
 R0058 DEBRIS (ERASABLE LOCATIONS DESTROYED BY THIS PROGRAM)-
 R0059 LDATALST, DNTMPCNT TO DNTMPCNT + 210, TMINDEX, DNG.

GAP: ASSEMBLE REVISION 116 OF ACC PROGRAM LUMINARY BY NASA 2121112-071

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L DOWN-TELEMETRY PROGRAM

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RCC66

L DOWN-TELEMETRY PROGRAM

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R0065 DOWNLINK IS ENTERED EVERY 20 MS BY AN INTERRUPT TRIGGERED BY THE
R0066 RECEIPT OF AN IMPULSE FROM THE SPACECRAFT TELEMETRY PROGRAMMER.

R0067 NOTES REGARDING DOWNLINK LISTS ASSOCIATED WITH THIS PROGRAM:

- R0068 1. DOWNLISTS. - DOWNLISTS MUST BE COMPILED IN THE SAME BANK AS THE
R0069 DOWN-TELEMETRY PROGRAM. THIS IS DONE FOR EASE OF CODING, FASTER
R0070 EXECUTION.
- R0075 2. EACH DOWNLINK LIST CONSISTS OF A CONTROL LIST AND A NUMBER OF
R0076 SUBLISTS.
- R0077 3. A SUBLIST REFERS TO A SNAPSHOT OF DATA COMMON TO THE SAME OR OTHER
R0078 DOWNLINK LISTS. ANY SUBLIST CONTAINING COMMON DATA NEEDS TO BE
R0079 CODED ONLY ONCE FOR THE APPLICABLE DOWNLINK LISTS.
- R0080 4. SNAPSHOT SUBLISTS REFER SPECIFICALLY TO HOMOGENEOUS DATA WHICH MUST BE
R0081 SAVED IN A BUFFER DURING ONE DOWNLINK.
- R0082 5. THE 10NADR FOR THE 1ST WORD OF SNAPSHOT DATA IS FOUND AT THE END
R0083 OF EACH SNAPSHOT SUBLIST, SINCE THE PROGRAM CODING SENDS THIS DP WORD
R0084 IMMEDIATELY AFTER STOPPING THE OTHERS IN THE SNAPSHOT BUFFER.
- R0085 6. ALL LISTS ARE COMBINATIONS OF CODED ERASABLE ADDRESS CONSTANTS
R0086 CREATED FOR THE DOWNLIST PROGRAM.
- R0087 A. 10NADR 1-WORD DOWNLIST ADDRESS.
R0088 SAME AS ECADR, BUT USED WHEN THE WORD ADDRESSED IS THE LEFT
R0089 HALF OF A DOUBLE-PRECISION WORD FOR DOWN TELEMETRY.
- R0090 B. 20NADR - 60NADR N-WORD DOWNLIST ADDRESS, N = 2 - 6.
R0091 SAME AS 10NADR, BUT WITH THE 4 UNUSED BITS OF THE ECADR FORMAT
R0092 FILLED IN WITH 0011-1111. USED TO POINT TO A LIST OF N DOUBLE-
R0093 PRECISION WORDS, STORED CONSECUTIVELY, FOR DOWN TELEMETRY.
- R0094 C. 0NCHAN DOWNLIST CHANNEL ADDRESS.
R0095 SAME AS 10NADR, BUT WITH PREFIX BITS 0111. USED TO POINT TO
R0096 A PAIR OF CHANNELS FOR DOWN TELEMETRY.
- R0097 D. CNPTR DOWN TELEMETRY SUBLIST POINTER.
R0098 SAME AS GAP BUT TAGGED AS A CONSTANT. USED IN CONTROL LIST TO POINT TO A SUBLIST.
R0099 CAUTION--- A CNPTR CANNOT BE USED IN A SUBLIST.
- R0100 7. THE WORD ORDER CODE IS SET TO ZERO AT THE BEGINNING OF EACH DOWNLIST (I.E. CONTROL LIST) AND WHEN
R0101 A '10NADR TIME2' IS DETECTED IN THE CONTROL LIST(ONLY).
- R0102 8. IN THE SNAPSHOT SUBLIST ONLY, THE 0NCHAN'S CANNOT POINT TO THE FIRST WORD OF ANY BANK.

R0106 DOWNLINK LIST RESTRICTIONS:

R0107 (THE FOLLOWING POINTS MAY BE LISTED ELSEWHERE BUT ARE LISTED HERE SO IT IS CLEAR THAT THESE THINGS CANNOT BE
R0108 DONE)

- R0110 1. SNAPSHOT DOWNLIST:
R0111 (A) CANNOT CONTAIN THE FOLLOWING ECADRS(I.E. 10NADR'S): 400, 1000, 1400, 2000, 2400, 3000, 3400.
R0113 (B) CAN CONTAIN ONLY 10NADR'S
- R0114 2. ALL DOWNLINKED DATA(EXCEPT CHANNELS) IS PICKED UP BY A <DCA>SO DOWNLINK LISTS CANNOT CONTAIN THE
R0116 EQUIVALENT OF THE FOLLOWING ECADRS(I.E. 10NADR'S): 277, 777, 1377, 1777, 2377, 27777, 3377, 3777.
R0118 (NOTE: THE TERM EQUIVALENT MEANT THAT THE 10NADR TO 60NADR WILL BE PROCESSED LIKE 1 TO 6 ECADRS)
- R0120 3. CONTROL LISTS AND SUBLISTS CANNOT HAVE ENTRIES = 00101 (0000 OR 00101 77777

L DOWN-TELEMETRY PROGRAM

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R0122 4. THE 'IONADE TIME2' WHICH WILL CAUSE THE DOWNLINK PROGRAM TO SET THE WORDER CODE TO 3 MUST APPEAR IN THE
R0124 CONTROL SECTION OF THE DOWNLIST.

R0125 5. 'DACHAN' CANNOT BE USED.

R0126 6. 'DNETP D' CANNOT BE USED.

R0127 7. DNETR CANNOT APPEAR IN A SUPLIST.

R0128

R0129 FRANK SETTINGS

R0130 IN THE PROCESS OF SETTING THE FRANK (WHEN PICKING UP DOWNLINK DATA) THE DOWN TELEMETRY PROGRAM PUTS
R0132 'DACHAN' INTO BITS15-12 OF FRANK. HUGH BLAIR-SMITH WARNS US THAT BITS15-12 OF FRANK MAY BECOME
R0134 SIGNIFICANT SOMEDAY IN THE FUTURE. IF/WHEN THAT HAPPENS, THE PROGRAM SHOULD INSURE (BY MASKING ETC.)
R0136 THAT BITS15-12 OF FRANK ARE ZERO.

R0137 INITIALIZATION REQUIRED- TO INTERRUPT CURRENT LIST AND START A NEW ONE..

R0138 1. ADRES OF DOWNLINK LIST INTO DNLISTADR

R0139 2. NEGONE INTO SUPLIST

R0140 3. NEGONE INTO DNECADR

0142 22,3711 FRANK 22
0143 RFE 3 LAST 194 05,2000 SETLCC DOWNTELM
0144 05,2472 BANK

0145 RFE 17 LAST 205 0340 FRANK= DNTMPLFF

0146 RFE 1 COLNT* \$1/DPRCE
0147 RFE 5 LAST 814 05,2472 54 216 1 DDCDOWNTM TS BANKRLPT

0148 05,2473 0 0116 1 EXTEND

0149 RFE 5 LAST 814 05,2474 22 012 1 QXCH COLPT

0150 RFE 35 LAST 968 05,2475 3 4745 0 CA BIT7

0151 05,2476 0 0116 1 EXTEND

0152 RFE 17 LAST 815 05,2477 02 013 1 RAND CHAN13

0153 RFE 3 LAST 975 05,2500 10 000 0 CCS A

0154 RFE 4 LAST 285 05,2501 0 0335 1 TC DNTMCTC

0155 RFE 6 LAST 815 05,2502 1 6022 1 TC CIPSTALL

0156 RFE 26 LAST 982 05,2503 3 4745 0 CA BIT7

0157 05,2504 0 0026 1 EXTEND

0158 RFE 18 LAST 983 05,2505 05 013 0 WDR CHAN13

0159 RFE 5 LAST 982 05,2506 1 0335 1 TC DNTMCTC

0154 RFE 2 LAST 220 05,2507 3 7752 0 DNPBASE1 CA NEGONE

0155 RFE 1 05,2510 54 337 1 TS SUPLIST

0156 RFE 1 05,2511 54 336 0 TS DNECADR

0157 RFE 1 05,2512 3 3647 0 CA DNPBASE2

0158 RFE 6 LAST 982 05,2513 54 335 0 TS DNTMCTC

0159 RFE 1 05,2514 1 3520 0 TCF NEWLIST

0160 RFE 2 LAST 982 05,2515 11 336 0 DNPBASE2 CCS DNECADR

SAVE C
AT THE BEGINNING OF THE LIST THE WORD
ORDER BIT WILL BE SET BACK TO ZERO.

SET WORD ORDER BIT TO 1 ONLY IF IT
ALREADY ISN'T.
GO TO APPROPRIATE PHASE OF PROGRAM

INITIALIZE ALL CONTROL WORDS
WORDS TO MINUS ONE

SET DNTMCTC = 0 ALL SUBSEQUENT DOWNRUPTS
GO TO DNPBASE2

SENDING OF DATA IN PROGRESS

L DOWN-TELEMETRY PROGRAM

LSR'S PAGE NO. 5 EC 93

0161	REF	1		05,3516	0 2652 0	DNACDR TC	FETCH2WC	YES - THEN FETCH THE NEXT 2 SP WORDS
0162	REF	29	LAST	921	05,3517	77753 0	MINI2-1CNADR	NEGATIVE OF TIME2 1CNADR
0163					05,3521	1 3521 0	TCF	+1 (ECADR OF 2776 + 74001 = 77777)
0164	REF	2	LAST	983	05,3521	1 227 1	CCS	SUBLIST
0165	REF	1			05,3522	1 3665 0	TCF	NEXTINCL
0166					05,3523	74001 0	DNADRCR CCT	74001 CNADR COUNT AND ECADR DECREMENTS
0167	REF	1			05,3524	3 0334 0	CHKLIST CA	CTLIST
0168					05,3525	0 0016 1	EXTEND	
0169	REF	2	LAST	982	05,3526	6 3530 1	BZMF	NEWLIST
0170	REF	1			05,3527	1 3535 0	TCF	NEXTINCL
0171	REF	7	LAST	230	05,3530	50 333 1	NEWLIST INDEX	DNLSTCCD
0172	REF	1			05,3531	2 2441 1	CA	DNTABLE
0173	REF	2	LAST	984	05,3532	54 334 1	TS	CTLIST
0174	REF	8	LAST	984	05,3533	4 0333 0	CS	DNLSTCCD
0175	REF	1			05,3534	1 3754 0	TCF	SENDID +3
0177	REF	3	LAST	984	05,3535	50 334 0	NEXTINCL INDEX	CTLIST
0176					05,3536	3 0011 1	CA	()
0179	REF	301	LAST	983	05,3537	10 000 0	CCS	A
0180	REF	4	LAST	984	05,3540	24 334 0	INCR	CTLIST
0181					05,3541	1 3545 1	TCF	+4
0182	REF	5	LAST	984	05,3542	55 334 0	XCF	CTLIST
0183					05,3543	4 0001 0	CCM	
0184	REF	6	LAST	984	05,3544	56 334 0	XCF	CTLIST
0185	REF	302	LAST	984	05,3545	24 000 1	+4 INCR	A
0186	REF	3	LAST	983	05,3546	54 336 0	TS	DNACDR
0187	REF	1			05,3547	6 3517 1	AD	MINI2
0188	REF	303	LAST	984	05,3550	10 000 0	CCS	A
0189	REF	1			05,3551	1 3555 0	TCF	SETWC +1
0190					05,3552	47777 0	MINI1314 CCT	47777
0191	REF	2	LAST	984	05,3553	1 3555 0	TCF	SETWC +1
0192	REF	1			05,3554	0 3577 1	SETWC TC	WCZERO
0193	REF	4	LAST	984	05,3555	2 0336 1	+1 CA	DNACDR
0194	REF	1			05,3556	6 3552 0	+2 AD	MINI1314
0195					05,3557	0 0006 1	EXTEND	
0196	REF	2	LAST	984	05,3560	6 2652 0	BZMF	FETCH2WC
0197	REF	1			05,3561	6 7744 1	AD	MINI12
0198					05,3562	0 0106 1	EXTEND	
0199	REF	1			05,3563	6 2610 0	BZMF	DNACDR
0200					05,3564	0 0006 1	CONCHAN TC	6
0201	REF	5	LAST	984	05,3565	50 236 1	INDEX	DNACDR
0202					05,3566	44 000 1	INDEX	0 -400
0203	REF	170	LAST	954	05,3567	54 001 1	TS	L
0204					05,3570	0 0006 1	TC	6
0205	REF	6	LAST	984	05,3571	50 336 1	INDEX	DNACDR
0206					05,3572	43 777 1	INDEX	C -4001
0207	REF	7	LAST	984	05,3573	54 336 0	TS	DNACDR
0208	REF	3	LAST	983	05,3574	3 7752 0	CA	NECONE

YES - THEN FETCH THE NEXT 2 SP WORDS
 NEGATIVE OF TIME2 1CNADR
 (ECADR OF 2776 + 74001 = 77777)
 IS THE SUBLIST IN CONTROL
 YES
 CNADR COUNT AND ECADR DECREMENTS
 IT WILL BE NEGATIVE AT END OF LIST
 INITIALIZE CTLIST WITH
 STARTING ADDRESS OF NEW LIST
 SET POINTER TO PICK UP NEXT CTLIST WORD
 ON NEXT ENTRY TO PRPG. (A SHOULD NOT = 0)
 SET CTLIST TO NEGATIVE AND PLACE (CCDING)
 UNCOMPLEMENTED CNADR INTO A. (FOR LA)
 (ST IN)
 (CTLIST)
 SAVE CNADR
 TEST FOR TIME2 (NEG. OF ECADR)
 CAN'T SET WORD ORDER CODE
 MINUS BIT 13 AND 14 (CAN'T GET HERE)
 CAN'T SET WORD ORDER CODE
 GO SET WORD ORDER CODE TO ZERO.
 RELCAD A WITH THE CNADR.
 IS THIS A REGULAR CNADR?
 YES. (A MUST NEVER BE ZERO)
 NO- IS IT A POINTER (CNPTR) OF A
 CHANNEL (DACHAN)
 IT'S A POINTER. (A MUST NEVER BE ZERO)
 (EXECUTED AS EXTEND) IT'S A CHANNEL
 (EXECUTED AS READ)
 (EXECUTED AS EXTEND)
 (EXECUTED AS READ)
 SET DNACDR
 TO MINUS

L DOWN-TELEMETRY PROGRAM

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0210	RFF	8	LAST	984	05,2575	56 236 1	XCH	DNFCADF	WHILE PRESERVING A.	
0210	RFF	1			05,2576	1 3700 1	TCF	DNTMEXIT	GO SEND CHANNELS	
0211					05,2577	0 0000 1	WZERE	EXTEND		
02111	RFF	1			05,2600	22 0200 1	EXCH	C13QSAV		
021115	RFF	44	LAST	987	05,2601	22 070	EXCH	RFTTRFC1		
02112	RFF	7	LAST	983	05,2602	0 6022 1	TC	C13STALL		
021125	RFF	45	LAST	985	05,2603	22 070 0	EXCH	RFTTRFC1		
02113	RFF	37	LAST	982	05,2604	4 4745 1	CS	PIT7		
0212					05,2605	0 0000 1	EXTEND			
0212	RFF	14	LAST	983	05,2606	13 013 1	WAND	CHAN13	SET WORD ORDER CODE TO ZERO	
0214	RFF	2	LAST	985	05,2607	1 1265 1	TC	C13QSAV		
0215	RFF	9	LAST	985	05,2610	54 336 1	DDNPT	INDEX	DNFCADP	
0216					05,2611	2 0000 1			DNFCADP CONTAINS ADDRESS OF SUPLIST	
0217	RFF	204	LAST	984	05,2612	10 0000 1	CCS	A	CLEAR AND ADD LIST ENTRY INTO A.	
0218	RFF	14	LAST	985	05,2613	3 0336 1	CA	DNFCADP	IS THIS A SNAPSHOT SUPLIST	
0219	RFF	1			05,2614	1 3664 1	TCF	DCSUPLST	NO, IT IS A REGULAR SUPLIST.	
									A MUST NOT BE ZERO.	
0220	RFF	11	LAST	985	05,2615	56 236 1	XCH	DNFCADP	YES, IT IS A SNAPSHOT SUPLIST.	
0221	RFF	3	LAST	984	05,2616	54 337 1	TS	SUPLIST	C(DNFCADP) INTO SUPLIST	
0222	RFF	184	LAST	968	05,2617	2 4755 1	CAF	ZERO	A INTO A	
0223	RFF	3	LAST	98	05,2620	56 236 1	XCH	TMINDEX	(NOTE.. TMINDEX = DNFCADP)	
R0224	THE FOLLOWING CODING (FROM SNAPLOOP TO SNAPEND) IS FOR THE PURPOSE OF TAKING A SNAPSHOT OF 12 DP REGISTERS.									
R0226	THIS IS DONE BY SAVING 11 DP REGISTERS IN DNTMBUFF AND SAVING THE FIRST OF WORD IMMEDIATELY.									
R0228	THE SNAPSHOT PROCESSING IS THE MOST TIME CONSUMING AND THEREFORE THE CODING AND LIST STRUCTURE WERE DESIGNED									
R0230	TO MINIMIZE TIME. THE TIME OPTIMIZATION RESULTS IN RULES UNIQUE TO THE SNAPSHOT PORTION OF THE DOWNLIST.									
R0232	THESE RULES ARE.....									
R0233	1. ONLY DNFCADP'S CAN APPEAR IN THE SNAPSHOT SUPLIST									
R0234	2. THE DNFCADP'S CANNOT REFER TO THE FIRST LOCATION IN ANY BANK.									
0236	RFF	55	LAST	951	05,2621	54 073 0	SNAPLOOP	TS	EBANK	SET EBANK
0237	RFF	5	LAST	788	05,2622	7 4357 0		MASK	LOW8	ISOLATE RELATIVE ADDRESS
0238					05,2623	0 0000 1		EXTEND		
0239	RFF	305	LAST	985	05,2624	5 0000 1		INDEX	A	
0240					05,2625	3 1400 1		EBANK=	1401	
0241					05,2626	3 1402 0		DOA	1401	PICK UP 2 SNAPSHOT WORDS.
0242	RFF	18	LAST	982	05,2627	24 0000 1		EBANK=	DNTMBUFF	
0243	RFF	14	LAST	985	05,2628	5 236 1		INDEX	TMINDEX	
0244	RFF	19	LAST	985	05,2629	52 341 0	EXCH	DNTMBUFF		STORE 2 SNAPSHOT WORDS IN ELFFER
0245	RFF	5	LAST	985	05,2630	24 336 1	INCR	TMINDEX		SET BUFFER INDEX FOR NEXT 2 WORDS.
0246	RFF	6	LAST	985	05,2631	24 336 1	INCR	TMINDEX		
0247	RFF	4	LAST	985	05,2632	24 337 0	SNAPEND	INCR	SUPLIST	SET POINTER TO NEXT 2 WORDS OF SNAPSHOT
0248	RFF	5	LAST	985	05,2633	50 337 0		INDEX	SUPLIST	
0249					05,2634	0 0000 1				= CA SSSS (SSSS = NEXT ENTRY IN SUPLIST)
0250	RFF	316	LAST	985	05,2635	10 0000 1	CCS	A		TEST FOR LAST TWO WORDS OF SNAPSHOT.

L DOWN-TELEMETRY PROGRAM

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0251	REF	1		05,3636	1 3621 0	TCF	SNAPLOOP	ACT LAST TWO.
0252	REF	1		05,3637	03515 0	LCNPHAS2	GENADR	
0253	REF	6	LAST	985	05,3640	54 337 1	TS	SNAPLOOP
0254	REF	4	LAST	984	05,3641	3 7752 0	CA	NEGONE
0255	REF	12	LAST	985	05,3642	54 336 0	TS	DNACADR
0256	REF	7	LAST	986	05,3643	56 337 0	XCH	SUBLIST
0257	REF	56	LAST	985	05,3644	54 003 0	TS	FRANK
0258	REF	6	LAST	985	05,3645	7 4257 0	MASK	LCW8
0259					05,3646	0 0006 1	EXTEND	
0260	REF	307	LAST	985	05,3647	5 0000 1	INDEX	A
0261					03,1401		FRANK=	1401
0262					05,3650	3 1402 0	CCA	1401
0263	REF	20	LAST	985	05,3650		EBANK=	DNTMBUFF
0264	REF	2	LAST	985	05,3651	1 3700 1	SNAPEND	TCF
								DNTMEXIT
0265	REF	13	LAST	986	05,3652	3 0336 1	FETCH2WD	CA
0266	REF	57	LAST	986	05,3653	54 002 0	TS	DNACADR
0267	REF	7	LAST	986	05,3654	7 4357 0	TS	FRANK
0268	REF	171	LAST	984	05,3655	54 001 1	MASK	LCW8
0269	REF	1			05,3656	3 3523 0	TS	L
0270	REF	14	LAST	986	05,3657	26 336 0	CA	DNADRECR
0271					05,3660	0 0006 1	ADS	DNFCADR
0272	REF	172	LAST	986	05,3661	5 0001 0	EXTEND	
0273					03,1400		INDEX	L
0274					05,3662	3 1401 0	EBANK=	1400
0275	REF	21	LAST	986	05,3662		CCA	1400
0276	REF	3	LAST	986	05,3662	1 3700 1	EBANK=	DNTMBUFF
							TCF	DNTMEXIT
0277	REF	8	LAST	986	05,3664	54 337 1	ONSUBLIST	TS
0278	REF	9	LAST	986	05,3665	50 337 0	TS	SUBLIST
0279					05,3666	0 0000 1	INDEX	SUBLIST
0280	REF	308	LAST	986	05,3667	10 000 0	C	0
0281	REF	10	LAST	986	05,3670	24 337 0	CCS	A
0282					05,3671	1 3675 1	INCR	SUBLIST
0283	REF	11	LAST	986	05,3672	54 337 1	TCF	+4
0284	REF	5	LAST	986	05,3673	3 7752 0	TS	SUBLIST
0285	REF	12	LAST	986	05,3674	56 337 0	CA	NEGONE
0286	REF	309	LAST	986	05,3675	24 000 1	XCH	SUBLIST
0287	REF	15	LAST	986	05,3676	54 336 0	INCR	A
0288	REF	3	LAST	984	05,3677	1 3556 0	TS	DNFCADR
							TCF	SETWC +2
A0289								
A0290								
0291					05,3700	0 0006 1	DNTMEXIT	EXTEND
0292	REF	1			05,3701	01 034 1	WRITE	DNTM1
0293	REF	173	LAST	986	05,3702	3 0001 0	CA	L
0294					05,3703	0 0006 1	TMEXITL	EXTEND
0295	REF	1			05,3704	01 035 0	WRITE	DNTM2
0296	REF	21	LAST	816	05,3705	1 5270 0	TMRESUME	TCF
								RESUME

PICK UP FIRST 2 WORDS OF SNAPSHOOT.

NOW CC SEND THEM.

SET EBANK

ISOLATE RELATIVE ADDRESS

DECREMENT COUNT AND ECADR

PICK UP 2 DATA WORDS

NOW CC SEND THEM.

SET SUBLIST PCINTER

= CA SSSS (SSSS = NEXT ENTRY IN SUBLIST)

IS IT THE END OF THE SUBLIST

NO-

SAVE A.

SET SUBLIST TO MINUS

RETRIEVE A.

SAVE DNADR

GO USE COMMON CODING (PROBLEMS WOULD OCCUR IF THE PROGRAM ENCOUNTERED A DNADR NOW)

DOWN-TELEMETRY EXIT

TO SEND A + L TO CHANNELS 34 + 35 RESPECTIVELY

EXIT TELEMETRY PROGRAM VIA RESUME.

I DOWN-TELEMETRY PROGRAM

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0297	REF	2	LAST	537	7744	MINP12	EQUALS	-1/8
0298	REF	7	LAST	985	1236	DNFCAEP	EQUALS	TMINEX
0299	REF	2	LAST	99	1334	CTLIST	EQUALS	LCATALST
0300	REF	2	LAST	100	1337	SUPLIST	EQUALS	CAC

03015 YCP BY - REMOVED - JUNE 1969 - ELIMINATE FRASABLE DUMP COUNT

L DOWN-TELEMETRY PROGRAM

USER'S PAGE NO. 9 EQ S3

R0301 SUPPLIANT NAME- ENDUMP
 R0302 FUNCTIONAL DESCRIPTION - (1) SEND (DUMP) ALL 8 BANKS OF ERASABLE STORAGE TWICE. BANKS ARE SENT ONE AT A TIME
 R0304 EACH BANK IS PRECEDED BY AN ID WORD, SYNCH BITS, ECADR AND TIME1 FOLLOWED BY THE 256C WORDS OF EACH
 R0306 FRANK. FRANKS ARE DUMPED IN ORDER (I.E. EBANK 0 FIRST, THEN EBANK1 ETC.)
 R0308 CALLING SEQUENCE- THE GROUND OR ASTRONAUT BY KEYING V74F CAN INITIALIZE THE DUMP.
 R0310 AFTER KEYING TO V74F THE CURRENT DOWNLIST WILL BE IMMEDIATELY TERMINATED AND THE DOWNLINK ERASABLE DUMP
 R0312 WILL BEGIN.
 R0313 ONCE INITIATED THE DOWNLINK ERASABLE DUMP CAN BE TERMINATED (AND INTERRUPTED DOWNLIST REINSTATED) ONLY
 R0315 BY THE FOLLOWING:
 R0316 1. A FRESH START
 R0317 2. COMPLETION OF BOTH COMPLETE DUMPS
 R0320 3. AND INVOLUNTARILY BY A RESTART.
 R0321 NORMAL EXIT MODE- TO DPHASE1
 R0322 ALARM OR ABORT MODE- NONE
 R0323 *SUBROUTINES CALLED- NONE
 R0324 ERASABLE INITIALIZATION REQUIRED-
 R0325 NONE
 R0328 DERRIS- DUMPLCC, DUMPSW, DNTGCTC, FRANK AND CENTRAL REGISTERS
 R0329 TIMING- $\text{TIME (IN SECS)} = ((\text{NC.DUMPS}) * (\text{NO.EBANKS}) * (\text{WDSPEREBANK} + \text{NC.IDWDS})) / \text{NC.WDSPERSEC}$
 R0331 $\text{TIME (IN SECS)} = (4) * (8) * (256 + 4) / 100$
 R0333 THUS TIME (IN SECS TO SEND DUMP OF ERASABLE 4 TIMES VIA DOWNLINK) = 83.2 SECONDS

R0335 STRUCTURE OF ONE FRANK AS IT IS SENT BY DOWNLINK PROGRAM-
 R0336 (REMINDR-THIS ONLY DESCRIBES ONE OF THE 8 FRANKS X 4 (DUMPS) = 32 FRANKS WHICH WILL BE SENT BY DNDLMP)

DOWNLIST	WORD	TAKEN FROM CONTENTS OF	EXAMPLE 0	COMMENTS
R0340	1	FRASID	0177X	0 DOWNLIST I.D. FOR DOWNLINK ERASABLE DUMP (X=7 CSM, 6 LM)
R0342	2	LCWIDCOR	77340	1 DOWNLINK SYNCH BITS. (SAME ONE USED IN ALL OTHER DOWNLISTS)
R0344	3	DUMPLCC	13400	1 (SEE NOTES ON DUMPLCC) 1= 3RD ERAS DUMP, 3400=ECADR OF 5TH WD
R0346	4	TIME1	14120	1 TIME IN CENTISECONDS
R0347	5	FIRST WORD OF FRANK X	03400	1 IN THIS EXAMPLE THIS WORD = CONTENTS OF E7,1400 (ECADR 3400)
R0349	6	2ND WORD OF FRANK X	00142	1 IN THIS EXAMPLE THIS WORD = CONTENTS OF E7,1401 (ECADR 3401)
R0351	7	3RD WORD OF FRANK X	00142	1 IN THIS EXAMPLE THIS WORD = CONTENTS OF E7,1402 (ECADR 3402)
R0353	.		1	
R0354	.		1	
R0355	.		1	
R0356	260D	256TH WORD OF FRANK X	03777	1 IN THIS EXAMPLE THIS WORD = CONTENTS OF E7,1777 (ECADR 3777)

R0358 NOT - DUMPLCC CONTAINS THE COUNTER AND ECADR FOR EACH WORD BEING SENT.

R0359 THE BIT STRUCTURE OF DUMPLCC IS FOLLOWS---

R0360 X = NOT USED
 R0361 X ABC FEE RRRRRR ABC = ERASABLE DUMP COUNTER (I.E. ABC = 0,1,2 OR 3 WHICH MEANS THAT
 R0363 COMPLETE ERASABLE DUMP NUMBER 1,2,3 OR 4 RESPECTIVELY IS IN PROGRESS)
 R0365 FEE = EBANK BITS
 R0366 RRRRRR = RELATIVE ADDRESS WITHIN AN FRANK.

R0368	REF 185	LAST 585	05,3756	3 4755	1	ENDUMPI	CA	ZERC	INITIALIZE DOWNLINK
R0369	REF 1		05,3717	54 336	0		TS	DUMPLCC	ERASABLE DUMP
R0370	REF 2	LAST 984	05,3710	0 3751	1	+2	TC	SENDID	CO SEND ID AND SYNCH BITS

L DOWN-TELEMETRY PROGRAM

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0371	REF	1		05,3711	3 3720 1	CA	LDNDUMP1	SET DNTAGOTC
0372	REF	7	LAST	05,3712	54 335 0	TS	DNTAGOTO	TO LOCATION FOR NEXT PASS
0373	REF	16	LAST	05,3713	3 0025 0	CA	TIME1	PLACE TIME1
0374	REF	174	LAST	05,3714	56 001 0	XCH	L	INTC L
0375	REF	2	LAST	05,3715	3 0336 1	CA	DUMPLCC	AND ECADR OF THIS ERANK INTO A
0376	REF	4	LAST	05,3716	1 3700 1	TCF	DNTMEXIT	SEND DUMPLCC AND TIME1
0377	REF	1		05,3717	03721 0	LDNDUMP	ADRES	DNDUMP
0378	REF	1		05,3720	03733 0	LDNDUMP1	ADRES	DNDUMP1
0379	REF	64	LAST	05,3721	3 4752 0	DNDUMP	CA	TWO
0380	REF	3	LAST	05,3722	26 336 0	ACS	DUMPLCC	INCREMENT ECADR IN DUMPLCC
0381	REF	9	LAST	05,3723	7 4357 0	MASK	LOWR	TO NEXT DP WORD TO BE
0382	REF	310	LAST	05,3724	10 100 0	CCS	A	DUMPLCC AND SAVE IT.
0383	REF	1		05,3725	1 3735 1	TCF	DNDUMP2	IS THIS THE BEGINNING OF A NEW ERANK
0384	REF	4	LAST	05,3726	3 0336 1	CA	DUMPLCC	NO- THEN CONTINUE DUMPING
0385	REF	33	LAST	05,3727	7 4737 1	MASK	BIT13	YES- IS THIS THE END OF THE
0386	REF	2	LAST	05,3730	0 0006 1	EXTEND		SECOND COMPLETE ERASABLE DUMP?
0387	REF	2	LAST	05,3731	1 3710 0	RZF	DNDUMP1 +2	NO - GO BACK AND INITIALIZE NEXT BANK
0390	REF	2	LAST	05,3732	1 3527 1	TCF	DMPHASE1	YES - SEND DOWNLIST AGAIN
0391	REF	1		05,3733	3 3717 0	DNDUMP1	CA	SET DNTAGOTC
0392	REF	8	LAST	05,3734	54 335 0	TS	DNTAGOTC	FOR WORDS 3 TO 2560 OF CURRENT ERANK
0393	REF	5	LAST	05,3735	3 0336 1	DNDUMP2	CA	DUMPLCC
0394	REF	58	LAST	05,3736	54 002 0	TS	ERANK	SET ERANK
0395	REF	9	LAST	05,3747	7 4357 0	MASK	LOWR	ISOLATE RELATIVE ADDRESS.
0396	REF	233	LAST	05,3740	54 002 1	TS	Q	(NOTE: MASK INSTRUCTION IS USED TO PICK
0397	REF	23	LAST	05,3741	3 4754 0	CA	NEG1	UP ERASABLE REGISTERS SO THAT EDITING
0398	REF	175	LAST	05,3742	54 001 1	TS	L	REGISTERS 20-23 WILL NOT BE ALTERED.)
0399	REF	234	LAST	05,3743	50 002 0	INDEX	Q	
0400				03,1400		FRANK=	1400	PICK UP LOW ORDER REGISTER OF PAIR
0401				05,3744	7 1401 1	MASK	1401	OF ERASABLE REGISTERS.
0402	REF	176	LAST	05,3745	56 001 0	XCH	L	
0403	REF	235	LAST	05,3746	50 002 0	INDEX	Q	PICK UP HIGH ORDER REGISTER OF PAIR
0404				05,3747	7 1402 0	MASK	1402	OF ERASABLE REGISTERS.
0405	REF	22	LAST	05,3748	3 3700 1	ERANK=	DNTMEXIT	
0406	REF	5	LAST	05,3750	1 3700 1	TCF	DNTMEXIT	GO SEND THEM
0407				05,3751	0 0006 1	SENDIC	EXTEND	**ENTRANCE USED BY ERASABLE DUMP PROC.**
0408	REF	9	LAST	05,3752	22 335 1	QXCH	DNTAGOTO	SET DNTAGOTC SO NEXT TIME PROC WILL GO
0409	REF	1		05,3753	3 5011 1	CAF	FRANKIC	TO LOCATION FOLLOWING :TO SENDIC:
0410	REF	177	LAST	05,3754	54 001 1	TS	L	**ENTRANCE USED BY REGULAR DOWNLINK PROC**
0411	REF	2	LAST	05,3755	1 3577 1	TC	W0ZERN	GO SET WORD ORDER CODE TO ZERO
0412	REF	1		05,3756	3 2065 0	CAF	LOWIDCODE	PLACE SPECIAL ID CODE INTO L
0413	REF	178	LAST	05,3757	56 001 0	XCH	L	AND ID PACK INTO A
0414	REF	6	LAST	05,3758	1 3700 1	TCF	DNTMEXIT	SEND DOWNLIST ID CODE(S).

L INTER-BANK COMMUNICATION

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R0011 THE FOLLOWING ROUTINE CAN BE USED TO CALL A SUBROUTINE IN ANOTHER BANK. IN THE BANKCALL VERSION, THE
 R0003 CADDR OF THE SUBROUTINE IMMEDIATELY FOLLOWS THE TC BANKCALL INSTRUCTION, WITH C(A) AND C(L) PRESERVED.

0015				4616		BLOCK	2		
00055	REF	1				COUNT	11/BANK		
0016	REF	6	LAST	492	4616	52	134	1	BANKCALL
0017	REF	236	LAST	990	4617	50	132	0	INDEX
0008					4620	3	0100	1	CA
0009	REF	237	LAST	990	4621	24	002	0	INCR

SAVE INCOMING A,L.
 PICK UP CADDR.
 SO WE RETURN TO THE LOC. AFTER THE CADDR.

R0010 SWCALL IS IDENTICAL TO BANKCALL, EXCEPT THAT THE CADDR ARRIVES IN A.

0012	REF	179	LAST	990	4622	54	011	1	SWCALL	TS	1
0013	REF	4	LAST	564	4623	22	014	0	LXCH	FRANK	
0014	REF	8	LAST	744	4624	7	5012	0	MASK	LCW10	
0015	REF	238	LAST	990	4625	56	002	0	XCH	Q	
0016	REF	7	LAST	990	4626	52	134	0	CXCH	BLF2	
0017	REF	239	LAST	990	4627	50	132	0	INDEX	Q	
0018					4630	0	2000	0	TC	10000	

SWITCH BANKS, SAVING RETURN.
 GET SUB-ADDRESS OF CADDR.
 A,L NOW CONTAINS CP RETURN.
 RESTORING INPUTS IF THIS IS A BANKCALL.
 SETTING C TO SWRETURN.

0019	REF	8	LAST	990	4631	56	134	1	SWRETURN	XCH	BLF2 +1
0020	REF	5	LAST	990	4632	56	004	0	XCH	FRANK	
0021	REF	9	LAST	990	4633	56	134	1	XCH	BLF2 +1	
0022	REF	10	LAST	990	4634	0	0133	0	TC	BLF2	

COMES HERE TO RETURN TO CALLER. C(A,L)
 ARE PRESERVED FOR RETURN.

R0023 THE FOLLOWING ROUTINE CAN BE USED AS A UNILATERAL JUMP WITH C(A,L) PRESERVED AND THE CADDR IMMEDIATELY
 R0025 FOLLOWING THE TC POSTJUMP INSTRUCTION.

0026	REF	240	LAST	990	4635	56	002	0	PCSTJUMP	XCH	Q
0027	REF	311	LAST	990	4636	50	130	1	INDEX	A	
0028					4637	3	0100	1	CA	Q	

SAVE INCOMING C(A).
 GET CADDR.

R0029 BANKJUMP IS THE SAME AS POSTJUMP, EXCEPT THAT THE CADDR ARRIVES IN A.

0031	REF	6	LAST	990	4640	54	014	1	BANKJUMP	TS	FRANK
0032	REF	9	LAST	990	4641	7	5012	0	MASK	LCW10	
0033	REF	241	LAST	990	4642	56	002	0	XCH	Q	
0034	REF	242	LAST	990	4643	50	132	0	Q+10000	INDEX	Q
0035					4644	1	2000	1	PRI012	TCF	10000

RESTORING INPUT C(A) IF THIS WAS A
 POSTJUMP.
 PRI012 = TCF 10000 = 12000

L INTER-BANK COMMUNICATION

LSEF'S PAGE NO. 2 EQ S3

P0036 THE FOLLOWING ROUTINE GETS THE RETURN ADDR SAVED BY SWCALL OR BANKCALL AND LEAVES IT IN A.

0038	REF	10	LAST	990	4645	3 5 12 1	MAKECADR	CAF	LCW1	
0039	REF	11	LAST	991	4646	7 1133 1		MASK	BLF2	
0040	REF	12	LAST	991	4647	6 1134 1		AD	BLF2 +1	
0041	REF	243	LAST	990	4650	0 00 2 0		TC	Q	
00465	REF	5	LAST	878	4651	54 135 1	SUPDCAL	TS	MTEMP	
0047	REF	7	LAST	990	4652	56 004 0		XCH	FRANK	SET FRANK FOR DATA.
00475					4653	0 1006 1		EXTEND		
0048	REF	11	LAST	557	4654	04 007 1		RCP	SUPFRANK	SAVE FRANK IN BITS 15-11, AND
00495	REF	6	LAST	991	4655	56 135 0		XCH	MTEMP	SUPFRANK IN BITS 7-5.
0049	REF	11	LAST	991	4656	7 5112 0		MASK	LCW10	
00495	REF	180	LAST	990	4657	56 001 0		XCH	L	SAVE REL. ACP. IN BANK, FETCH SUPERBITS.
0051					4661	0 1004 0		INHINT		BECAUSE RUPRT DOES NOT SAVE SUPERBANK.
00515					4661	0 1006 1		EXTEND		
0051	REF	12	LAST	991	4662	01 007 1		WRITE	SUPFRANK	SET SUPERFRANK FOR DATA.
0052	REF	181	LAST	991	4663	50 001 0		INDEX	L	
00525					4664	3 2001 0		CA	10000	PINBALL (FIX MEM DISP) PREVENTS DCA HERE
0053	REF	7	LAST	991	4665	56 135 0		XCH	MTEMP	SAVE 1ST WD, FETCH OLD FRANK AND SBANK.
00534					4666	0 1006 1		EXTEND		
00535	REF	12	LAST	991	4667	01 007 1		WRITE	SUPFRANK	RESTORE SUPERBANK.
0054					4671	0 1003 1		RELINT		
00545	REF	8	LAST	991	4671	54 004 1		TS	FRANK	RESTORE FRANK.
0055	REF	8	LAST	991	4672	3 135 0		CA	MTEMP	RECOVER FIRST WORD OF DATA.
00555					4673	0 0002 0		RETURN		24 WDS. FATACALL 516 MU, SUPDCAL 422 MU

L INTER-BANK COMMUNICATION

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P0056 THE FOLLOWING ROUTINES ARE IDENTICAL TO BANKCALL AND SWCALL EXCEPT THAT THEY ARE USED IN INTERRUPT.

0058	RFF	9	LAST	900	4674	52	073	1	BANKCALL	EXCF	RUPTREG3	USES RPTREG3,4 FOR DP RETURN ADDRESS.
0059	RFF	244	LAST	991	4675	52	073	0		INDEX	Q	
0060					4676	3	073	1		CAF	Q	
0061	RFF	249	LAST	992	4677	24	072	0		INCR	Q	
0062	RFF	182	LAST	991	4701	54	071	1	ISWCALL	TS	L	
0063	RFF	9	LAST	991	4701	22	074	0		LXCF	FBANK	
0064	RFF	12	LAST	991	4702	7	072	0		MASK	LCW10	
0065	RFF	246	LAST	992	4703	56	072	0		XCH	Q	
0066	RFF	10	LAST	992	4704	52	073	1		EXCF	RUPTREG3	
0067	RFF	247	LAST	992	4705	52	072	0		INDEX	Q	
0068					4706	0	070	0		TC	10000	
0069	RFF	3	LAST	99	4707	56	073	0	ISWRTRN	XCF	RUPTREG4	
0070	RFF	10	LAST	992	4710	56	074	0		XCF	FBANK	
0071	RFF	4	LAST	992	4711	56	073	0		XCF	RUPTREG4	
0072	RFF	11	LAST	992	4712	0	072	1		TC	RUPTREG3	

P0090 2. USPRADR ACCESSES INTERPRETIVE CODING IN OTHER THAN THE USER'S FBANK. THE CALLING SEQUENCE IS AS FOLLOWS:

A0092					L	TC	USPRADR					
A0093					L+1	CAF	INTPRTX	INTPRTX IS THE INTERPRETIVE CODING				
A0094								RETURN IS TO L+2				
0103	RFF	5	LAST	460	4712	54	164	0	USPRADR	TS	LCC	SAVE A
0104	RFF	34	LAST	948	4714	3	4744	1		CA	BIT8	
0105	RFF	7	LAST	458	4715	54	023	1		TS	EDCP	EXIT INSTRUCTION TO EDCP
0106	RFF	23	LAST	820	4716	3	070	1		CA	BEANK	
0107	RFF	1			4717	54	165	1		TS	BANKSET	USER'S FBANK TO BANKSET
0108	RFF	248	LAST	992	4720	56	072	0		INDEX	Q	
0109					4721	3	070	1		CA	Q	
0110	RFF	11	LAST	992	4722	54	074	1		TS	FBANK	INTERPRETIVE BANK TO FBANK
0111	RFF	13	LAST	992	4723	7	072	0		MASK	LCW10	YIELDS INTERPRETIVE RELATIVE ADDRESS
0112	RFF	249	LAST	992	4724	56	072	0		XCH	Q	INTERPRETIVE ADDRESS TO Q, FETCHING L+1
0113	RFF	6	LAST	992	4725	56	164	1		XCF	LCC	L+1 TO LCC, RETRIEVING ORIGINAL A
0114	RFF	1			4726	1	4643	0		TCF	Q+10000	

L INTER-BANK COMMUNICATION

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P0117 THERE ARE FOL POSSIBLE SETTINGS FOR CHANNEL 07. (CHANNEL 07 CONTAINS THE SUPERBANK SETTING.)

P0119 PSEUDO-FIXED OCTAL PSEUDO

P0120 SUPERBANK SETTING S-REG. VALUE BANK NUMBERS ADDRESSES

P0121 -----

P0122	SUPERBANK	SETTING	S-REG. VALUE	BANK NUMBERS	ADDRESSES	
P0122	SUPERBANK 3	XX	2000 - 3777	20 - 37	70000 - 107777	(WHERE XX CAN BE ANYTHING AND WILL USUALLY BE SEEN AS 11)

P0124	SUPERBANK 4	100	2000 - 3777	40 - 47	110000 - 127777	(AS FAR AS IT CAN BE SEEN, ONLY BANKS 40-43 WILL EVER BE AND ARE PRESENTLY AVAILABLE)
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P0128	SUPERBANK 5	101	2000 - 3777	50 - 57	130000 - 147777	(PRESENTLY NOT AVAILABLE TO THE USER)
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P0130	SUPERBANK 6	110	2000 - 3777	60 - 67	150000 - 167777	(PRESENTLY NOT AVAILABLE TO THE USER)
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P0132	SUPERBANK 7	111	2000 - 3777	70 - 77	170000 - 187777	(PRESENTLY NOT AVAILABLE TO THE USER)
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P0134	SUPERBANK 8	112	2000 - 3777	80 - 87	190000 - 207777	(PRESENTLY NOT AVAILABLE TO THE USER)
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P0136	SUPERBANK 9	113	2000 - 3777	90 - 97	210000 - 227777	(PRESENTLY NOT AVAILABLE TO THE USER)
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P0138	SUPERBANK 10	114	2000 - 3777	100 - 107	230000 - 247777	(PRESENTLY NOT AVAILABLE TO THE USER)
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P0142	SUPERBANK 11	115	2000 - 3777	110 - 117	250000 - 267777	(PRESENTLY NOT AVAILABLE TO THE USER)
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P0144	SUPERBANK 12	116	2000 - 3777	120 - 127	270000 - 287777	(PRESENTLY NOT AVAILABLE TO THE USER)
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P0145 SUPERBANK MAYBE CALLED IN THIS FASHION:

P0146 CAP ABPCCN WHERE -- ABPCCN BBCCN SOMETHIN --

P0147 TOP SUPERBANK (THE SUPERBANK BITS ARE IN THE BBCCN)

R0148 ...

R0149 .

R0150 .

R0151 (X IN THIS FASHION :

R0152 CAP SUPERSET WHERE SUPERSET IS ONE OF THE FOLLOW AVAILABLE

R0154 TOP SUPERBANK SUPERBANK BIT CONSTANTS:

R0155 ... SUPER111 OCTAL 60

R0157 . SUPER110 OCTAL 100

R0158 . SUPER101 OCTAL 120

R0161 . SUPER110 OCTAL 140

P0163	DEF 14	LAST	991	4727	10006 1	SUPERBANK	EXTEND		
P0164	DEF 14	LAST	991	4730	10007 1	SUPERBANK	WRITE		WRITE BITS 7-6-5 OF THE ACCUMULATOR INTO CHANNEL 07
P0165	DEF 250	LAST	992	4731	10002 0	SUPERBANK	TC	Q	TC TO INSTRUCTION FOLLOWING
P0166	DEF 250	LAST	992	4731	10002 0	SUPERBANK	TC	Q	TC SUPERBANK

L INTERPRETER

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R0001 SECTION 1 DISPATCHER

R0002 ENTRY TO THE INTERPRETER. INTERPRET SETS LOC TO THE FIRST INSTRUCTION, BANKSET TO THE BANK OF THE
 R0004 OBJECT INTERPRETIVE PROGRAM, AND INITIATES TO THE BIT15 CONTENTS OF FBANK. INTERPRETIVE PROGRAMS MAY BE IN
 R0006 VIRTUALLY ALL BANKS PRESENT UNDER ANY SUPER-BANK SETTING, WITH THE RESTRICTION THAT PROGRAMS IN HIGH BANKS
 R0008 (BIT15 OF FBANK = 1) DO NOT REFER TO LOWBANKS, AND VICE-VERSA. THE INTERPRETER DOES NOT SWITCH SUPERBANKS.
 R0010 E-BANK SWITCHING OCCURS WHENEVER GENERAL FRASABLE (110 - 3777) IS ADDRESSED.

0012					6 42		BLOCK 03	
0013	REF	1					COUNT* 16/INTER	
0013 ^e					6042 0 000 1	INTPRET	RELINT	
0014					6043 0 000 6 1		EXTEND	
0015	REF	7	LAST	992	6044 22 164 1		EXCF LOC	SET LOC TO THE WORD FOLLOWING THE TC.
0016	REF	24	LAST	992	6045 3 000 6 1	+2	CA FBANK	INTERPRETIVE FRANCHES FINISH HERE.
0017	REF	2	LAST	992	6046 54 165 1		TS BANKSET	
0018	REF	36	LAST	992	6047 7 4735 0		MASK BIT15	GET 15TH BIT FOR INDEXABLE ADDRESSES.
0019	REF	5	LAST	96	6050 54 115 0		TS INTRIT15	
0020	REF	8	LAST	992	6051 54 023 1		TS EOP	MAKE SUFFICIENT INSTRUCTIONS LEFT OVER
0021	REF	1			6052 1 5173 1		TCF NEWOPS	PICK UP CP CODE PAIR AND BEGIN.
0022	REF	25	LAST	994	6053 22 006 1	INTRSM	EXCH FBANK	RESUME SUSPENDED INTERPRETIVE JOB
0023	REF	219	LAST	974	6054 1 6045 1		TCF INTERPRET +3	
R0024								DLOAD LOADS MPAC, MPAC +1, LEAVING ZERO IN MPAC +2.
0025					6055 0 000 6 1	DLOAD	EXTEND	
0026	REF	4	LAST	914	6056 5 0116 1		INDEX ACOPWD	
0027					6057 3 000 1 0		DCA 0	LOAD OF C(C(ACOPWD)) INTO MPAC, MPAC +1
0028	REF	374	LAST	955	6060 52 155 1	SLCAD2	EXCF MPAC	
0029	REF	186	LAST	958	6061 3 4755 1		CAF ZFRO	ZERO MPAC +2

L INTERPRETER

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P0030 AT THE END OF MOST INSTRUCTIONS, CONTROL IS GIVEN TO DANZIG TO DISPATCH THE NEXT OPERATION.

0032	RFF	375	LAST	994	6062	54	156	1	TS	MPAC +2	AND DECLARE CP MODE
0033	RFF	15	LAST	879	6063	54	163	1	NEWMODE	TS	MODE
0034	RFF	3	LAST	994	6064	3	165	0	DANZIG	CA	BANKSET
0035	RFF	26	LAST	994	6065	54	166	0	TS	RBANK	SET BANK BEFORE TESTING NEWJOB SO THAT IT MAY BE SAVED DIRECTLY BY CHANGE.
0036	RFF	9	LAST	994	6066	10	173	1	NOIRANKSW	CCS	EDCP
0037	RFF	1			6067	1	182	0	TCF	OFJUMP	SEE IF AN OPCODE CODE IS LEFT OVER FROM THE LAST PAIR RETRIEVED. IF SO, EXECUTE. EDCP IS SET TO ZERO ON ITS RE-EDITING.
A0039											
0039	RFF	6	LAST	717	6070	10	167	1	CCS	NEWJCE	SEE IF A JOB OF HIGHER PRIORITY IS PRESENT, AND IF SO, CHANGE JOBS.
0040	RFF	1			6071	1	5126	0	TCF	CHANGE2	
0041	RFF	8	LAST	994	6072	24	164	1	INCR	LCC	ADVANCE THE LOCATION COUNTER.
R0042											
0043	RFF	9	LAST	995	6073	50	164	1	NEWOPS	INDEX	LCC
0044					6074	3	0000	1	CA	0	ENTRY TO BEGIN BY PICKING CP CODE PAIR. MAY BE AN OPCODE PAIR OR A STORE CODE.
0045	RFF	312	LAST	990	6075	10	000	0	CCS	A	TEST SIGN AND GET DABS(A).
0046	RFF	1			6076	1	5265	0	TCF	DOSTORE	PROCESS STORE CODE.
0047					6077	0	177	0	LCW7	CCT	177
0048	RFF	10	LAST	995	6100	54	173	1	TS	EDCP	CP CODE PAIR. LEAVE THE OTHER IN EDCP
0049	RFF	6	LAST	455	6101	7	6177	0	MASK	LCW7	WHERE CCS EDCP WILL HANDLE IT NEXT.
0050	RFF	13	LAST	462	6102	54	182	1	OFJUMP	TS	CYR
0051	RFF	14	LAST	995	6103	10	170	1	CCS	CYR	LCW7 INTERPS HERE IF A RIGHT-HAND CP CODE IS TO BE PROCESSED. TEST PREFIXES.
0052	RFF	1			6104	1	6252	0	TCF	OFJUMP2	TEST SFCNC PREFIX BIT.
0053	RFF	1			6105	1	6746	0	TCF	EXIT	+C CP CODE IS EXIT.

L INTERPRETER

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P0054 PROCESS ADDRESSES WHICH MAY BE DIRECT, INDEXED, OR REFERENCE THE FLUSHDOWN LIST.

0056	REF	48	LAST	972	6106	7 4753 0	ADDRESS	MASK	BIT1	SEE IF ADDRESS IS INDEXED. CYR CONTAINED
0057	REF	213	LAST	995	6177	10 000 0		CCS	A	400XX, SO BIT 1 IS NOW AS IT WAS IN CYR.
0058	REF	1			6111	1 6151 0		TCF	INDEX	FORM INDEXED ADDRESS.
0059	REF	1	LAST	995	6111	50 164 1	CIRADPES	INDEX	LCC	LOOK AHEAD TO NEXT WORD TO SEE IF
0060					6112	4 0001 1	00740001	CS	1	ADDRESS IS GIVEN.
0061	REF	314	LAST	996	6113	10 000 0		CCS	A	
0062	REF	1			6114	1 6220 0		TCF	PUSHUP	IF NOT.
0063					6115	77773 1	N504	DEC	-4	
0064	REF	11	LAST	996	6116	24 164 1		INCR	LCC	IF SO, TO SHOW WE PICKED UP A WORD.
0065	REF	5	LAST	994	6117	54 116 0		IS	ADDRWD	

1 TEXT DEFFTER

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PO066 FINAL DISSEMINATION DIRECT ADDRESSES OF OF CODES WITH 01 PREFIX IS DONE HERE. IN EACH CASE, THE
 K0068 REQUIRED 12-BIT SUB-ADDRESS IS LEFT IN ADDRWD, WITH ANY REQUIRED E OF F BANK SWITCHING DONE. ADDRESSES LESS
 R0070 THAN 450 ARE TAKEN TO BE RELATIVE TO THE WORK AREA. THE OF CODE IS NOW IN BITS 1-5 OF CYR WITH BIT 14 = 1.

0072	REF	1		6120	6 6254 1	AD	-ENDVAC	SEE IF ADDRESS RELATIVE TO WORK AREA.
0073	REF	215	LAST 996	6121	10 000 0	CCS	A	
0074	REF	1		6122	6 7746 0	AD	-ENDERAS	IF NOT, SEE IF IN GENERAL ERASABLE.
0075	REF	1		6123	1 6130 1	TCF	IFRSTST	
0076	REF	38	LAST 994	6124	3 0127 1	SETZEP	CA	FIXLOC
0077	REF	6	LAST 996	6125	26 116 0	ADS	ADDRWD	IF SO, LEAVE THE MODIFIED ADDRESS IN
0078	REF	15	LAST 995	6126	50 021 0	ITR15	INDEX	ADDRWD AND DISPATCH.
0079	REF	1		6127	7 6276 0	7	INJUMP	THIS INDEX MAKES THE NEXT INSTRUCTION
								TCF INJUMP + DP, EDITING CYR.
0080				6130	0 0006 1	IFRSTST	EXTEND	
0081	REF	1		6131	6 6141 1	EXTEND	GEADER	CC PROCESS GENERAL-ERASABLE ADDRESS.
0082	REF	14	LAST 992	6132	7 5712 1	MASK	LOW10	FIXED BANK ADDRESS. RESTORE AND ADD R15.
0083	REF	15	LAST 997	6133	6 5012 1	AD	LOW10	SWITCH BANKS AND LEAVE SLEADDRESS IN
0084	REF	7	LAST 997	6134	56 116 1	XCH	ADDRWD	ADDRWD FOR OPERAND RETRIEVAL. (THIS
0085	REF	6	LAST 994	6135	6 0115 1	AD	INT1115	METHOD PRECLUDES USE OF THE LAST
0086	REF	12	LAST 992	6136	54 004 1	TS	EBANK	LOCATION IN EACH FBANK.)
0087	REF	16	LAST 997	6137	50 021 0	ITR12	INDEX	
0088	REF	2	LAST 997	6140	7 6276 0	7	INJUMP	-1
0089	REF	10	LAST 985	6141	7 4357 0	GEADER	MASK	LOW8
0090	REF	3	LAST 462	6142	6 5007 0	AD	INT1400	
0091	REF	8	LAST 997	6143	56 116 1	XCH	ADDRWD	
0092	REF	50	LAST 985	6144	54 003 1	TS	EBANK	
0093	REF	17	LAST 997	6145	50 020 0	ITR10	INDEX	CYR
0094	REF	2	LAST 997	6146	7 6276 0	7	INJUMP	-1

L INTERPRETER

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P0095 THE FOLLOWING ROUTINE PROCESSES INTERPRETIVE INDEXED ADDRESSES. AN INTERPRETER INDEX REGISTER MAY
 R0097 CONTAIN THE ADDRESS OF ANY FEASIBLE REGISTER (0-42 BEING RELATIVE TO THE VAC AREA) OR ANY INTERPRETIVE PROGRAM
 R0099 BANK, OR ANY INTEGER IN THAT RANGE.

0100	REF	1		6147	3 7736 1	DECLCAD*	CAF	DLCAE*	STOCL* COMES HERE TO PROCESS LCAD ACP.
0101	REF	18	LAST 997	6150	54 721 1		TS	CYF	(STOCL* ENTERS HERE).
0102	REF	39	LAST 997	6151	3 0120 1	INDEX	CA	FIXLOC	SET LF INDEX LOCATION.
0103	REF	1		6152	54 130 1		TS	INDEXLOC	
0104	REF	12	LAST 994	6153	24 164 1		INCR	LCC	(ADDRESS ALWAYS GIVEN).
0105	REF	13	LAST 998	6154	50 164 1		INDEX	LCC	
0106				6155	4 0000 0		CS	0	
0107	REF	116	LAST 997	6156	10 130 0		CCS	A	INDEX 2 IF ADDRESS STORED COMPLEMENTED.
0108	REF	2	LAST 998	6157	24 131 0		INCR	INDEXLOC	
0109				6160	16 161 0		ACCF		
0110	REF	9	LAST 997	6161	54 116 0		TS	ACDRWD	14 BIT ADDRESS TO ADRWD.
0111	REF	1		6162	7 7745 1		MASK	HIGH4	IF ADDRESS GREATER THAN 2K, ADD INTBIT15
0112				6163	0 0176 1		EXTEND		
0113	REF	1		6164	1 6167 0		BZF	INDEX2	
0114	REF	7	LAST 997	6165	3 0115 1		CA	INTBIT15	
0115	REF	10	LAST 998	6166	26 116 0		ADS	ACDRWD	
0116	REF	3	LAST 998	6167	50 131 0	INDEX2	INDEX	INDEXLOC	
0117	REF	27	LAST 994	6170	4 0746 1		CS	X1	
0118	REF	11	LAST 998	6171	26 116 0		ADS	ACCPWD	DC ALIGNMENT, IGNORING AND CORRECTING CYF.
0119	REF	8	LAST 994	6172	7 7747 0		MASK	HIGH9	SEE IF ADDRESS IS IN WORK AREA.
0120				6173	0 0006 1		EXTEND		
0121	REF	1		6174	1 6207 0		BZF	INWORK	
0122	REF	2	LAST 998	6175	7 7745 1		MASK	HIGH4	SEE IF IN FIXED BANK.
0123				6176	0 0006 1		EXTEND		
0124	REF	1		6177	1 6211 1		BZF	INCREASE	
0125	REF	12	LAST 998	6200	3 0116 1		CA	ACDRWD	IN FIXED - SWITCH BANKS AND CREATE
0126	REF	13	LAST 997	6201	54 074 1		TS	FRANK	SUB-ADDRESS.
0127	REF	16	LAST 997	6202	7 5612 0		MASK	LCW10	
0128	REF	1		6203	6 4741 1		AD	2K	
0129	REF	13	LAST 998	6204	54 116 0		TS	ACDRWD	
0130	REF	19	LAST 998	6205	50 020 0	ITR11	INCR	CYP	
0131	REF	4	LAST 997	6206	3 6276 1		2	INCLUMP -1	
0132	REF	40	LAST 998	6207	3 0120 1	INWORK	CA	FIXLOC	MAKE ACDRWD RELATIVE TO WORK AREA.
0133	REF	1		6210	1 6215 0		TCF	ITR13 -1	
0134	REF	4	LAST 997	6211	3 5007 0	INCREASE	CA	OCT1400	
0135	REF	14	LAST 998	6212	56 116 1		XCF	ACCPWF	
0136	REF	50	LAST 997	6213	54 063 0		TS	FRANK	
0137	REF	11	LAST 997	6214	7 4357 0		MASK	LCWR	
0138	REF	15	LAST 998	6215	26 116 0	-1	ADS	ACDRWD	

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0139	REF	20	LAST	99F	6216	51.020	1	1TH13	INDEX	CY5
0140	REF	5	LAST	99F	6217	3.6276	1		3	INDJUMP -1

L INTERPRETER

USER'S PAGE NO. 7 FG 52

P0141 PUSH-UP ROUTINES. WHEN AN OPERAND ADDRESS IS GIVEN, THE APPROPRIATE OPERAND IS TAKEN FROM THE PUSH-CCWN
 P0142 LIST. IN MOST CASES THE MODE OF THE RESULT (VECTOR OR SCALAR) OF THE LAST ARITHMETIC OPERATION PERFORMED
 P0145 IS THE SAME AS THE TYPE OF OPERAND DESIRED (ALL ADD/SUBTRACT ETC.). EXCEPTIONS TO THIS GENERAL RULE ARE LISTED
 P0147 BELOW (NOTE THAT IN EVERY CASE THE MODE REGISTER IS LEFT INTACT):

R0148 1. VXSC AND V/SC WANT THE OPPOSITE TYPE OF OPERAND, E.G., IF THE LAST OPERATION YIELDED A VECTOR
 P0150 RESULT, VXSC WANTS A SCALAR.

R0151 2. THE LOAD CODES SHOULD LOAD THE ACCUMULATOR INDEPENDENT OF THE RESULT OF THE LAST OPERATION. THIS
 P0153 INCLUDES VMOD, FLOAD, TLOAD, PDDL, AND PVL (INC PUSHLP WITH SLOAD).

R0154 3. SOME ARITHMETIC OPERATIONS REQUIRE A STANDARD TYPE OF OPERAND REGARDLESS OF THE PREVIOUS OPERATION.
 P0156 THIS INCLUDES SIGN WANTING OP AND TAC REQUIRING IF.

P0157	REF	2	LAST	739	6220	3	436	0	PUSHLP	GAF	OCT23	IF THE LOW 5 BITS OF CYR ARE LESS THAN
P0158	REF	21	LAST	999	6221	7	172	1		MASK	CYP	20, THIS OP REQUIRES SPECIAL ATTENTION.
P0159	REF	1			6222	6	6225	1		AD	-CCT10	(NO -J).
P0160	REF	317	LAST	998	6223	10	0010	0		CCS	A	
P0161	REF	1			6224	1	6236	1		TCF	REGUP	FOR ALL CODES GREATER THAN OCT 7.

P0162					6225	77767	1	-CCT10	CCT	-10		
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P0163	REF	1			6226	6	6115	1		AD	NEG4	WE NOW HAVE 7 - OF CODE(MOD4). SEE IF
P0164	REF	318	LAST	1000	6227	10	000	0		CCS	A	THE CF CODE (MOD4) IS THREE (REVERSE).
P0165	REF	319	LAST	1000	6230	5	000	1		INDEX	A	NO - THE MODE IS DEFINITE. PICK UP THE
P0166	REF	1			6231	4	6247	1		CS	NO.WDS	
P0167	REF	2	LAST	1000	6232	1	6240	0		TCF	REGUP +2	

P0168	REF	16	LAST	995	6233	50	163	0		INDEX	MODE	FOR VXSC AND V/SC WE WANT THE REQUIRED
P0169	REF	4	LAST	954	6234	4	6245	0		CS	REVCNT	PUSHLOC DECREMENT WITHOUT CHANGING THE
P0170	REF	3	LAST	1000	6235	1	6240	0		TCF	REGUP +2	MODE AT THIS TIME.

P0171	REF	17	LAST	1000	6236	50	163	0	REGUP	INDEX	MODE	MOST ALL OP CODES PUSHLP HERE.
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P0172	REF	2	LAST	1000	6237	4	6247	1		CS	NO.WDS	
P0173	REF	11	LAST	979	6240	26	166	1	+2	ADS	PLSHLOC	
P0174	REF	16	LAST	998	6241	54	116	0		TS	ACRWD	
P0175	REF	22	LAST	1000	6242	5	020	0	ITR14	INDEX	CYP	
P0176	REF	6	LAST	999	6243	7	6275	0		7	INDJUMP -1	(THE INDEX MAKES THIS A TCF.)

P0177					6244	10002	0			CCT	2	REVERSE PUSHUP DECREMENT. VECTOR TAKES 2
P0178					6245	00006	1	REVCNT		CCT	6	WORDS, SCALAR TAKES 6.

P0179					6246	00106	1			CCT	6	
P0180					6247	00002	0	NO.WDS		CCT	2	CONVENTIONAL DECREMENT IS 6 WORDS VECTOR
P0181					6250	00003	1	OCTAL3		OCT	3	2 IN CP, AND 3 IN TP.
P0182					6251	00006	1			CCT	6	

L INTERPRETER

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P0183 TEST THE SECOND PREFIX BIT TO SEE IF THIS IS A MISCELLANEOUS OR A UNARY/SHORT SHIFT OPERATION.

0185	REF	23	LAST 1000	6252	1	020	1	CFJUMP2	CCS	CYP	TEST SECOND PREFIX BIT.
0186	REF	1		6253	1	6266	1	TCF	CFJUMP3		TEST THIRD BIT TO SEE IF UNARY OR SHIFT.
0187				6254	77722	0		-ENOVAC	DEC	-45	

R0188 THE FOLLOWING ROUTINE PROCESSES ADDRESSES OF SUFFIX CLASS 10. THEY ARE BASICALLY WORK AREA ADDRESSES
 R0190 IN THE RANGE 0 - 52, FEASIBLE ECADR CONSTANTS FROM 100 - 2777, AND ECADRS ABOVE THAT. ALL 15 BITS ARE AVAILABLE
 R0192 IN CONTRAST TO SUFFIX 1, IN WHICH ONLY THE LOW ORDER 14 ARE AVAILABLE.

0193	REF	14	LAST 998	6255	24	164	1	1FBITADR	INCR	LDC	(ENTRY HERE FROM STCALL1.
0194	REF	15	LAST 1001	6256	50	164	1		INDEX	LDC	PICK UP ADDRESS WCPD.
0195				6257	3	0000	1		CA	0	
0196	REF	6	LAST 98	6260	54	117	1		TS	POLISH	WE MAY NEED A SUBADDRESS LATER.
0197	REF	1		6261	3	5013	0		CAF	LOW7+2K	THESE INSTRUCTIONS ARE IN BANK 1.
0198	REF	14	LAST 998	6262	54	004	1		TS	FEANK	
0199	REF	24	LAST 1001	6263	7	0020	1		MASK	CYP	
0200	REF	220	LAST 1000	6264	50	000	1	ITR7	INDEX	A	
0201	REF	1		6265	1	6237	1		TCF	MISCJUMP	

L INTERPRETER

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P0202 COMPLETE THE DISPATCHING OF UNARY AND SHORT SHIFT OPERATIONS.

0203	REF	15	LAST 1001	6266	54 004 1	CPJUMP3	TS	FEANK	CALL IN BANK C (BITS 11-15 OF A ARE C.)
R0204			ITTACE (F) REFERS TO "CPJUMP3".						
0205	REF	25	LAST 1001	6267	10 020 1		CCS	CYI	TEST THIRD PREFIX BIT.
0206	REF	321	LAST 1001	6270	50 000 1		INDEX	A	THE DECREMENTED UNARY CODE IS IN BITS
0207	REF	1		6271	1 2200 1		TCF	UNAJUMP	1-4 OF A (ZERO, EXIT, HAS BEEN DETECTED)
0208	REF	18	LAST 1000	6272	10 163 1		CCS	MCDE	ITS A SHORT SHIFT CODE. SEE IF PRESENT
0209	REF	1		6273	1 2017 1		TCF	SHORTT	SCALAR OR VECTOR.
0210	REF	2	LAST 1002	6274	1 2017 1		TCF	SHORTT	
0211	REF	1		6275	1 2121 0		TCF	SHORTV	CALLS THE APPROPRIATE ROUTINE.
0212	REF	1		435		FRANKMSK	EQUALS	PANKMSK	
0213	REF	24	LAST 616	6276	01122 0	LVEUF	ACRES	VPLF	

L INT ADAPTER

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P0214 THE FOLLOWING IS THE JUMP TABLE FOR CP CODES WHICH MAY HAVE INDEXABLE ADDRESSES OR MAY PUSH UP.

0216	REF	1		6277	1	6510	1	INDJMP	TCF	VLOAD	00 - LCAC MPAC WITH A VECTOR.
0217	REF	1		6300	1	7274	1		TCF	TAN	01 - TRIPLE PRECISION ADD TO MPAC.
0218	REF	1		6311	1	7662	1		TCF	SIGN	02 - COMPLEMENT MPAC (V OR SC) IF X NEG.
0219	REF	1		6312	1	74	4	1	TCF	VXSC	03 - VECTOR TIMES SCALAR.
0220	REF	1		6313	1	6716	1		TCF	CGOTO	04 - COMPUTED GO TO.
0221	REF	2	LAST 3FF	6314	1	6473	0		TCF	TLOAD	05 - LCAC MPAC WITH TRIPLE PRECISION.
0222	REF	1		6315	1	6755	0		TCF	DLOAD	06 - LCAC MPAC WITH A CP SCALAR.
0223	REF	1		6316	1	7627	1		TCF	V/SC	07 - VECTOR DIVIDED BY SCALAR.
0224	REF	1		6317	1	6504	1		TCF	SLOAD	10 - LCAC MPAC IN SINGLE PRECISION.
0225	REF	1		6318	1	6623	1		TCF	SSP	11 - SET SINGLE PRECISION INTO X.
0226	REF	1		6311	1	6526	1		TCF	PEPL	12 - PUSH DOWN MPAC AND RE-LOAD IN CP.
0227	REF	1		6312	1	7327			TCF	MXV	13 - MATRIX POST-MULTIPLIED BY VECTOR.
0228	REF	1		6313	1	6562	1		TCF	PDVL	14 - PUSH DOWN AND VECTOR LCAC.
0229	REF	1		6314	1	6631	1		TCF	CCALL	15 - COMPUTED CALL.
0230	REF	1		6315	1	7342	1		TCF	VXV	16 - MATRIX PRE-MULTIPLIED BY VECTOR.
0231	REF	1		6316	1	7621	1		TCF	TSLO	17 - NORMALIZE MPAC (SCALAR ONLY).
0232	REF	1		6317	1	7577	1		TCF	DMPP	20 - CP MULTIPLY AND ROUND.
0233	REF	1		6320	1	7602	0		TCF	DDV	21 - CP DIVIDE BY.
0234	REF	1		6321	1	7515	1		TCF	DDCV	22 - CP DIVIDE INTO.
0235	REF	1		6322	1	7624	1		TCF	GSHIFT	23 - GENERAL SHIFT INSTRUCTION.
0236	REF	1		6323	1	6754	0		TCF	VAD	24 - VECTOR ADD.
0237	REF	1		6324	1	6752	0		TCF	VSL	25 - VECTOR SUBTRACT.
0238	REF	1		6325	1	7041	1		TCF	RVSL	26 - VECTOR SUBTRACT FROM.
0239	REF	1		6326	1	7334	0		TCF	DOT	27 - VECTOR DOT PRODUCT.
0240	REF	1		6327	1	7463	0		TCF	VXV	30 - VECTOR CROSS PRODUCT.
0241	REF	1		6330	1	7430	0		TCF	VPROJ	31 - VECTOR PROJECTION.
0242	REF	1		6331	1	7010	0		TCF	DSU	32 - CP SUBTRACT.
0243	REF	1		6332	1	7465	1		TCF	RCSL	33 - CP SUBTRACT FROM.
0244	REF	1		6333	1	7000	1		TCF	DAD	34 - CP ADD.
0245	REF	1		6334	1	6324	1		TCF		35 - AVAILABLE.
0246	REF	1		6335	1	7575			TCF	DMPL	36 - CP MULTIPLY.
0247	REF	1		6336	1	7616	0		TCF	SETPD	37 - SET PUSH DOWN POINTER (DIRECT ONLY).

P0249 CODES 1 AND 14 MUST NOT PUSH UP. CODE 04 MAY BE USED FOR VECTOR DECLARE BEFORE PUSHUP IF DESIRED.

L INTERPRETER

USER'S PAGE NO. 11 EQ S3

P0250 THE FOLLOWING JUMP TABLE APPLIES TO INDEX, BRANCH, AND MISCELLANEOUS INSTRUCTIONS.

0252	REF	I	6337	I 2345 0	MISCJUMP	TCF	AXT	00 - ADDRESS TO INDEX TRUE.
0253	REF	I	6340	I 2352 0		TCF	AXC	01 - ADDRESS TO INDEX COMPLEMENTED.
0254	REF	I	6341	I 2355 1		TCF	LXA	02 - LOAD INDEX FROM ERASABLE.
0255	REF	I	6342	I 2361 0		TCF	LXC	03 - LOAD INDEX FROM COMPLEMENT OF ERAS.
0256	REF	I	6343	I 2365 1		TCF	SXA	04 - STORE INDEX IN ERASABLE.
0257	REF	I	6344	I 2373 0		TCF	XCHX	05 - EXCHANGE INDEX WITH ERASABLE.
0258	REF	I	6345	I 2407 1		TCF	INCR	06 - INCREMENT INDEX REGISTER.
0259	REF	I	6346	I 2416 1		TCF	TIX	07 - TRANSFER ON INDEX.
0260	REF	I	6347	I 2411 1		TCF	XAD	10 - INDEX REGISTER ADD FROM ERASABLE.
0261	REF	I	6350	I 2412 0		TCF	XSD	11 - INDEX SUBTRACT FROM ERASABLE.
0262	REF	I	6351	I 2470 1		TCF	BZF/GCTG	12 - BRANCH ZERO AND GOTO.
0263	REF	I	6352	I 2475 1		TCF	BPL/BMN	13 - BRANCH PLUS AND BRANCH MINUS.
0264	REF	I	6353	I 2450 0		TCF	RTB/BHIZ	14 - RETURN TO BASIC AND BRANCH HI ZERO.
0265	REF	I	6354	I 2510 0		TCF	CALL/ITA	15 - CALL AND STORE GPRF.
0266	REF	I	6355	I 2517 1		TCF	SW/	16 - SWITCH INSTRUCTIONS ARE AVAILABLE.
0267	REF	I	6356	I 246 0		TCF	BCV(B)	17 - BRANCH ON OVERFLOW TO BASIC OR INT.

L INT REPTED

LSFR'S PAGE NO. 12 FO S3

P0269 THE FOLLOWING JUMP TABLE APPLIES TO LUNARY INSTRUCTIONS.

0269	REF	2 LAST	594 TO 1015:	205	205*	COUNT# \$\$/INTER	
0270						BANK 0	00 - EXIT - DETECTED EARLIER.
0271	REF	1		00,2000	1 3207 0	LNALJMP	01 - SQUARE ROOT.
0272	REF	1		00,2001	1 3530 0	TCF	02 - SIN.
0273	REF	1		00,2002	1 3517 0	TCF	03 - COS.
0274	REF	1		00,2003	1 3612 1	TCF	04 - ARC SIN.
0275	REF	1		00,2004	1 3612 0	TCF	05 - ARC COS.
0276	REF	1		00,2005	1 2174 1	TCF	06 - OF SQUARE.
0277	REF	1		00,2006	1 2116 1	TCF	07 - ROUND TO DP.
0278	REF	1		00,2007	1 7673 1	TCF	10 - COMPLEMENT VECTOR OF SCALAR.
0279	REF	1		00,2008	1 3232 1	TCF	11 - VECTOR DEFINE.
0280	REF	2	LAST 604	00,2011	1 3123 1	TCF	12 - UNIT VECTOR.
0281	REF	1		00,2012	1 3176 0	TCF	13 - LENGTH OF VECTOR OR MAG OF SCALAR.
0282	REF	1		00,2013	1 3245 0	TCF	14 - SQUARE OF LENGTH OF VECTOR.
0283	REF	1		00,2014	1 6357 1	TCF	15 - PLSH LP ON SLOPE CODE.
0284	REF	1		00,2015	1 3274 1	TCF	16 - RETURN VIA GPRET.
0285	REF	1		00,2016	1 3247 1	TCF	17 - PLSH MPAC DOWN.

L INTERPRETER

USER'S PAGE NO. 13 PG 52

P0286 SECTION 2 LOAD AND STORE PACKAGE.

P0287 A SET OF EIGHT STORE CODES IS PROVIDED AS THE PRIMARY METHOD OF STORING THE MULTI-PURPOSE
 R0289 ACCUMULATOR (MPAC). IF IN THE DANCING SECTION LDC REFERS TO AN ALGEBRAICALLY POSITIVE WORD, IT IS TAKEN AS A
 R0291 STORE CODE WITH A CORRESPONDING REASABLE ADDRESS. MOST OF THESE CODES ARE TWO ADDRESS, SPECIFYING THAT THE WORD
 R0293 FOLLOWING THE STORE CODE IS TO BE USED AS AN ADDRESS FROM WHICH TO RE-LOAD MPAC. FOUR OPTIONS ARE AVAILABLE:

R0295 1. STORE STORE MPAC. THE F ADDRESS MAY BE INDEXED.
 R0297 2. STODL STORE MPAC AND RE-LOAD IT IN CP WITH THE NEXT ADDRESS (THE LOAD MAY BE INDEXED).
 R0299 3. STOVI STORE MPAC AND RE-LOAD A VECTOR (AS ABOVE).
 R0301 4. STCALI STORE AND DO A CALL (PCTH ADDRESSES MUST BE DIRECT HERE).

R0303 STODL AND STOVI WILL TAKE FROM THE PUSH-DOWN LIST IF NO LOAD ADDRESS IS GIVEN.

0305		6357		BLOCK 3	
0306	REF 2	LAST 1005 TO 1006	15 220*	CCOUNT*	34/INTER
0307	REF 4	LAST 995	6357 2 116 1	STADR	CA BANKSET
0308	REF 16	LAST 1002	6360 54 104 1	TS	FRANK
0309	REF 16	LAST 1001	6361 24 154 1	INCR	LCC
0310	REF 17	LAST 1006	6362 5 164 1	INTR1	INDEX LCC
0311			6363 4 111 0	CS	J
0312	REF 6	LAST 986	6364 6 7752	AD	AFGENF
0313	REF 17	LAST 1000	6365 54 116 0	DCSTORE	TS ADDRWD
0314	REF 7	LAST 463	6366 7 4356 1	MASK	LCW11
0315	REF 18	LAST 1006	6367 56 116 1	XCH	ADDRWD
0316	REF 1		6370 7 7725 1	MASK	612714
0317			6371 0 1016 1	EXTEND	
0318	REF 38	LAST 816	6372 7 4747 0	MP	BITS
0319	REF 322	LAST 1002	6373 51 110 1	INTR0	INDEX A
0320	REF 1		6374 1 6375 1	TCF	STORJUMP

THE STACK CODE (PUSHUP UP ON STORE ADDRESS) ENTERS HERE.

THE STORECODE WAS STORED COMPLEMENTED TO MAKE IT LOOK LIKE AN CPCODE PAIR. (YOU CANT REMOVE 1 BECAUSE OF EARLY CCS)

ENTRY FROM DISPATCHER. SAVE THE REASABLE ADDRESS AND JUMP ON THE STORE CODE NO.

EACH TRANSFER VECTOR ENTRY IS TWO WORDS.

I INTERPRETER

USF'S PAGE NO. 14 EC S3

P0321 STORE CODE JUMP TABLE. CALLS THE APPROPRIATE STORING ROUTINE AND EXITS TO DANZIG OR TO ADDRESS WITH
 R0323 A SUPPLIED OPERATION CODE.

P03231 STORE STORE,1 AND STORE,2 RETURN TO DANZIG, THUS RESETTING THE EBANK TO ITS STATE AT INTERP.

0324	REF	1		6375	0	6425	1	STORJUMP	TC	STORE	STORE.
0325	REF	2	LAST 941	6376	1	6064	1		TCF	DANZIG	PICK UP NEW CF CODE(S).
0326	REF	1		6377	0	6417	0		TC	STORE,1	
0327	REF	3	LAST 1007	6400	1	6064	1		TCF	DANZIG	
0328	REF	1		6401	0	6422	0		TC	STORE,2	
0329	REF	4	LAST 1007	6402	1	6164	1		TCF	DANZIG	
0330	REF	2	LAST 1007	6403	0	6425	1		TC	STORE	STORE.
0331	REF	1		6404	1	6463	1		TCF	DEVLCD	
0332	REF	3	LAST 1007	6405	0	6425	1		TC	STORE	STORE WITH INDEXED LOAD ADDRESS.
0333	REF	1		6406	1	6147	1		TCF	DEVLCD*	
0334	REF	4	LAST 1007	6407	0	6425	1		TC	STORE	STORE.
0335	REF	1		6408	1	6466	1		TCF	DEVLCD	
0336	REF	5	LAST 1007	6411	0	6425	1		TC	STORE	STORE WITH INDEXED LOAD ADDRESS.
0337	REF	1		6412	1	6471	1		TCF	DEVLCD*	
0338	REF	6	LAST 1007	6413	0	6425	1		TC	STORE	STORE.
0339	REF	2	LAST 280	6414	3	4766	1		CAF	CALC CODE	
0340	REF	26	LAST 1002	6415	54	020	1		TS	CYP	
0341	REF	1		6416	1	6255	1		TCF	15BITADR	GET A 15 BIT ADDRESS.

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P0342 STORE CODE ADDRESS PROCESSOR.

0343	REF	41	LAST	998	6417	50	120	1	STORE,1	INDEX	FIXLCC
0344	REF	28	LAST	998	6421	4	0	46	1	CS	X1
0345	REF	1			6421	1	6424	1		TCF	PRESTORE
0346	REF	42	LAST	1008	6422	50	120	1	STORE,2	INDEX	FIXLCC
0347	REF	18	LAST	978	6423	4	0	46	0	CS	X2
0348	REF	19	LAST	1008	6424	26	116	0	PRESTORE	ADS	ADCPWD
0349	REF	21	LAST	1008	6425	4	0	116	1	STORE	CS
0350	REF	1			6426	6	4772	1		AC	DEC45
0351	REF	323	LAST	1008	6427	10	110	0		CCS	A
0352	REF	43	LAST	1008	6431	3	7120	1		CA	FIXLCC
0353	REF	1			6431	1	5436	1		TCF	AFFACE
0354	REF	5	LAST	999	6432	3	507	0		CA	OCT14.0
0355	REF	21	LAST	1008	6433	56	116	1		XCF	ADCPWD
0356	REF	61	LAST	998	6434	54	113	0		TS	FRANK
0357	REF	12	LAST	998	6435	7	4357	0		MASK	LCWR
0358	REF	22	LAST	1008	6436	26	116	0	AFFACE	ADS	ADCPWD

RESULTANT ADDRESS IS IN ERASABLE.

DOES THE ADDRESS POINT TO THE WORK AREA?
YES.

NO. SET EBANK & MAKE UP SUBADDRESS.

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P0350 STORING ROUTINES. STORE OF, TP, CR VECTOR AS INDICATED BY MODE.

0361 6437 0 0006 1 STARTSIC EXTEND MPAC, +1 MUST BE STORED IN ANY EVENT.
 P0361 IT ACE (5) REF 25 T "STARTSIC".
 0362 REF 276 LAST 955 6441 3 0150 1 DCA MPAC
 0363 REF 23 LAST 1008 6441 50 116 1 INDEX ADDRWD
 0364 6442 52 001 1 EXCH Q

0365 REF 19 LAST 1002 6443 1 163 1 CCS MODE
 0366 REF 1 6444 1 6457 1 TCF TSTORE
 0367 REF 25 LAST 993 6445 1 0002 1 TC Q

0368 6446 2 0006 1 VSTORE EXTEND
 0369 REF 377 LAST 1009 6447 3 0160 0 DCA MPAC +3
 0370 REF 24 LAST 1009 6448 50 116 1 INDEX ADDRWD
 0371 6449 52 003 0 EXCH 2

0372 6452 0 0006 1 EXTEND
 0373 REF 378 LAST 1009 6453 3 0162 1 DCA MPAC +5
 0374 REF 25 LAST 1009 6454 50 116 1 INDEX ADDRWD
 0375 6455 52 005 0 EXCH 4
 0376 REF 252 LAST 1009 6456 0 0002 1 TC Q

0377 REF 379 LAST 1009 6457 3 0156 0 TSTORE CA MPAC +2
 0378 REF 26 LAST 1009 6458 50 116 1 INDEX ADDRWD
 0379 6461 54 002 1 TS 2
 0380 REF 253 LAST 1009 6462 0 0002 0 TC Q

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P0381 ROUTINES TO BEGIN PROCESSING OF THE SECOND ADDRESS ASSOCIATED WITH ALL STORE-TYPE CODES EXCEPT STORE
 R0383 ITSELF.

0384	REF	1		6463	3 7735 1	DOFLCAD	CAF	DLCADCCD	
0385	REF	27	LAST 1007	6464	54 020 1		TS	CYR	
0386	REF	1		6465	1 6111 1		TCF	DI/ADRES	CC GET A DIRECT ADDRESS.

0387	REF	1		6466	3 4735 1	DOVLAD	CAF	VLCADCCD	
0388	REF	28	LAST 1010	6467	54 020 1		TS	CYR	
0389	REF	2	LAST 1010	6470	1 6111 1		TCF	DISADRES	

0390	REF	1		6471	3 6112 0	DOVLAD*	CAF	VLOAD*	
0391	REF	2	LAST 1007	6472	1 6150 1		TCF	DOFLCAD* +1	PROLOGUE TO INDEX ROUTINE.

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P0392 THE FOLLOWING LOAD INSTRUCTIONS ARE PROVIDED FOR LOADING THE MULTI-PURPOSE ACCUMULATOR MPAC.

0394	REF 27	LAST 1009	6473	50 116 1	TLOAD	INDEX	ADDRWD	
0395			6474	3 0012 1		CA	2	LOAD A TRIPLE PRECISION ARGUMENT INTO
0396	REF 387	LAST 1009	6475	54 155 1		IS	MPAC +2	THE FIRST THREE MPAC REGISTERS, WITH THE
0397			6476	0 00 5 1		EXTEND		CONTENTS OF THE OTHER FOUR IRRELEVANT.
0398	REF 28	LAST 1011	6477	5 0116 1		INDEX	ADDRWD	
0399			6500	3 0001 0		DCA	1	
0400	REF 381	LAST 1011	6501	52 155 1		EXCH	MPAC	
0401	REF 175	LAST 917	6502	3 4753 1	TNODF	CAF	CNF	
0402	REF 1		6503	1 6163 0	TCF	NEWMODE		DECLARE TRIPLE PRECISION MODE.
0403			6504	22 017 1	SLOAD	ZL		LOAD A SINGLE PRECISION NUMBER INTO
0404	REF 29	LAST 1011	6505	50 116 1		INDEX	ADDRWD	MPAC, SETTING MPAC+1,2 TO ZERO. THE
0405			6506	3 0000 1		CA	0	CONTENTS OF THE REMAINING MPAC REGISTERS
0406	REF 1		6507	1 6160 0		TCF	SLEAF2	ARE IRRELEVANT.
0407			6510	0 0006 1	VLOAD	EXTEND		LOAD A DOUBLE PRECISION VECTOR INTO
0408	REF 30	LAST 1011	6511	5 0116 1		INDEX	ADDRWD	MPAC+1, MPAC+3,4, AND MPAC+5,6. THE
0409			6512	3 0001 0		DCA	1	CONTENTS OF MPAC +2 ARE IRRELEVANT.
0410	REF 342	LAST 1011	6513	52 155 1		EXCH	MPAC	
0411			6514	0 0006 1	PADVLOAD	EXTEND		PCVL COMES HERE TO FINISH UP FOR DF, TF.
0412	REF 31	LAST 1011	6515	5 0116 1		INDEX	ADDRWD	
0413			6516	3 0003 1		CCA	2	
0414	REF 363	LAST 1011	6517	52 160 1		EXCH	MPAC +3	
0415			6520	0 0006 1	+4	EXTEND		PCVL FINISHES HERE.
0416	REF 32	LAST 1011	6521	5 0116 1		INDEX	ADDRWD	
0417			6522	3 0005 1		DCA	4	
0418	REF 384	LAST 1011	6523	52 162 0		EXCH	MPAC +5	
0419	REF 106	LAST 1011	6524	4 4753 0	VNODF	CS	CNF	DECLARE VECTOR MODE.
0420	REF 2	LAST 1011	6525	1 6163 0	TCF	NEWMODE		

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P1421 THE FOLLOWING INSTRUCTIONS ARE PROVIDED FOR STOPPING OPERANCES IN THE PUSH-DOWN LIST:

R1423 1. PUSH PUSH-DOWN AND AC LOAD.
 R1424 2. PDDL PUSH-DOWN AND CCELEF PRECISION LOAD.
 P1425 3. PDVL PUSH-DOWN AND VECTOR LOAD.

0426				0526	1 0106 1	PCCL	EXTEND		
0427	REF	33	LAST 1011	0527	5 0116 1		INDEX	ADDRWD	LOAD MPAC +1, PUSHING THE FORMER
0428				0530	3 0101 0		DCA	0	CONTENTS DOWN.
0429	REF	385	LAST 1011	0531	52 155 1		EXCH	MPAC	
0430	REF	12	LAST 1010	0532	50 166 0		INDEX	PLSHLCC	
0431				0533	52 001 1		EXCH	0	
0432	REF	20	LAST 1009	0534	50 163 0		INDEX	MCDE	ADVANCE THE PUSH-DOWN POINTER APPROPRIATELY.
0433	REF	3	LAST 1001	0535	3 6247 0		CAF	NC.WDS	
0434	REF	12	LAST 1012	0536	26 166 1		ADS	PUSHLOC	
0435	REF	21	LAST 1012	0537	10 163 1		CCS	MCDE	
0436	REF	1		0540	1 6555 0		TCF	ENDTPUSH	
0437	REF	1		0541	1 6553 0		TCF	ENDTPUSH	
0438	REF	22	LAST 1012	0542	54 163 1		TS	MCDE	NEW DF.
0439	REF	386	LAST 1012	0543	54 156 1	ENDVPLSH	TS	MPAC +2	
0440	REF	387	LAST 1012	0544	52 160 1		EXCH	MPAC +3	PUSH DOWN THE REST OF THE VECTOR HERE.
0441	REF	14	LAST 1012	0545	50 166 0		INDEX	PLSHLCC	
0442				0546	51 775 0		EXCH	0 -4	
0443	REF	388	LAST 1012	0547	52 162 0		EXCH	MPAC +5	
0444	REF	15	LAST 1012	0550	50 166 0		INDEX	PLSHLCC	
0445				0551	51 777 1		EXCH	0 -2	
0446	REF	5	LAST 1007	0552	1 6064 1		TCF	DANZIC	
0447	REF	389	LAST 1012	0553	54 156 1	ENDTPUSH	TS	MPAC +2	SET MPAC +2 TO ZERO AND EXIT ON DP.
0448	REF	6	LAST 1012	0554	1 6064 1		TCF	DANZIC	
0449	REF	23	LAST 1012	0555	54 163 1	ENDTPUSH	TS	MCDE	
0450	REF	390	LAST 1012	0556	56 156 0		EXCH	MPAC +2	ON TRIPLE, SET MPAC +2 TO ZERO, PUSHING
0451	REF	16	LAST 1012	0557	50 166 0	+2	INDEX	PLSHLCC	DOWN THE OLD CONTENTS
0452				0560	53 777 0		TS	0 -1	
0453	REF	7	LAST 1012	0561	1 6064 1		TCF	DANZIC	

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P0454 PDVL - PUSHDOWN AND VECTOR LOAD.

0455				6562	50 115 1	PDVL	EXTEND		RELOAD MPAC AND PUSH DOWN ITS CONTENTS.
0456	FFF	34	LAST 1012	6563	50 115 1		INDEX ADDRWD		
0457				6564	3 116 1		PCA	2	
0458	FFF	351	LAST 1012	6565	52 155 1		EXCH	MPAC	
0459	FFF	17	LAST 1012	6566	50 166 0		INDEX	PLSHLOC	
0460				6567	52 161 1		EXCH	0	

0461	FFF	24	LAST 1012	6570	50 163 0		INDEX	MODE	ADVANCE THE PLSHDCWN POINTER.
0462	FFF	4	LAST 1012	6571	2 6247 0		CAF	AC.WPS	
0463	FFF	18	LAST 1012	6572	26 166 1		ADS	PLSHLOC	

0464	FFF	25	LAST 1013	6573	10 163 1		CCS	MODE	TEST FAST MODE.
0465	FFF	1		6574	1 6513 1		TCF	TCDVI	
0466	FFF	1		6575	1 6514 1		TCF	ENDVLOC	JUST LOAD LAST FOUR REGISTERS ON DP.

0467				6576	10 1716 1	VPCVL	EXTEND		PUSHDOWN AND RE-LOAD LAST TWO COMPONENTS
0468	FFF	35	LAST 1013	6577	50 116 1		INDEX	ADDRWD	
0469				6602	3 116 1		PCA	2	
0470	FFF	352	LAST 1013	6601	52 161 1		EXCH	MPAC +3	
0471	FFF	10	LAST 1013	6602	50 166 0		INDEX	PLSHLOC	
0472				6603	51 1775 1		EXCH	0 -4	

0473				6604	0 116 1		EXTEND		
0474	FFF	36	LAST 1013	6605	50 116 1		INDEX	ADDRWD	
0475				6606	3 116 1		PCA	4	
0476	FFF	362	LAST 1013	6607	52 162 1		EXCH	MPAC +5	
0477	FFF	20	LAST 1013	6610	50 166 0		INDEX	PLSHLOC	
0478				6611	51 1777 1		EXCH	0 -2	

0479	FFF	8	LAST 1012	6612	1 6564 1		TCF	DANZIC	
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0480				6613	1 116 1	TPDVL	EXTEND		ON TP, WE MUST LOAD THE Y COMPONENT
0481	FFF	37	LAST 1013	6614	50 116 1		INDEX	ADDRWD	BEFORE STORING MPAC +2 IN CASE THIS IS A
0482				6615	2 116 1		PCA	2	FLUSHUP.
0483	FFF	354	LAST 1013	6616	52 161 1		EXCH	MPAC +3	

0484	FFF	255	LAST 1013	6617	2 116 1		CA	MPAC +2	
0485	FFF	21	LAST 1013	6620	50 166 0		INDEX	PLSHLOC	IN DP.
0486				6621	53 1777 0		TS	0 -1	
0487	FFF	2	LAST 1013	6622	1 6520 1		TCF	ENDVLOC +4	

R0488 SSP (STORE SINGLE PRECISION) IS EXECUTED HERE.

0489	FFF	18	LAST 1013	6623	24 164 1	SSP	INCR	LCC	PICK UP THE WORD FOLLOWING THE GIVEN
0490	FFF	19	LAST 1013	6624	50 164 1		INDEX	LCC	ADDRESS AND STORE IT AT X.
0491				6625	3 116 1		CA	0	
0492	FFF	38	LAST 1013	6626	50 116 1	STORE1	INDEX	ADDRWD	SAVE INDEX AND MISCELLANEOUS OPS END
0493				6627	54 116 1		TS	0	HERE.

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0464 REF 9 LAST 1013 6520 1 6 64 1 TCF CANZIO

1 INT PROPTER

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P0495 SEQUENCE CHANGING AND SUBROUTINE CALLING OPTIONS.

P0496 THE FOLLOWING OPERATIONS ARE AVAILABLE FOR SEQUENCING CHANGING, BRANCHING, AND CALLING SUBROUTINES:

P0498	1. GOTO	GO TO.
P0499	2. CALL	CALL SUBROUTINE SETTING GRET.
P0500	3. CGOTO	COMPUTED GO TO.
P0501	4. CCALL	COMPUTED CALL.
P0502	7. RPL	BRANCH IF MPAC POSITIVE OR ZERO.
P0503	8. RZF	BRANCH IF MPAC ZERO.
P0504	9. RBN	BRANCH IF MPAC NEGATIVE NON-ZERO.

P0505	RFF	20	LAST	1013	6631	24	164	1	CCALL	INCR	LCC	MAINTAIN LCC FOR GPRET COMPUTATION.
P0506	RFF	21	LAST	1015	6632	50	164	1		INDEX	LCC	
P0507	RFF				6633	3	100	1		CAF	C	GET BASE ADDRESS OF CACR LIST.
P0508	RFF	35	LAST	1013	6634	50	116	1		INDEX	ADDRWD	
P0509	RFF				6635	6	100	1		AD		ADD INCREMENT.
P0510	RFF	17	LAST	1006	6636	54	104	1		TS	FRANK	SELECT DESIRED CACR.
P0511	RFF	17	LAST	998	6637	7	512	0		MASK	LCW10	
P0512	RFF	324	LAST	1008	6640	50	100	1		INDEX	A	
P0513	RFF				6641	3	100	1		CAF	10000	
P0514	RFF	7	LAST	1001	6642	54	117	1		TS	PC11SH	

P0515	RFF	5	LAST	1006	6643	3	165	0	CALL	CA	RANKSET	FOR ANY OF THE CALL OPTIONS, MAKE UP THE
P0516	RFF	2	LAST	1002	6644	7	435	1		MASK	RANKMASK	ADDRESS OF THE NEXT OP-CCODE PAIR/STORE
P0517	RFF	3	LAST	1015	6645	6	435	0		AD	RANKMASK	CODE AND LEAVE IT IN GRET. NOTE THAT
P0518	RFF	22	LAST	1015	6646	6	164	1		AD	LCC	RANKMASK = -(2000 - 1).
P0519	RFF	44	LAST	1008	6647	50	120	1		INDEX	FIXICC	
P0520	RFF	9	LAST	992	6650	54	152	1		TS	GPRET	

P0521	RFF	8	LAST	1015	6651	3	117	0	GOTO	CA	PC11SH	PASIC BRANCHING SEQUENCE.
P0522	RFF	3	LAST	998	6652	7	7745	1	+1	MASK	HIGH4	
P0523	RFF				6653	0	1016	1		EXTEND		

P0524	RFF	1			6654	1	6665	0		FZF	GCTOFPS	SEE IF ADDRESS POINTS TO FIXED OR FRAS.
P0525	RFF	6	LAST	1015	6655	3	165	0	+4	CA	RANKSET	SET FRANK PART OF FRANK. NEXT, SET UP
P0526	RFF	27	LAST	995	6656	54	106	0		TS	BBANK	FRANK. THE COMBINATION IS PICKED UP &
P0527	RFF	5	LAST	1015	6657	2	117	0		CA	PC11SH	PUT INTO RANKSET AT INTERPRET +2.
P0528	RFF	18	LAST	1015	666	54	104	1		TS	FRANK	
P0529	RFF	18	LAST	1015	6661	7	512	0		MASK	LCW10	
P0530	RFF	2	LAST	998	6662	6	4741	1		AD	2K	
P0531	RFF	23	LAST	1015	6663	54	164	0		TS	LCC	
P0532	RFF	220	LAST	994	6664	1	6745	1		TCF	INTERPRET +3	

P0533					(3,140)					FRANK = 1400		SO YOU DON'T CUSS THE "CA 1400" BELOW.
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P0534	RFF	1	LAST	1015	6665	3	117	0	GCTOFPS	CA	PC11SH	THE GIVEN ADDRESS IS IN ERASABLE - SEE
P0535	RFF	2	LAST	997	6666	6	6254	1		AD	-ADVAC	IF RELATIVE TO THE WORK AREA.
P0536	RFF	325	LAST	1015	6667	10	100	0		CCS	A	
P0537	RFF	11	LAST	1015	6670	3	117	0		CA	PC11SH	GENERAL ERASABLE.
P0538	RFF	1			6671	1	6700	1		TCF	GCTOGE	

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0535	REF	45	LAST 1015	6672	3 120 1	CA	FIXLCC	WORK AREA.
0540	REF	12	LAST 1015	6673	6 0117 1	AD	PCLISH	
0541	REF	326	LAST 1015	6674	50 000 1	INDEX	A	USE THE GIVEN ADDRESS AS THE ADDRESS OF
0542				6675	3 000 1	CA	0	THE BRANCH ADDRESS.
0543	REF	13	LAST 1016	6676	54 117 1	TS	PCLISH	
0544	REF	1		6677	1 6652 1	TCF	GCTD +1	ALLOWS ARBITRARY INDIRECTNESS LEVELS.
0545	REF	42	LAST 1008	6700	54 003 0	GCTDGF	TS	FRANK
0546	REF	13	LAST 1016	6701	7 4357 0		MASK	LCW8
0547	REF	327	LAST 1016	6702	50 000 1	INDEX	A	USE THE GIVEN ADDRESS AS THE ADDRESS OF
0548				6703	3 1400 1	CA	1400	THE BRANCH ADDRESS.
0549	REF	14	LAST 1016	6704	54 117 1	TS	PCLISH	
0550	REF	2	LAST 1016	6705	1 6652 1	TCF	GCTD +1	
0551	REF	24	LAST 1015	6706	50 164 1	GCTD	INDEX	LCC
0552				6707	3 000 1	CA	1	COMPUTER GC TC. PICK UP ADDRESS OF CADR
0553	REF	40	LAST 1015	6710	50 116 1	INDEX	ADDRWD	LIST.
0554				6711	6 000 1	AD	0	ADD MODIFIER.
0555	REF	19	LAST 1015	6712	54 004 1	TS	FRANK	SELECT GCTC ADDRESS.
0556	REF	19	LAST 1015	6713	7 5012 0	MASK	LCW10	
0557	REF	328	LAST 1016	6714	50 000 1	INDEX	A	
0558				6715	3 2000 0	CA	10000	
0559	REF	15	LAST 1016	6716	54 117 1	TS	PCLISH	
0560	REF	3	LAST 1016	6717	1 6652 1	TCF	GCTC +1	WITH ADDRESS IN A.
0561	REF	7	LAST 1015	6720	3 0165 0	SWBRANCH	CA	BANKSET
0562	REF	20	LAST 1016	6721	54 004 1	TS	FRANK	SWITCH INSTRUCTIONS WHICH SELECT TO
0563	REF	25	LAST 1016	6722	50 164 1	INDEX	LCC	BRANCH COME HERE TO DO SO.
0564				6723	3 000 1	CA	1	
0565	REF	16	LAST 1016	6724	54 117 1	TS	PCLISH	
0566	REF	4	LAST 1016	6725	1 6652 1	TCF	GCTD +1	

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P0567 TRIPLE PRECISION BRANCHING ROUTINE. IF CALLING TC IS AT L, RETURN IS AS FOLLOWS:

P0569 1+1 IF MPAC IS GREATER THAN ZERO.

P0570 1+2 IF MPAC IS EQUAL TO +1 OR -1.

P0571 1+3 IF MPAC IS LESS THAN ZERO.

0572	REF 396	LAST 1013	6726	10 154 0	BRANCH	CCS	MPAC	
0573	REF 254	LAST 1009	6727	0 0002 0		TC	0	
0574			6731	1 6732 1		TCF	+2	ON ZERO.
0575	REF 1		6731	1 6744 1		TCF	NEG	
0576	REF 357	LAST 1017	6732	10 155 1		CCS	MPAC +1	
0577	REF 255	LAST 1017	6733	0 0002 0		TC	0	
0578			6734	1 6736 1		TCF	+2	
0579	REF 2	LAST 1 17	6735	1 6744 1		TCF	NEG	
0580	REF 348	LAST 1017	6736	10 156 1		CCS	MPAC +2	
0581	REF 256	LAST 1017	6737	0 0002 0		TC	0	
0582			6741	1 6742 1		TCF	+2	
0583	REF 3	LAST 1017	6741	1 6744 1		TCF	NEG	
0584	REF 257	LAST 1017	6742	50 002 0	Q+1	INDEX	0	
0585			6743	0 0002 0		TC	1	
0586	REF 258	LAST 1 17	6744	50 002 0	NEG	INDEX	0	IF FIRST NON-ZERO REGISTER WAS NEGATIVE.
0587			6745	0 0002 0		TC	2	
0588	REF 4	LAST 1017	6746		Q+2	=	NEG	
P0589		ITACE (3) REFERS TO "EXIT".						
0590	REF 8	LAST 1016	6746	3 0165 0	EXIT	CA	BANKSET	RESTORE USER'S BANK SETTING, AND LEAVE
0591	REF 28	LAST 1016	6747	54 016 0		TS	BANK	INTERPRETIVE MODE.
0592	REF 26	LAST 1016	6751	5 164 1		INDEX	LCC	
0593			6751	0 0001 0		TC	1	

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P0594 SECTION 3 - ADD/SUBTRACT PACKAGE.

R0595 THE FOLLOWING OPERATIONS ARE PROVIDED FOR ADDING TO AND SUBTRACTING FROM THE MULTI-PURPOSE ACCUMULATOR
 P0597 MPAC:

R0598	1.	CAD	DOUBLE PRECISION ADD.
R0599	2.	DSL	DOUBLE PRECISION SUBTRACT.
R0600	3.	PCSU	DOUBLE PRECISION SUBTRACT FROM.
R0601	4.	TAD	TRIPLE PRECISION ADD.
R0602	5.	VAD	VECTOR ADD.
R0603	6.	VSU	VECTOR SUBTRACT.
R0604	7.	PVSU	VECTOR SUBTRACT FROM.

R0605 THE INTERPRETIVE OVERFLOW INDICATOR OVFIND IS SET NON-ZERO IF OVERFLOW OCCURS IN ANY OF THE ABOVE.

0607	REF	37	LAST	994	6752	3	4735	1	VSU	CAD	BIT15	CHANGES 0 TO DCS.
0608					6753	1	6755	1		TCF	+2	
0609	REF	9	LAST	825	6754	3	4355	0	VAD	CAD	PRIC30	CHANGES C TO DCA.
0610	REF	41	LAST	1016	6755	26	116	0		ADS	ACIRWD	
0611					6756	0	0016	1		EXTEND		
0612	REF	42	LAST	1018	6757	5	0116	1		INDEX	ADDRWD	
0613	REF	2	LAST	382	6758	00	003	1		READ	HISCALAR	DCA 2 OR DCS 2
0614	REF	390	LAST	1017	6761	23	160	1		CAS	MPAC +3	
0615					6762	1	0106	1		EXTEND		CHECK OVERFLOW.
0616					6763	1	6765	1		BZF	+2	
0617	REF	1			6764	1	7217	1		TC	OVERFLW	
0618					6765	1	0006	1		EXTEND		
0619	REF	43	LAST	1018	6766	5	0116	1		INDEX	ADDRWD	
0620	REF	2	LAST	213	6767	11	0015	1		READ	CHANS	DCA 4 OR DCS 4
0621	REF	400	LAST	1018	6770	20	162	1		CAS	MPAC +5	
0622					6771	2	0006	1		EXTEND		
0623					6772	1	6774	1		BZF	+2	
0624	REF	1			6773	0	7014	0		TC	OVERFLWZ	
0625					6774	0	0006	1		EXTEND		
0626	REF	44	LAST	1018	6775	5	0116	1		INDEX	ADDRWD	
0627	REF	15	LAST	725	6776	00	001	0		READ	LCFAN	DCA 0 OR DCS 0
0628	REF	1			6777	1	7003	1		TCF	ENDVXV	
0629					7000	0	0006	1	CAD	EXTEND		
0630	REF	45	LAST	1018	7001	5	0116	1		INDEX	ADDRWD	
0631					7002	3	0001	0		TCF	0	
0632	REF	401	LAST	1018	7003	20	155	1	ENDVXV	CAS	MPAC	VXV FINISHES HERE.
0633					7004	0	0006	1		EXTEND		
0634	REF	10	LAST	1014	7005	1	6764	1		BZF	DANZIC	

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0635	PFF	1		7 06	0 7 22 1	SETQVF	TC	OVERFLOW
0636	PFF	11	LAST 1018	7 07	1 6164 1	TCF	DANZIC	

L INTERPRETER

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0637				7010	0 0006 1	CSU	EXTEND		
0639	REF 46	LAST 1018		7011	5 0116 1		INDEX	ADDRWD	
0639				7012	4 0001 1		CCS	0	
0640	REF 2	LAST 1018		7013	1 7013 1		TCF	ENCVXV	
0641	REF 183	LAST 992		7014	54 001 1	OVERFLWZ	TS	L	ENTRY FOR THIRD COMPONENT.
0642	REF 18	LAST 853		7015	3 4756 1		CAF	FIVE	
0643				7016	1 7021 1		TCF	+3	
0644	REF 184	LAST 1020		7017	54 001 1	OVERFLWY	TS	L	ENTRY FOR SECOND COMPONENT.
0645	REF 30	LAST 972		7020	3 6250 0		CAF	THREE	
0646	REF 185	LAST 1020		7021	56 0 1 0		XCH	L	
0647	REF 320	LAST 1016		7022	56 000 1	OVERFLOW	INDEX	A	ENTRY FOR 1ST COMP OR OP (L=01.
0648	REF 2	LAST 916		7023	4 4734 1		CS	LIMITS	PICK UP FCSMAX OR NFGMAX.
0649	REF 2	LAST 882		7024	54 130 1		TS	BLF	
0650				7025	3 0006 1		EXTEND		
0651	REF 430	LAST 1020		7026	24 000 1		AUG	A	FORCE OVERFLOW.
0652	REF 186	LAST 1020		7027	50 001 0		INDEX	L	
0653	REF 402	LAST 1018		7030	26 155 1		AES	MPAC +1	
0654				7031	54 007 1		TS	7	
0655	REF 187	LAST 994		7032	3 4755 1		CAF	ZERO	
0656	REF 83	LAST 1020		7033	6 0130 0		AC	BLF	
0657	REF 137	LAST 1020		7034	50 0 1 0		INDEX	L	
0658	REF 403	LAST 1020		7035	26 154 0		AES	MPAC	
0659				7036	54 007 1		TS	7	
0660	REF 259	LAST 1017		7037	0 0002 0		TC	0	NO OVERFLOW EXIT.
0661	REF 1			7040	1 7155 0		TCF	SETOVF2	SET OVFLND AND EXIT.
0662				7041	0 0006 1	BVSU	EXTEND		
0663	REF 47	LAST 1020		7042	5 0116 1		INDEX	ADDRWD	
0664				7043	3 0003 1		CCA	2	
0665	REF 404	LAST 1020		7044	52 160 1		DXCH	MPAC +3	
0666				7045	0 0006 1		EXTEND		
0667				7046	4 0001 1		CCCM		
0668	REF 405	LAST 1020		7047	20 160 1		DAS	MPAC +3	
0669				7050	0 0006 1		EXTEND		
0670				7051	1 7052 1		BZF	+2	
0671	REF 2	LAST 1018		7052	0 7017 0		TC	OVERFLWY	
0672				7053	0 0006 1		EXTEND		
0673	REF 48	LAST 1020		7054	5 0116 1		INDEX	ADDRWD	
0674				7055	3 0005 1		CCA	4	
0675	REF 406	LAST 1020		7056	52 162 0		DXCH	MPAC +5	
0676				7057	0 0006 1		EXTEND		
0677				7060	4 0001 1		CCCM		
0678	REF 407	LAST 1020		7061	20 162 0		DAS	MPAC +5	
0679				7062	0 0006 1		EXTEND		
0680				7063	1 7065 1		PZF	+2	
0681	REF 2	LAST 1018		7064	0 7014 0		TC	OVERFLWZ	

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0682				7065	0104	1	RESU	EXTEND
1693	REF	47	LAST 112	7066	5 0116	1		INDEX ADDRWD
0684				7067	3 0101	0		PCA 0
1695	REF	48	LAST 1120	7070	52 155	1		EXCH MFAC
1686				7071	3 0116	1		EXTEND
0687				7072	4 0001	1		DCCM
1688	REF	2	LAST 1120	7073	1 7013	1		TCF ENCVXV

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PD689 TRIPLE PRECISION ADD ROUTINE.

0690			7074	7 0006 1	TAC	EXTEND	
0691	REF 5	LAST 1021	7075	5 0116 1		INDEX	ADDRWD
0692			7076	3 0002 0		BCA	1
0693	REF 409	LAST 1021	7077	20 156 1		CAS	MFAC +1
0694	REF 51	LAST 1022	7100	50 116 1		INDEX	ADDRWD
0695			7101	6 0100 1		AD	0
0696	REF 410	LAST 1022	7102	6 0154 1		AD	MFAC
0697	REF 411	LAST 1022	7103	54 154 0		TS	MFAC
0698	REF 12	LAST 1019	7104	1 6 64 1		TCF	DANZIC
0699	REF 1		7105	1 7216 1		TCF	SETOVF

ADD MINOR PARTS FIRST.

SET OVFLND IF SUCH OCCURS.

L INTERPRETER

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P0700 ARITHMETIC SUBROUTINES ROUTINED IN FIXED-FIXED.

R0701 1. DMSLP DOUBLE PRECISION MULTIPLY. MULTIPLY THE CONTENTS OF MPAC,+1 BY THE DP WORD WHOSE ADDRESS
 R0703 IS IN ADDRWD AND LEAVE A TRIPLE PRECISION RESULT IN MPAC.
 R0705 2. DOUNQUE COUNT THE TRIPLE PRECISION CONTENTS OF MPAC TO DOUBLE PRECISION.
 R0707 3. DOTSUB TAKE THE DOT PRODUCT OF THE VECTOR IN MPAC AND THE VECTOR WHOSE ADDRESS IS IN ADDRWD
 R0709 AND LEAVE THE TRIPLE PRECISION RESULT IN MPAC.
 R0711 4. PCLY USING THE CONTENTS OF MPAC AS A DP ARGUMENT, EVALUATE THE POLYNOMIAL WHOSE DEGREE AND
 R0712 COEFFICIENTS IMMEDIATELY FOLLOW THE TC PCLY INSTRUCTION (SEE ROUTINE FOR DETAILS.)

0714	REF 26	LAST 1020	7114	50 112 0	DMP	INDEX	0	BASIC SUBROUTINE FOR USE BY PINEALL, ETC
0715			7117	3 000 1		CAF	0	AFRES OF ARGUMENT FOLLOWS TO EMP.
0716	REF 261	LAST 1023	7110	24 0 0		INCR	0	
0717	REF 52	LAST 1022	7111	54 116 0	-1	TS	ADDRWD	(PRICIPLE FOR SETTING ADDRWD.)
0718	REF 5	LAST 1022	7112	50 116 1	DMSLP	INDEX	ADDRWD	GET MINOR PART OF OPERAND AT C(ADDRWD).
0719			7113	3 000 1		CA	1	
0720	REF 412	LAST 1022	7114	54 156 1		TS	MPAC +2	THIS WORKS FOR SQUARING MPAC AS WELL.
0721	REF 183	LAST 1020	7115	3 4755 1		CAF	ZERO	SET MPAC +1 TO ZERO SO WE CAN ACCUMULATE
0722	REF 413	LAST 1023	7116	56 155 1		XCH	MPAC +1	THE PARTIAL PRODUCTS WITH CAS
0723	REF 0	LAST 991	7117	54 135 1		TS	MPTEMP	INSTRUCTIONS.
0724			7120	0 000 1		EXTEND		
0725	REF 414	LAST 1023	7121	7 0156 1		MP	MPAC +2	MINOR OF MPAC X MINOR OF C(ADDRWD).
0726	REF 415	LAST 1023	7122	56 156 1		XCH	MPAC +2	DISCARD MINOR PART OF ABOVE RESULT AND
0727			7123	0 000 1		EXTEND		FORM MAJOR OF MPAC X MINOR OF C(ADDRWD).
0728	REF 416	LAST 1023	7124	7 0154 1		MP	MPAC	
0729	REF 417	LAST 1023	7125	20 156 1		CAS	MPAC +1	GUARANTEED NO OVERFLOW.
0730	REF 54	LAST 1023	7126	50 116 1		INDEX	ADDRWD	GET MAJOR PART OF ARGUMENT AT C(ADDRWD).
0731			7127	3 000 1		CA	0	
0732	REF 11	LAST 1023	7131	56 135 1		XCH	MPTEMP	SAVE AND BRING OUT MINOR OF MPAC.
0733			7131	0 000 1	DMSLP	EXTEND		
0734	REF 11	LAST 1022	7132	7 0135 1		MP	MPTEMP	MAJOR OF C(ADDRWD) X MINOR OF MPAC.
0735	REF 418	LAST 1023	7133	20 156 1		CAS	MPAC +1	ACCUMULATE, SETTING A TO PREVENT OVERFLOW.
0736	REF 419	LAST 1023	7134	56 154 1		XCH	MPAC	SETTING MPAC TO 0 OR +-1.
0737			7135	0 000 1		EXTEND		
0738	REF 12	LAST 1023	7136	7 0135 1		MP	MPTEMP	MAJOR OF MPAC X MAJOR OF C(ADDRWD).
0739	REF 420	LAST 1023	7137	20 155 1		CAS	MPAC	GUARANTEED NO OVERFLOW.
0740	REF 262	LAST 1023	7140	0 000 1		TC	0	49 MCT = .573 MS. INCLUDING RETURN.

L INTERPRET

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P0741 ROUND MPAC TO DOUBLE PRECISION, SETTING CVFIND ON THE RARE EVENT OF OVERFLOW.

0743	REF 109	LAST 1023	7141	3 4755 1	ROUND SUB	CAF	Z = 0	SET MPAC +2 = 0 FOR SCALARS AND CHANGE
0744	REF 26	LAST 1013	7142	54 163 1	+1	TS	MODE	MODE TO DP.
0745	REF 421	LAST 1023	7142	54 156 1	VRPLND	XCH	MPAC +2	ELT WE NEEDNT TAKE THE TIME FOR VECTORS.
0746			7144	6 0000 1		DOUBLE		
0747	REF 108	LAST 1020	7145	54 001 1		TS	1	
0748	REF 263	LAST 1023	7146	7 0002 0		TC	Q	
0749	REF 422	LAST 1024	7147	6 0155 1		AD	MPAC +1	ADD ROUNCING BIT IF MPAC +2 WAS GREATER
0750	REF 423	LAST 1024	7148	54 155 1		TS	MPAC +1	THAN .5 IN MAGNITUDE.
0751	REF 264	LAST 1024	7151	7 0002 0		TC	Q	
0752	REF 424	LAST 1024	7152	6 0154 1		AD	MPAC	PROPAGATE INTERFLOW.
0753	REF 425	LAST 1024	7153	54 154 0		TS	MPAC	
0754	REF 265	LAST 1024	7154	7 0002 0		TC	Q	
0755	REF 2	LAST 877	7155	54 121 1	SET CVF2	TS	CVFIND	(RARE).
0756	REF 266	LAST 1024	7156	7 0002 0		TC	Q	

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P0757 THE DOT PRODUCT SUBROUTINE USUALLY FORMS THE DOT PRODUCT OF THE VECTOR IN MPAC WITH A STANDARD SIX
 P0758 REGISTER VECTOR WHOSE ADDRESS IS IN ADDRWD. IN THIS CASE C(CTINC) ARE SET TO 2. VXM, HOWEVER, SETS C(CTINC) TO
 P0761 6 SO THAT DOTSUB DOTS MPAC WITH A COLUMN VECTOR OF THE MATRIX IN QUESTION IN THIS CASE.

P0762	REF	45	LAST	989	7157	3 4752 0	PREPOT	CAF	TWO	PROLOGUE TO SET DOTINC TO 2.
P0764	REF	4	LAST	97	7160	54 136 1		TS	DCTINC	
P0765					7161	0 1106 1	DOTSUB	EXTEND		
P0766	REF	5	LAST	97	7162	22 137 1		EXCH	DCTRET	SAVE RETURN.
P0767	REF	1			7163	0 7112 1		TC	DMPSLR	DCT X COMPONENTS.
P0768	REF	426	LAST	1024	7164	52 150 1		EXCH	MPAC +3	POSITION Y COMPONENT OF MPAC FOR
P0769	REF	427	LAST	1025	7165	52 155 1		EXCH	MPAC	MULTIPLICATION WHILE SAVING RESULT IN
P0770	REF	34	LAST	1020	7166	52 131 0		EXCH	RLF	THREE WORD BUFFER, BUF.
P0771	REF	428	LAST	1026	7167	3 0156 0		CA	MPAC +2	
P0772	REF	45	LAST	1025	7170	54 132 1		TS	RLF +2	
P0773	REF	5	LAST	1025	7171	3 0136 0		CA	DCTINC	ADVANCE ADDRWD TO Y COMPONENT OF
P0774	REF	55	LAST	1023	7172	26 116 0		ADS	ADDRWD	OTHER ARGUMENT.
P0775	REF	2	LAST	1025	7173	0 7112 1		TC	DMPSLR	
P0776	REF	429	LAST	1025	7174	52 156 1		EXCH	MPAC +1	ACCUMULATE PARTIAL PRODUCTS.
P0777	REF	84	LAST	1025	7175	20 132 0		CAS	RLF +1	
P0778	REF	421	LAST	1025	7176	6 0154 1		AD	MPAC	
P0779	REF	37	LAST	1025	7177	6 0130 0		AD	RLF	
P0780	REF	98	LAST	1025	7200	54 130 1		TS	BUF	
P0781					7201	1 7203 0		TCF	+2	
P0782	REF	3	LAST	1024	7202	54 121 1		TS	OVFLW	IF OVERFLOW OCCURS.
P0783	REF	431	LAST	1025	7203	52 162 1		EXCH	MPAC +5	MULTIPLY Z COMPONENTS.
P0784	REF	432	LAST	1025	7204	52 159 1		EXCH	MPAC	
P0785	REF	6	LAST	1025	7205	3 0136 0		CA	DCTINC	
P0786	REF	36	LAST	1025	7206	26 116 0		ADS	ADDRWD	
P0787	REF	3	LAST	1025	7207	0 7112 1		TC	DMPSLR	
P0788	REF	85	LAST	1025	7210	52 132 0	PRODUCT	EXCH	RLF +1	LEAVE FINAL ACCUMULATION IN MPAC.
P0789	REF	433	LAST	1025	7211	20 156 1		CAS	MPAC +1	
P0790	REF	434	LAST	1025	7212	6 0154 1		AD	MPAC	
P0791	REF	74	LAST	1025	7213	6 0130 0		AD	RLF	
P0792	REF	435	LAST	1025	7214	54 154 0		TS	MPAC	
P0793	REF	6	LAST	1025	7215	0 0137 1		TC	DCTRET	
P0794	REF	2	LAST	1019	7216	0 7022 0		TC	OVERFLOW	ON OVERFLOW HERE.
P0795	REF	7	LAST	1025	7217	0 0137 1		TC	DCTRET	

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PC756 POLYPLP PRECISION POLYNOMIAL EVALUATOR

PC797
$$A^N + A^{N-1}X + \dots + A^1X^{N-1} + A^0X^N$$

 PC798 THIS ROUTINE EVALUATES $A^N + A^{N-1}X + \dots + A^1X^{N-1} + A^0X^N$ LEAVING THE CP RESULT IN MFAC ON EXIT.
 R0810

R0811 THE ROUTINE HAS TWO ENTRY

R0812 1. ENTRY THRU PCWPSERS. THE COEFFICIENTS MAY BE EITHER IN FIXED OR FRASABLE, THE CALL IS BY
 R0814 TO PCWPSERS, AND THE RETURN IS TO LCC(TC PCWPSERS)+1. THE ENTERING DATA MUST BE AS FOLLOWS

AJR16	A	SP	LCC-3	ADDRESS FOR REFERENCING COEF TABLE
AJR17	L	SP	N-1	N IS THE DEGREE OF THE POWER SERIES
AJR18	MFAC	CP	X	ARGUMENT

AJR19	LCC+2N	DP	A(I)
AJR10	...		
AJR11	LCC	CP	A(N)

R0812 2. ENTRY THRU POLY. THE CALL TO POLY AND THE ENTERING DATA MUST BE AS FOLLOWS

AJR14	MFAC	CP	X	ARGUMENT
AJR15	LCC	TC	POLY	
AJR16	LCC+1	SP	N-1	
AJR17	LCC+2	CP	A(I)	
AJR18	...			
AJR19	LCC+2N+2	CP	A(N)	RETURN IS TO LCC+2N+4

0821	REF	I	7220	0 0006 1	PCWPSERS	EXTEND	
0822	REF	17	7221	22 141 0		GXCH	POLYRET
0823	REF	I	7222	54 117 1		TS	POLISH
0824	REF	1	7223	22 140 1		LXCH	POLYCNT
			7224	1 7235 0		TCF	POLYCCM
0825	REF	267	7225	50 002 0	POLY	INDEX	Q
0826			7226	3 000 1		CAF	0
0827	REF	2	7227	54 140 0		TS	POLYCNT
0828			7230	6 0000 1		POLYPLP	
0829	REF	268	7231	6 0002 0		AD	Q
0830	REF	18	7232	54 117 1		TS	POLISH
0831	REF	19	7233	6 4756 1		AD	FIVE
0832	REF	2	7234	54 141 1		TS	POLYRET
							STORE RETURN ADDRESS
0833	REF	1	7235	3 6276 1	POLYCCM	CAF	LVRUF
0834	REF	57	7236	54 116 0		TS	ADDPWD
							INCOMING X WILL BE MOVED TO VBLF, SC
							SET ADPPWD SC CMPSUB WILL MVE BY VBLF.
0835			7237	0 1006 1		EXTEND	
0836	REF	19	7240	5 0117 0		INDEX	POLISH
0837			7241	3 0004 0		DCA	3

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0838	REF	426	LAST 1025	7242	52 155 1		DXCH	MFAC	LOAD A(N) INTO MPAC,
0839	REF	45	LAST 1002	7243	52 123 0		DXCH	VPBF	SAVING X IN VLF
0840	REF	1		7244	1 7251 0		TCF	POLY2	
0841	REF	3	LAST 1026	7245	54 140 0	POLYLOOP	TS	POLYCAT	SAVE DECREMENTED LOOP COUNTER
0842	REF	66	LAST 1025	7246	4 4752 1		CS	TWO	
0843	REF	20	LAST 1026	7247	26 117 1		AFS	POLISH	REGRESS COEFFICIENT POINTER
0844	REF	4	LAST 1025	7250	0 7112 1	POLY2	TC	DMPSUB	MULTIPLY BY X
0845				7251	0 0105 1		EXTEND		
0846	REF	21	LAST 1027	7252	5 117 0		JADEX	POLISH	
0847				7253	3 0002 0		CCA	1	ADD IN NEXT COEFFICIENT
0848	REF	427	LAST 1027	7254	2 155 1		CAS	MFAC	USERS RESPONSIBILITY TO ASSURE NO CANCEL
0849	REF	4	LAST 1027	7255	10 140 0		CCS	POLYCAT	
0850	REF	1		7256	1 7245 1		TCF	POLYLOOP	
0851	REF	2	LAST 1026	7257	0 0141 0		TC	POLYCAT	RETURN CALLER

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P0852 MISCELLANEOUS MULTI-PRECISION ROUTINES REQUIRED IN FIXED-FIXED BUT NOT USED BY THE INTERPRETER.

085298	RFF 190	LAST 1024	7267	3 4755 1	DPAGREE	CAF	ZERO	DOUBLE PRECISION ENTRY - ZERO LOW-ORDER WORD
085399	RFF 438	LAST 1027	7261	54 156 1		TS	MPAC +2	
0854	RFF 269	LAST 1026	7262	22 112 0	TPAGREE	LXCH	Q	FORCE SIGN AGREEMENT AMONG THE TRIPLE PRECISION CONTENTS OF MPAC. RETURNING WITH SIGNUM OF THE INPLT IN A.
0855	RFF 3	LAST 987	7263	0 6726 1		TC	BRANCH	
0856	RFF 1		7264	1 7270 1		TCF	ARG+	
0857	RFF 1		7265	1 7310 0		TCF	ARGZERO	
0858	RFF 24	LAST 913	7266	4 4733 1		CS	PCSMAX	IF NEGATIVE.
0859			7267	1 7271 0		TCF	+2	
0860	RFF 25	LAST 1028	7270	3 4733 1	ARC+	CAF	PCSMAX	FORMS +-I.C.
0861	RFF 270	LAST 1028	7271	54 002 1		TS	Q	
0862			7272	0 0176 1			EXTEND	
0863	RFF 231	LAST 1027	7273	24 111 1		AUG	A	
0864	RFF 429	LAST 1028	7274	6 0156 0		AD	MPAC +2	G STILL HAS PCSMAX OR NEGMAX IN IT.
0865	RFF 440	LAST 1028	7275	54 156 1		TS	MPAC +2	
0866	RFF 191	LAST 1028	7276	3 4755 1		CAF	ZERO	
0867	RFF 271	LAST 1028	7277	6 0002 0		AD	Q	
0868	RFF 441	LAST 1028	7300	6 0155 0		AD	MPAC +1	ALWAYS SKIPPING UNLESS ARGZERO.
0869	RFF 442	LAST 1028	7301	54 155 1		TS	MPAC +1	
0870	RFF 192	LAST 1028	7302	3 4755 1		CAF	ZERO	
0871	RFF 272	LAST 1028	7303	6 0002 0		AD	Q	
0872	RFF 443	LAST 1028	7304	6 0154 1		AD	MPAC	RETURN VIA L.
0873	RFF 444	LAST 1028	7305	54 154 0	ARCZERO2	TS	MPAC	
0874	RFF 445	LAST 1028	7306	54 155 1		TS	MPAC +1	
0875	RFF 193	LAST 1024	7307	0 0001 0		TC	L	
0876	RFF 446	LAST 1028	7310	54 156 1	ARCZERO	TS	MPAC +2	SET ALL THREE MPAC REGISTERS TO ZERO.
0877	RFF 1		7311	1 7305 1		TCF	ARGZERO2	

R0878 SHORTMP MULTIPLIES THE TC CONTENTS OF MPAC BY THE SINGLE PRECISION NUMBER ARRIVING IN A.

0880	RFF 13	LAST 1023	7312	54 135 1	SHORTMP	TS	MPTEMP	SC SLESEQUENT CAS WILL WORK.
0881			7313	0 0006 1			EXTEND	
0882	RFF 447	LAST 1028	7314	7 0156 1		MP	MPAC +2	
0883	RFF 448	LAST 1028	7315	54 156 1		TS	MPAC +2	
0884	RFF 193	LAST 1028	7316	3 4755 1	SHORTMP2	CAF	ZERO	
0885	RFF 449	LAST 1028	7317	50 155 0		XCH	MPAC +1	
0886	RFF 1		7320	1 7121 1		TCF	DMPSLE2	

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PO887 DMPNSLR MULTIPLIES THE DP FRACTION ARRIVING IN MPAC BY THE SP
 RJ889 INTEGER ARRIVING IN A. THE DP PRODUCT DEPARTS BOTH IN MPAC AND IN
 RC889 A AND L. NOTE THAT DMPNSLR NORMALLY INCREASES THE MAGNITUDE OF THE
 PC889 CONTENTS OF MPAC. THE CUSTOMER MUST INSURE THAT $B(A) \times B(MPAC, MPAC+1)$
 PD889 AND $B(A) \times B(MPAC)$ ARE LESS THAN 1 IN MAGNITUDE, WHERE B, AS IS OBVIOUS,
 PE889 INDICATES THE ARRIVING CONTENTS.

DB93	REF	1		7321	54 135 1	DMPNSLR	IS	DMPNTMP	
DB94				7322	0 136 1		EXTEND		
DB95	REF	451	LAST 1028	7323	7 135 1		MP	MPAC +1	
DB96	REF	451	LAST 1029	7324	52 135 1		EXCH	MPAC	LOW PRODUCT TO MPAC, HIGH FACTOR TO A
DB97				7325	1 136 1		EXTEND		
DB98	REF	2	LAST 1029	7326	7 135 1		MP	DMPNTMP	
DB99	REF	10	LAST 1028	7327	3 136 1		CA	L	
DB00	REF	452	LAST 1029	7328	25 134 0		ACS	MPAC	COMPLETING THE PRODUCT IN MPAC
DB01				7329	7 136 1		EXTEND		
DB02	REF	453	LAST 1029	7330	3 135 0		DCA	MPAC	BRINGING THE PRODUCT INTO A AND L
DB03	REF	272	LAST 1028	7331	0 137 0		TC	C	

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P0904 MISCELLANEOUS VECTOR OPERATIONS. INCLUDED HERE ARE THE FOLLOWING:

R0905	1.	DOT	DP VECTOR DOT PRODUCT.
R0906	2.	VXV	DP VECTOR CROSS PRODUCT.
R0907	3.	VXSC	DP VECTOR TIMES SCALAR.
R0908	4.	VISC	DP VECTOR DIVIDED BY SCALAR.
R0909	5.	VPPCJ	DP VECTOR PROJECTION. ((MPAC.X)MPAC).
R0910	6.	VXM	DP VECTOR POST-MULTIPLIED BY MATRIX.
R0911	7.	MXV	DP VECTOR PRE-MULTIPLIED BY MATRIX.

0912	REF	1		7334	0 7157 0	DOT	TC	PRFDET	CO THE DOT PRODUCT AND EXIT, CHANGING
0913	REF	194	LAST 1028	7335	3 4755 1	DMODE	CAF	ZERO	THE MODE TO BE SCALAR.
0914	REF	3	LAST 1011	7336	1 6163 0		TCF	NEWMODE	

0915	REF	67	LAST 1027	7337	3 4752 0	MXV	CAF	TWC	SET UP MATINC AND DOTINC FOR ROW
0916	REF	6	LAST 98	7340	54 140 0		TS	MATINC	VECTORS.
0917	REF	1		7341	1 7345 0		TCF	VXM/MXV	GO TO COMMON PORTION.

0918	REF	7	LAST 794	7342	4 4363 1	VXM	CS	TEN	SET MATINC AND DOTINC TO REFER TO MATRIX
0919	REF	7	LAST 1030	7343	54 140 0		TS	MATINC	AS THREE COLUMN VECTORS.
0920	REF	17	LAST 882	7344	3 6245 1		CAF	SIX	

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PQS21 COMMUN PERTICA DE MXV AND VXM.
 0922 RFF 7 LAST 1025 7345 54 134 1 VXM/MXV IS DOTINC
 PQS23 11PAGE (2) RFF TO "VXM/MXV".
 0924 RFF 2 LAST 1024 7346 54 134 1 TC MEACVPUF SAVE VECTOR IN MPAC FOR FURTHER USE.
 0925 RFF 1 7347 54 134 1 TC DOTSLR GO DOT TO GET X COMPONENT OF ANSWER.
 0926 RFF 1 7348 54 134 1 EXTEND
 0927 RFF 34 LAST 1027 7351 52 123 1 BCF VBLF MOVE MPAC VECTOR BACK INTO MPAC, SAVING
 0928 RFF 454 LAST 1029 7352 52 155 1 CXCF MPAC NEW X COMPONENT IN BUF2.
 0929 RFF 12 LAST 1031 7353 52 134 1 CXCF BLF2
 0930 RFF 1 7354 54 134 1 EXTEND
 0931 RFF 27 LAST 1031 7355 54 125 1 CCA VBUF +2
 0932 RFF 455 LAST 1031 7356 52 162 1 CXCF MEAC +3
 0933 RFF 1 7357 54 134 1 EXTEND
 0934 RFF 38 LAST 1031 7358 54 127 1 CCA VBUF +4
 0935 RFF 456 LAST 1031 7359 52 162 1 CXCF MEAC +5
 0936 RFF 8 LAST 1030 7360 54 114 1 CA MATINC INITIALIZE ADDRWD FOR NEXT DOT PRODUCT.
 0937 RFF 58 LAST 1026 7361 54 116 1 ADS ADDRWD PCMS BASE ADDRESS OF NEXT COLUMN(ROW).
 0938 RFF 2 LAST 1031 7362 54 134 1 TC DOTSLR
 0939 RFF 15 LAST 1031 7363 52 123 1 CXCF VBUF MOVE GIVEN VECTOR BACK TO MPAC, SAVING Y
 0940 RFF 457 LAST 1031 7364 52 155 1 CXCF MEAC COMPONENT OF ANSWER IN VBUF +2.
 0941 RFF 4 LAST 1031 7365 52 125 1 CXCF VBLF +2
 0942 RFF 458 LAST 1031 7366 52 155 1 CXCF MEAC +3
 0943 RFF 41 LAST 1031 7367 52 127 1 CXCF VBLF +4
 0944 RFF 459 LAST 1031 7368 52 162 1 CXCF MPAC +5
 0945 RFF 5 LAST 1031 7369 54 114 1 CA MATINC
 0946 RFF 5 LAST 1031 7370 54 116 1 ADS ADDRWD PCMS ADDRESS OF LAST COLUMN OR ROW.
 0947 RFF 3 LAST 1031 7371 54 134 1 TC DOTSLR
 0948 RFF 14 LAST 1031 7372 52 134 1 CXCF BLF2 ANSWER NOW COMPLETE. PUT COMPONENTS INTO
 0949 RFF 461 LAST 1031 7373 52 155 1 CXCF MPAC PROPER MPAC REGISTERS.
 0950 RFF 461 LAST 1031 7374 52 162 1 CXCF MEAC +5
 0951 RFF 4 LAST 1031 7375 52 125 1 CXCF VBLF +2
 0952 RFF 462 LAST 1031 7376 52 155 1 CXCF MPAC +3
 0953 RFF 12 LAST 1022 7377 54 164 1 TC CANZIC EXIT.

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P09F4 VXSC - VECTOR TIMES SCALAR.

0955	REF	27	LAST	1024	7404	1	163	1	VXSC	CCS	MCDF	TEST PRESENT MCDF. SEPARATE ROUTINE WHEN SCALAR IS IN MPAC.
0956	REF	1			7405	1	7433	0	TCF	OVXSC		
0957	REF	2	LAST	1032	7406	1	7423	0	TCF	OVXSC		
0958	REF	1	LAST	1027	7407	0	7112	1	VVXSC	TC	DMPSUB	COMPUTE X COMPONENT AND ROUND IT. PUT Y COMPONENT INTO MPAC SAVING MPAC IN MPAC +3.
0959	REF	1			7410	0	7143	0	TC	VRDUND		
0960	REF	463	LAST	1031	7411	52	160	1	DXCH	MPAC +3		
0961	REF	464	LAST	1032	7412	52	155	1	DXCH	MPAC		
0962	REF	465	LAST	1032	7413	52	160	1	EXCH	MPAC +3		
0963	REF	6	LAST	1032	7414	0	7112	1	TC	DMPSUB	DO SAME FOR Y AND Z COMPONENTS.	
0964	REF	2	LAST	1032	7415	0	7143	0	TC	VRDUND		
0965	REF	466	LAST	1032	7416	52	162	0	DXCH	MPAC +5		
0966	REF	467	LAST	1032	7417	52	155	1	DXCH	MPAC		
0967	REF	468	LAST	1032	7418	52	162	0	EXCH	MPAC +5		
0968	REF	7	LAST	1032	7421	0	7112	1	TC	DMPSUB	EXIT USED TO RESTORE MPAC AFTER THIS TYPE OF ROTATION. CALLED BY VECTOR SHIFT RIGHT, V/SC, ETC.	
0969	REF	3	LAST	1032	7422	0	7143	0	TC	VRDUND		
0970	REF	469	LAST	1032	7423	52	155	1	VFCTATEX	EXCH		MPAC
0971	REF	470	LAST	1032	7424	52	162	0	EXCH	MPAC +5		
0972	REF	471	LAST	1032	7425	52	160	1	EXCH	MPAC +3		
0973	REF	472	LAST	1032	7426	52	155	1	EXCH	MPAC		
0974	REF	14	LAST	1031	7427	1	6064	1	TCF	DANZIG		

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P0975 DP VECTOR PROJECTION ROUTINE.

0976	RFF	2	LAST 1030	7430	0 7157 0	VFFCJ	TC	PPEDCT
0977	RFF	21	LAST 012	7431	4 4751 1		CS	FCUR
0978	RFF	40	LAST 1 31	7432	26 116 0		ADS	ADDPWD

(MPAC.X)MPAC IS COMPUTED AND LEFT IN MPAC. DO NOT AND FALL INTO DVXSC.

R0970 VXSC WHEN SCALAR MOVES IN MPAC AND VECTOR IS AT X.

0981				7433	0 00 5 1	DVXSC	EXTEND	
0981	RFF	472	LAST 1032	7434	2 0155 0		CCA	MPAC
0982	RFF	474	LAST 1032	7435	52 162 0		DXCH	MPAC +3
0983	RFF	8	LAST 1032	7436	0 7112 1		TC	DMPSLR
0984	RFF	4	LAST 1032	7437	0 7143 0		TC	VROUND

SAVE SCALAR IN MPAC +3 AND GET X COMPONENT OF ANSWER.

0985	RFF	68	LAST 1030	7440	3 4752 0		CAF	TWO
0986	RFF	61	LAST 1033	7441	26 116 0		ADS	ADDPWD
0987				7442	0 0106 1		EXTEND	
0988	RFF	475	LAST 1032	7443	3 0160 0		CCA	MPAC +3
0989	RFF	476	LAST 1032	7444	52 155 1		DXCH	MPAC
0990	RFF	477	LAST 1032	7445	52 162 0		DXCH	MPAC +5
0991	RFF	5	LAST 1033	7446	0 7112 1		TC	DMPSLR
0992	RFF	6	LAST 1032	7447	0 7143 0		TC	VROUND

ADVANCE ADPPWD TO Y COMPONENT OF X.

0993	RFF	49	LAST 1032	7450	3 4752 0		CAF	TWO
0994	RFF	62	LAST 1032	7451	26 116 0		ADS	ADDPWD
0995	RFF	478	LAST 1032	7452	52 162 0		DXCH	MPAC +3
0996	RFF	479	LAST 1032	7453	52 155 1		DXCH	MPAC
0997	RFF	480	LAST 1032	7454	52 160 1		DXCH	MPAC +3
0998	RFF	1	LAST 1033	7455	0 7112 1		TC	DMPSLR
0999	RFF	6	LAST 1032	7456	0 7143 0		TC	VROUND

PUT SCALAR BACK INTO MPAC AND SAVE X RESULT IN MPAC +5.

1000	RFF	481	LAST 1032	7457	52 155 1		DXCH	MPAC
1001	RFF	482	LAST 1032	7460	52 162 0		DXCH	MPAC +5
1002	RFF	482	LAST 1032	7461	52 155 1		DXCH	MPAC

TO Z COMPONENT.
BRING SCALAR BACK, PUTTING Y RESULT IN THE PROPER PLACE.

PUT Z COMPONENT IN PROPER PLACE, ALSO POSITIONING X.

1003	RFF	1		7462	1 6524 0		TCF	VCODE
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MODE HAS CHANGED TO VECTOR.

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P1004 THE VECTOR CROSS PRODUCT ROUTINE CALCULATES $(X^1 M^2 - X^2 M^1, X^2 M^3 - X^3 M^2, X^3 M^1 - X^1 M^3)$ WHERE M IS THE VECTOR IN
 R1006 3 2 2 3 1 3 3 1 2 1 1 2
 R1008 MPAC AND X THE VECTOR AT THE GIVEN ADDRESS.

1009			7463	0 006 1	VXV	EXTEND		
1010	RFF 484	LAST 1033	7464	3 0162 1		DCS MPAC +5	FORM UP M3X1, LEAVING M1 IN VEUF.	
1011	RFF 485	LAST 1034	7465	52 155 1		EXCH MPAC		
1012	RFF 49	LAST 1031	7466	52 123 0		EXCH VBLF		
1013	RFF 11	LAST 1033	7467	0 7112 1		TC DMPSUB	BY X1.	
1014			7470	0 006 1		EXTEND		
1015	RFF 486	LAST 1034	7471	4 0162 1		DCS MPAC +3	CALCULATE -X1M2, SAVING X1M3 IN VEUF +2.	
1016	RFF 487	LAST 1034	7472	52 155 1		EXCH MPAC		
1017	RFF 44	LAST 1034	7473	52 125 0		EXCH VBLF +2		
1018	RFF 12	LAST 1034	7474	0 7112 1		TC DMPSUB		
1019	RFF 70	LAST 1033	7475	3 4752 0		CAS TWC	ADVANCE ADDRWD TO X2.	
1020	RFF 63	LAST 1033	7476	26 116 0		ADS ADDRWD		
1021			7477	0 006 1		EXTEND		
1022	RFF 488	LAST 1034	7500	4 0162 0		DCS MPAC +5	PREPARE TO GET -X2M2, SAVING -X1M2 IN	
1023	RFF 489	LAST 1034	7501	52 155 1		EXCH MPAC	MPAC +5.	
1024	RFF 490	LAST 1034	7502	52 162 0		EXCH MPAC +5		
1025	RFF 13	LAST 1034	7503	0 7112 1		TC DMPSUB		
1026			7504	0 006 1		EXTEND		
1027	RFF 45	LAST 1034	7505	3 0123 1		DCS VBLF	GET X2M1, SAVING -X2M3 IN VBLF +4.	
1028	RFF 491	LAST 1034	7506	52 155 1		EXCH MPAC		
1029	RFF 46	LAST 1034	7507	52 127 1		EXCH VBLF +4		
1030	RFF 14	LAST 1034	7508	0 7112 1		TC DMPSUB		
1031	RFF 71	LAST 1034	7511	3 4752 0		CAS TWC	ADVANCE ADDRWD TO X3.	
1032	RFF 64	LAST 1034	7512	26 116 0		ADS ADDRWD		
1033			7513	0 006 1		EXTEND		
1034	RFF 47	LAST 1034	7514	4 0123 0		DCS VBLF	GET -X3M1, ADDING X2M1 TO MPAC +5 TO	
1035	RFF 492	LAST 1034	7515	52 155 1		EXCH MPAC	COMPLETE THE Z COMPONENT OF THE ANSWER.	
1036	RFF 493	LAST 1034	7516	20 162 0		CAS MPAC +5		
1037			7517	0 006 1		EXTEND		
1038			7520	1 7522 1		RZF +2		
1039	RFF 3	LAST 1020	7521	0 7114 0		TC OVERFLOWZ		
1040	RFF 15	LAST 1034	7522	0 7112 1		TC DMPSUB		
1041	RFF 48	LAST 1034	7523	52 125 0		EXCH VBLF +2	MOVE X1M3 TO MPAC +3 SETTING UP FOR X3M2	
1042	RFF 494	LAST 1034	7524	52 160 1		EXCH MPAC +3	AND ADD -X3M1 TO MPAC +3 TO COMPLETE THE	
1043	RFF 495	LAST 1034	7525	52 155 1		EXCH MPAC	Y COMPONENT OF THE RESULT.	
1044	RFF 496	LAST 1034	7526	20 160 1		CAS MPAC +3		
1045			7527	0 006 1		EXTEND		
1046			7530	1 7532 0		RZF +2		

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1047 RFF 3 LAST 1020 7531 0 7117 0 TC OVERFLW

1048 RFF 16 LAST 1034 7532 0 7112 1 TC DMPSLB

1049 RFF 49 LAST 1034 7533 52 127 1 DXCH VBLF +4

1050 RFF 4 LAST 1021 7534 1 7113 1 TCF ENDVXV

GC ADD -X2M3 TO X3V2 TO COMPLETE THE X
COMPONENT (TAIL END OF CAD).

P1051 THE MPACVPUF SUBROUTINE SAVES THE VECTOR IN MPAC IN VBUF WITHOUT Clobbering MPAC.

1053 7535 0 7106 1 MPACVPUF EXTEND CALLED BY MXV, VXM, AND UNIT.

1054 RFF 457 LAST 1034 7536 3 2155 0 GCA MPAC

1055 RFF 51 LAST 1035 7537 52 123 0 DXCH VBLF

1056 7541 0 7106 1 EXTEND

1057 RFF 458 LAST 1035 7541 3 2160 0 GCA MPAC +3

1058 RFF 51 LAST 1035 7542 52 124 0 DXCH VBLF +2

1059 7543 0 7106 1 EXTEND

1060 RFF 459 LAST 1035 7544 3 2162 1 GCA MPAC +5

1061 RFF 52 LAST 1035 7545 52 127 1 DXCH VBLF +4

1062 RFF 274 LAST 1029 7546 0 7102 0 TC

RETURN TO CALLER.

P1063 DOUBLE PRECISION SIGN AND S ROUTINE. ARRIVE WITH INPLT IN A+L. OUTPUT IS IN A +L.

1065 RFF 332 LAST 1028 7547 10 7107 0 ALSICNAC CCS A TEST UPPER PART.

1066 RFF 1 7550 1 7554 0 TCF UPPOS IT IS POSITIVE

1067 RFF 275 LAST 1035 7551 0 7102 0 TC Q ZERO

1068 RFF 1 7552 1 7554 0 TCF UPNEG NEGATIVE

1069 RFF 276 LAST 1035 7553 0 7102 0 TC Q ZERO

1070 RFF 131 LAST 1029 7554 56 7101 0 UPPOS XCH L SAVE DECREMENTED UPPER PART.

1071 RFF 12 LAST 915 7555 6 4735 1 AD HALF

1072 RFF 12 LAST 1035 7556 6 4736 1 AD HALF

1073 RFF 333 LAST 1035 7557 54 7100 0 TS A SKIPS ON OVERFLOW

1074 7560 1 7562 0 TCF +2

1075 RFF 132 LAST 1035 7561 24 7101 0 INCR L RESTORE UPPER TO ORIGINAL VALUE

1076 RFF 193 LAST 1035 7562 56 7101 0 XCH L

1077 RFF 277 LAST 1035 7563 0 7102 0 TC Q SWAP A + L BACK.

1078 RFF 194 LAST 1035 7564 56 7101 0 UPNEG XCH L SAVE COMPLEMENTED + DECREMENTED UPPER PT

1079 RFF 6 LAST 915 7565 6 4735 1 AD NEOMAX

1080 RFF 7 LAST 1035 7566 6 7752 0 AD NEGCAE

1081 RFF 334 LAST 1035 7567 54 7100 0 TS A

1082 7570 1 7572 1 TCF +2

1083 RFF 195 LAST 1035 7571 24 7101 0 INCR L

1084 RFF 196 LAST 1035 7572 56 7101 0 XCH L

1085 7573 4 0 0 0 CCM

1086 RFF 273 LAST 1035 7574 0 7102 0 TC Q

CONT INCREMENT IF NO OVERFLOW.

MAKE NEGATIVE AGAIN.

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P1087 INTERPRETIVE INSTRUCTIONS WHOSE EXECUTION CONSISTS OF PRINCIPALLY CALLING SUBROUTINES.

1088	REF	17	LAST 1035	7575	0 7112 1	DMP1	TC	DMPSUB	DMP INSTRUCTION.
1089	REF	15	LAST 1032	7576	1 6064 1		TCF	DANZIG	
1091	REF	18	LAST 1036	7577	0 7112 1	DMPR	TC	DMPSLB	
1092	REF	1		7578	0 7142 1		TC	PCUNDSUB +1	(C(A) = +D).
1093	REF	16	LAST 1036	7579	1 6064 1		TCF	DANZIG	
1094				7580	0 0006 1	DDV	EXTEND		
1095	REF	65	LAST 1034	7583	5 0116 1		INDEX	ADDRWD	MOVE DIVIDEND INTO BUF.
1096				7584	3 0001 0		DCA	0	
1097	REF	2	LAST 1032	7585	1 7512 1		TCF	BCDV +4	
1098				7586	0 0006 1	BDDV	EXTEND		
1099	REF	66	LAST 1034	7587	5 0116 1		INDEX	ADDRWD	MOVE DIVISOR INTO MPAC SAVING MPAC, THE DIVIDEND, IN BUF.
1100				7588	3 0001 0		ECA	0	
1101	REF	50	LAST 1035	7589	52 155 1		EXCH	MPAC	
1102	REF	91	LAST 1025	7590	52 131 0	+4	EXCH	BUF	
1103	REF	100	LAST 1030	7591	3 4755 1		CAF	ZERO	DIVIDE ROUTINES IN BANK 0.
1104	REF	21	LAST 1016	7592	54 004 1		TS	FBANK	
1105	REF	2	LAST 010	7593	1 2453 1		TCF	DDV/BDDV	
1106	REF	67	LAST 1036	7594	2 0116 1	SETPD	CA	ADDRWD	MUST SET TC WORK AREA, OR EBANK TROLBLE.
1107	REF	22	LAST 1013	7595	54 166 1		TS	PLSHLOC	
1108	REF	1		7596	1 6066 0		TCF	NCIBANKSW	NO FBANK SWITCH REQUIRED.
1109	REF	196	LAST 1036	7597	3 4755 1	TSLOC	CAF	ZERO	SHIFTING ROUTINES LOCATED IN BANK 00.
1110	REF	22	LAST 1036	7598	54 004 1		TS	FBANK	
1111	REF	1		7599	1 2172 0		TCF	TSLOC	
1112	REF	7	LAST 995	7600	3 6077 1	GSHIFT	CAF	LCW7	USED AS MASK AT GENSHIFT. THIS PROCESSES ANY SHIFT INSTRUCTION (EXCEPT TSLOC) WITH AN ADDRESS (ROUTINES IN BANK 0).
1113	REF	23	LAST 1036	7601	54 004 1		TS	FBANK	
1114	REF	1		7602	1 2214 0		TCF	GENSHIFT	

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R1115 THE FOLLOWING IS THE PROLOGUE TO V/SC. IF THE PRESENT MODE IS VECTOR, IT SAVES THE SCALAR AT X IN BLF
 R1117 AND CALLS THE V/SC ROUTINE IN BANK 1. IF THE PRESENT MODE IS SCALAR, IT MOVES THE VECTOR AT X INTO MPAC, SAVING
 R1119 THE SCALAR IN MPAC IN THE BEFORE CALLING THE V/SC ROUTINE IN BANK 0.

1120	REF	28	LAST 1022	7627	10 143 1	V/SC	CCS	MODE		
1121	REF	1		7631	1 7641 1		TCF	OV/SC		MOVE VECTOR INTO MPAC.
1122	REF	2	LAST 1027	7631	1 7641 1		TCF	OV/SC		
1123				7632	0 0006 1	VV/SC	EXTEND			
1124	REF	58	LAST 1036	7633	5 0116 1		INDEX	ADDRWD		
1125				7634	3 0001 0		CCA	0		
1126	REF	92	LAST 1036	7635	52 131 0	V/SC1	EXCH	RUF		IN BOTH CASES, VECTOR IS NOW IN MPAC AND
1127	REF	157	LAST 1036	7636	3 4755 1		CAF	ZERO		SCALAR IN BLF.
1128	REF	24	LAST 1036	7637	54 004 1		TS	FBANK		
1129	REF	1		7641	1 2654 0		TCF	V/SC2		
1130				7641	0 0006 1	OV/SC	EXTEND			
1131	REF	69	LAST 1037	7642	5 0116 1		INDEX	ADDRWD		
1132				7643	3 0003 1		CCA	2		
1133	REF	501	LAST 1036	7644	52 160 1		EXCH	MPAC +3		
1134				7645	0 0006 1		EXTEND			
1135	REF	71	LAST 1037	7646	5 0116 1		INDEX	ADDRWD		
1136				7647	3 0005 1		CCA	4		
1137	REF	502	LAST 1037	7650	52 162 0		EXCH	MPAC +5		
1138	REF	107	LAST 1011	7651	4 4753 0		CS	CAF		CHANGE MODE TO VECTOR.
1139	REF	22	LAST 1037	7652	54 163 1		TS	MODE		
1140				7653	0 0006 1		EXTEND			
1141	REF	71	LAST 1037	7654	5 0116 1		INDEX	ADDRWD		
1142				7655	3 0001 0		CCA	0		
1143	REF	503	LAST 1037	7656	52 155 1		EXCH	MPAC		
1144	REF	1		7657	1 7625 1		TCF	V/SC1		FINISH PROLOGUE AT COMMON SECTION.

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P1145 SIGN AND COMPLEMENT INSTRUCTIONS.

1146	REF	72	LAST 1037	7661	50 116 1	SIGN	INDEX	ADDRWD	CALL COMP INSTRUCTION IF WORD AT X IS
1147				7661	10 100 0		CCS	0	NEGATIVE NON-ZERO.
1148	REF	17	LAST 1036	7662	1 6064 1		TCF	DANZIG	
1149				7663	1 7665 1		TCF	+2	
1150	REF	2	LAST 1035	7664	1 7673 0		TCF	COMP	OF THE COMPLEMENT.
1151	REF	73	LAST 1038	7665	50 116 1		INDEX	ADDRWD	
1152				7666	10 101 1	CCSL	CCS	1	
1153	REF	18	LAST 1038	7667	1 6064 1		TCF	DANZIG	
1154	REF	19	LAST 1038	7670	1 6064 1		TCF	DANZIG	
1155	REF	3	LAST 1038	7671	1 7673 0		TCF	COMP	
1156	REF	20	LAST 1038	7672	1 6064 1		TCF	DANZIG	
1157				7673	0 0006 1	COMP	EXTEND		COMPLEMENT OF MPAC IN EVERY CASE.
1158	REF	5 4	LAST 1037	7674	4 0155 1		DCS	MPAC	
1159	REF	5 5	LAST 1038	7675	52 155 1		EXCH	MPAC	
1160	REF	30	LAST 1037	7676	10 163 1		CCS	MPAC	EITHER COMPLEMENT MPAC +3 OR THE REST OF
1161	REF	1		7677	1 7710 1		TCF	DCCMP	THE VECTOR ACCUMULATOR.
1162	REF	2	LAST 1038	7700	1 7710 1		TCF	DCCMP	
1163				7701	0 0006 1		EXTEND		VECTOR COMPLEMENT.
1164	REF	506	LAST 1038	7702	4 0160 1		DCS	MPAC +3	
1165	REF	507	LAST 1038	7703	52 160 1		EXCH	MPAC +3	
1166				7704	0 0006 1		EXTEND		
1167	REF	508	LAST 1038	7705	4 0162 0		DCS	MPAC +5	
1168	REF	509	LAST 1038	7706	52 162 0		EXCH	MPAC +5	
1169	REF	21	LAST 1038	7707	1 6064 1		TCF	DANZIG	
1170	REF	510	LAST 1038	7710	4 0156 1	DCCMP	CS	MPAC +2	
1171	REF	511	LAST 1038	7711	54 156 1		TS	MPAC +2	
1172	REF	22	LAST 1038	7712	1 6064 1		TCF	DANZIG	

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P1174	1.	SR1 TO SP4	SCALAR SHIFT RIGHT.
P1175	2.	SP1 TO SP4	SCALAR SHIFT RIGHT AND ROUND.
P1176	3.	SL1 TO SL4	SCALAR SHIFT LEFT.
P1177	4.	SL1R TO SL4	SCALAR SHIFT LEFT AND ROUND.
P1178	5.	VSP1 TO VSP8	VECTOR SHIFT RIGHT (ALWAYS ROUNDS).
P1179	6.	VSL1 TO VSL8	VS TOP SHIFT LEFT (NEVER ROUNDS).

P1111	1.	SR	SCALAR SHIFT RIGHT.
P1112	2.	SRP	SCALAR SHIFT RIGHT AND ROUND.
P1113	3.	SL	SCALAR SHIFT LEFT.
P1114	4.	SLP	SCALAR SHIFT LEFT AND ROUND.
P1115	5.	VSR	VECTOR SHIFT RIGHT.
P1116	6.	VSL	VECTOR SHIFT LEFT.

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1211	REF 515	LAST 1035	00,2042	52 155 1	EXCH	MPAC	
1212	REF 17	LAST 1035	00,2043	2 0135 0	CA	MPTEMP	
1213			00,2044	0 0006 1	EXTEND		
1214	REF 157	LAST 1035	00,2045	7 0001 1	MP	L	
1215	REF 516	LAST 1040	00,2046	20 156 1	CAS	MPAC +1	
1216	REF 23	LAST 1038	00,2047	1 0064 1	TCF	DANZIG	

MPAC,+1.

ORIGINAL C(MPAC +1).

GUARANTEED NO OVERFLOW.

R1217 MPAC SHIFT RIGHT AND ROUND SLEECUTINES.

1218	REF 517	LAST 1040	00,2050	3 0156 0	MPACSRND	CA	MPAC +2
1219			00,2051	0 0016 1	EXTEND		
1220	REF 18	LAST 1040	00,2052	7 0135 1	MF	MPTEMP	
1221	REF 518	LAST 1040	00,2053	56 155 0	XCH	MPAC +1	
1222			00,2054	0 0016 1	EXTEND		
1223	REF 19	LAST 1040	00,2055	7 0135 1	MP	MPTEMP	
1224	REF 519	LAST 1040	00,2056	56 155 0	XCH	MPAC +1	
1225	REF 198	LAST 1040	00,2057	6 0001 0	AD	L	

WE HAVE TO DO ALL THREE MULTIPLIES SINCE
MPAC +1 AND MPAC +2 MIGHT HAVE SIGN
DISAGREEMENT WITH A SHIFT RIGHT OF 1.

TRIAL MINCE PART.

1226			00,2060	6 0000 1	VSHR2	DOUBLE	
1227	REF 520	LAST 1040	00,2061	54 156 1	TS	MPAC +2	
1228			00,2062	1 2064 0	TCF	+2	
1229	REF 521	LAST 1040	00,2063	26 155 1	ADS	MPAC +1	

(FINISH VECTOR COMPONENT SHIFT RIGHT
AND ROUND.

GUARANTEED NO OVERFLOW.

1230	REF 199	LAST 1037	00,2064	3 4755 1	CAS	ZERO	
1231	REF 522	LAST 1040	00,2065	54 156 1	TS	MPAC +2	
1232	REF 523	LAST 1040	00,2066	56 154 1	XCH	MPAC	
1233			00,2067	0 0016 1	EXTEND		
1234	REF 20	LAST 1040	00,2070	7 0135 1	MF	MPTEMP	
1235	REF 524	LAST 1040	00,2071	20 155 1	CAS	MPAC	
1236	REF 279	LAST 1035	00,2072	0 0002 0	TC	G	

SETTING TO ZERO SC FOLLOWING CAS WORKS.

AGAIN NO OVERFLOW.

1237	REF 21	LAST 1040	00,2073	3 0135 0	VSHRRND	CA	MPTEMP
1238			00,2074	0 0006 1	EXTEND		
1239	REF 525	LAST 1040	00,2075	7 0155 1	MF	MPAC +1	
1240	REF 526	LAST 1040	00,2076	54 155 1	TS	MPAC +1	
1241	REF 195	LAST 1040	00,2077	56 011 0	XCH	L	
1242	REF 1		00,2100	1 2060 1	TCF	VSHR2	

ENTRY TO SHIFT RIGHT AND ROUND MPAC WHEN
MPAC CONTAINS A VECTOR COMPONENT.

GO ADD ONE IF NECESSARY AND FINISH.

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PI24: ROUTINE FOR SHIFT SCALAR SHIFT LEFT (AND MAYBE ROUND).

1244	REF	13	LAST 1039	00,2101	3 021 1	TSSL	CA	SP	GFT SHIFT COUNT FOR SR.
1245	REF	22	LAST 1040	00,2102	54 135 1	+1	TS	MPTEMP	
1246				00,21 2	0 0006 1	+2	EXT-AD		ENTRY HERE FROM SL FOR SCALARS.
1247	REF	527	LAST 1040	00,2104	3 0156 0		CCA	MPAC +1	SHIFTING LEFT ONE PLACE AT A TIME IS
1248	REF	528	LAST 1041	00,2105	22 156 1		CAS	MPAC +1	FASTER THAN DOING THE WHOLE SHIFT WITH
1249	REF	529	LAST 1041	00,2106	6 0154 1		AD	MPAC	MULTIPLIES ASSUMING THAT FREQUENCY OF
1250	REF	530	LAST 1041	00,2107	6 0154 1		AD	MPAC	SHIFT COUNTS GOES DOWN RAPIDLY AS A
1251	REF	531	LAST 1041	00,2110	54 154 1		TS	MPAC	FUNCTION OF THEIR MAGNITUDE.
1252				00,2111	1 2113 1		TCF	+2	
1253	REF	4	LAST 1025	00,2112	54 121 1		TS	OVFLW	OVERFLOW. (LEAVES OVERFLOW-CORRECTED
1254									RESULT ANYWAY).
1255	REF	23	LAST 1041	00,2113	10 135 1		CCS	MPTEMP	LOOP ON DECREMENTED SHIFT COUNT.
1256	REF	2	LAST 1039	00,2114	1 2112 1		TCF	TSSL +1	
1257	REF	32	LAST 1039	00,2115	10 120 1		CCS	CYP	SEE IF ROUND WANTED.
1258	REF	2	LAST 1036	00,2116	0 7141 1	ROUND	TC	ROUND SUB	YES - ROUND AND EXIT.
1259	REF	24	LAST 1040	00,2117	1 6 64 1		TCF	DANZIG	SL LEAVES A ZERO IN CYP FOR NO ROUND.
1260	REF	25	LAST 1041	00,2120	1 6 164 1		TCF	DANZIG	NO - EXIT IMMEDIATE

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P1261 VECTOR SHIFTING ROUTINES.

1262	REF	2	LAST	233	00,2121	3 4757 0	SHCRTV	CAF	LCW3	SAVE 3 BIT SHIFT COUNT - 1 WITHOUT
1263	REF	33	LAST	1041	00,2122	7 0020 1		MASK	CYC	EDITING CYR.
1264	REF	24	LAST	1041	00,2123	54 135 1		TS	MPTEMP	
1265	REF	34	LAST	1042	00,2124	10 020 1		CCS	CYF	SEE IF LEFT OR RIGHT SHIFT.
1266	REF	1			00,2125	1 2145 1		TCF	VSSL	VECTOR SHIFT LEFT.
1267					00,2126	00176 1	CCT176	CCT	176	USED IN PROCESSED SHIFTS WITH - COUNT.
1268	REF	25	LAST	1042	00,2127	5 1 135 0	VSSR	INDEX	MPTEMP	(ENTRY FROM SF). PICK UP SHIFTING BIT.
1269	REF	50	LAST	1039	00,2130	3 4736 1		CAF	BIT14	MPTEMP CONTAINS THE SHIFT COUNT - 1.
1270	REF	26	LAST	1042	00,2131	54 135 1		TS	MPTEMP	
1271	REF	1			00,2132	0 2072 1		TC	VSHRRND	SHIFT X COMPONENT.
1272	REF	532	LAST	1041	00,2133	52 155 1		EXCH	MPAC	SWAP X AND Y COMPONENTS.
1273	REF	533	LAST	1042	00,2134	52 160 1		EXCH	MPAC +3	
1274	REF	534	LAST	1042	00,2135	52 155 1		EXCH	MPAC	
1275	REF	2	LAST	1042	00,2136	0 2073 1		TC	VSHRRND	SHIFT Y COMPONENT.
1276	REF	535	LAST	1042	00,2137	52 155 1		EXCH	MPAC	SWAP Y AND Z COMPONENTS.
1277	REF	536	LAST	1042	00,2140	52 162 0		EXCH	MPAC +5	
1278	REF	537	LAST	1042	00,2141	52 155 1		EXCH	MPAC	
1279	REF	3	LAST	1042	00,2142	0 2072 1		TC	VSHRRND	SHIFT Z COMPONENT.
1280	REF	1			00,2143	1 7423 1		TCF	VRCATFX	RESTORE COMPONENTS TO PROPER PLACES.

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P12P1 VECTOR SHIFT LEFT - DONE ONE PLACE AT A TIME.

12P2 RFF 27 LAST 1042 00,2144 54 135 1 -1 TS MPTMP SHIFT INC LOOP.

12P3 RFF 548 LAST 1042 00,2145 0 0106 1 VSSL EXTEND

12P4 RFF 548 LAST 1042 00,2146 3 0155 0 DCA MPAC

12P5 RFF 535 LAST 1043 00,2147 2 0155 1 DAS MPAC

12P6 RFF 535 LAST 1043 00,2150 0 0206 1 EXTEND

12P7 RFF 535 LAST 1043 00,2151 1 2153 0 BZF +2

12P8 RFF 3 LAST 1025 00,2152 5 7 22 0 TC OVERFLOW

12P9 RFF 541 LAST 1043 00,2153 0 0206 1 EXTEND

12P10 RFF 541 LAST 1043 00,2154 2 0160 0 DCA MPAC +3

12P11 RFF 541 LAST 1043 00,2155 2 0160 1 DAS MPAC +3

12P12 RFF 541 LAST 1043 00,2156 0 0206 1 EXTEND

12P13 RFF 541 LAST 1043 00,2157 1 2161 1 BZF +2

12P14 RFF 4 LAST 1035 00,2160 0 7 17 0 TC OVERFLOW

12P15 RFF 542 LAST 1043 00,2161 0 0206 1 EXTEND

12P16 RFF 542 LAST 1043 00,2162 3 0162 0 DCA MPAC +5

12P17 RFF 543 LAST 1043 00,2163 2 0162 0 DAS MPAC +5

12P18 RFF 543 LAST 1043 00,2164 0 0206 1 EXTEND

12P19 RFF 543 LAST 1043 00,2165 1 2167 1 BZF +2

13P0 RFF 4 LAST 1034 00,2166 0 7 14 0 TC OVERFLOW

13P1 RFF 2P LAST 1043 00,2167 10 135 1 CCS MPTMP

13P2 RFF 2 LAST 1042 00,2170 1 2144 0 TCF VSSL -1

13P3 RFF 2 LAST 1041 00,2170 1 6064 1 TCF DANZIC

LOOP ON DECREMENTED SHIFT COUNTER.

EXIT.

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P1304 TSIC - TRIPLE SHIFT LEFT AND COUNT. SHIFTS MPAC LEFT UNTIL GREATER THAN .5 IN MAGNITUDE, LEAVING
 P1306 THE COMPLEMENT OF THE NUMBER OF SHIFTS REQUIRED IN X.

1307	REF	29	LAST 1043	00,2172	54 135 1	TSIC2	TS	MPTEMP	START BY ZEROING SHIFT COUNT (IN A NOW).
1308	REF	4	LAST 1028	00,2173	0 6726 1		TC	BRANCH	EXIT WITH NO SHIFTING IF ARGUMENT ZERO.
1309				00,2174	1 2176 1		TCF	+2	
1310	REF	1		00,2175	1 2212 0		TCF	ENDTSIC	STORES ZERO SHIFT COUNT IN THIS CASE.
1311	REF	12	LAST 845	00,2176	0 7262 0		TC	TPAGREE	MAY CAUSE UPSHIFT OF ONE EXTRA PLACE.
1312	REF	544	LAST 1043	00,2177	3 0154 1		CA	MPAC	BEGIN NORMALIZATION LOOP.
1313	REF	1		00,2201	1 2207 1		TCF	TSICTEST	
1314	REF	30	LAST 1044	00,2201	24 135 1	TSICLOOP	INCR	MPTEMP	INCREMENT SHIFT COUNTER.
1315				00,2202	0 0006 1		EXTEND		
1316	REF	545	LAST 1044	00,2203	2 0156 1		DCA	MPAC +1	
1317	REF	546	LAST 1044	00,2204	20 156 1		DAS	MPAC +1	
1318	REF	547	LAST 1044	00,2205	6 0154 1		AC	MPAC	
1319	REF	548	LAST 1044	00,2206	26 154 1		ADS	MPAC	
1320				00,2207	6 0000 1	TSICTEST	DOUBLE		SEE IF (ANOTHER) SHIFT IS REQUIRED.
1321				00,2210	54 000 0		CVSK		
1322	REF	1		00,2211	1 2201 1		TCF	TSICLOOP	YES - INCREMENT COUNT AND SHIFT AGAIN.
1323	REF	31	LAST 1044	00,2212	4 0135 1	ENDTSIC	CS	MPTEMP	
1324	REF	1		00,2213	1 6626 1		TCF	STORE1	STORE SHIFT COUNT AND RETURN TO CANZIG.

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P1325 THE FOLLOWING MULTIPLEX PROCESSES THE GENERAL SHIFT INSTRUCTIONS SR, SRR, SL, AND SLR.
 P1327 THE GIVEN ADDRESS IS DECODED AS FOLLOWS:

P1328 BITS 1-7 SHIFT COUNT (SLR ADDRESS) LESS THAN 125 DECIMAL.
 P1329 BIT 8 POSITIVE SIGN BIT (DETECTS CHANGE IN SIGN IN INDEXED SHIFTS).
 P1331 BIT 9 1 FOR LEFT SHIFT, AND 1 FOR RIGHT SHIFT.
 P1332 BIT 10 1 FOR TERMINAL ROUND ON SCALAR SHIFTS, 0 OTHERWISE.
 P1333 BITS 11-13 0.
 P1334 BIT 14 1.
 P1335 BIT 15 0.

P1336 THE ABOVE CODING IS DONE BY THE VUL SYSTEM.

1337	REF	74	LAST	1038	00,2214	7 7116 0	GENSHIFT MASK	ACDPWD	GET SHIFT COUNT, TESTING FOR ZERO.
1338	REF	335	LAST	1035	00,2215	10 000 0	CCS	A	(ARRIVES WITH C(A) = LOW7).
1339	REF	1			00,2216	1 2224 0	TCF	GENSHIFT2	IF NON-ZERO, PROCEED WITH DECREMENTED CT
1340	REF	32	LAST	904	00,2217	2 4742 1	CAF	BIT8	ZERO SHIFT COUNT. NO SHIFTS NEEDED BUT
1341	REF	75	LAST	1045	00,2218	7 0115 0	MASK	ACDPWD	WE MIGHT HAVE TO ROUND MPAC ON SLR AND
1342	REF	226	LAST	1045	00,2221	10 000 0	CCS	A	SR (SCALAR ONLY).
1343	REF	3	LAST	1041	00,2222	0 7141 1	TC	ROUND SLR	
1344	REF	27	LAST	1043	00,2223	1 5064 1	TCF	DANZIG	
1345	REF	32	LAST	1044	00,2224	54 135 1	GENSHIFT2 TS	MPTEMP	DECREMENTED SHIFT COUNT TO MPTEMP.
1346	REF	35	LAST	992	00,2225	3 4744 1	CAF	BIT8	TEST MEANING OF LOW SEVEN BIT COUNT IN
1347					00,2226	0 0006 1	EXTEND		MPTEMP NOW.
1348	REF	76	LAST	1045	00,2227	7 0116 0	MP	ACDPWD	
1349	REF	1			00,2230	7 625 1	MASK	LOW2	JUMPS ON SHIFT DIRECTION (BIT8) AND
1350	REF	237	LAST	1045	00,2231	50 000 1	INDEX	A	
1351					00,2232	1 2233 0	TCF	+1	ORIGINAL SHIFT DIRECTION (BIT 9).
1352	REF	1			00,2233	1 2332 0	TCF	RIGHT-	NEGATIVE SHIFT COUNT FOR SL OR SLR.
1353	REF	1			00,2234	1 2242 1	TCF	LEFT	SL OR SLR.
1354	REF	1			00,2235	1 2236 1	TCF	LEFT-	NEGATIVE SHIFT COUNT WITH SR OR SRR.

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P1355 GENERAL SHIFT RIGHT.

1356	RFF	31	LAST 1038	00,2236	10 163 1	RIGHT	CCS	MODE	SEE IF VECTOR OR SCALAR.
1357	RFF	1		00,2237	1 2277 0		TCF	GENSCF	
1358	RFF	2	LAST 1046	00,2240	1 2277 1		TCF	GENSCF	
1359	RFF	33	LAST 1045	00,2241	3 0135 0		CA	MPTFMP	SEE IF SHIFT COUNT LESS THAN 140.
1360	RFF	1		00,2242	6 2733 1	VRIGHT2	AD	NEG12	
1361				00,2243	0 2776 1		EXTEND		
1362	RFF	1		00,2244	6 2127 1		BZMF	VSSR	IF SC, BRANCH AND SHIFT IMMEDIATELY.
1363	RFF	9	LAST 1035	00,2245	6 7752 0		AD	NEGONE	IF NOT, REDUCE MPTFMP BY A TOTAL OF 14,
1364	RFF	34	LAST 1046	00,2246	54 135 1		TS	MPTFMP	AND DO A SHIFT RIGHT AND ROUND BY 14.
1365	RFF	199	LAST 1040	00,2247	3 4755 1		CAF	ZERO	THE ROUND AT THIS STAGE MAY INTRODUCE A
1366	RFF	200	LAST 1040	00,2250	54 001 1		TS	L	ONE BIT ERROR IN A SHIFT RIGHT 150.
1367	RFF	545	LAST 1044	00,2251	56 154 1		XCF	MPAC	
1368	RFF	550	LAST 1046	00,2252	56 155 0		XCH	MPAC +1	
1369	RFF	1		00,2253	0 2272 1		TC	SETRCUND	X COMPONENT NOW SHIFTED, SO MAKE UP THE
1370	RFF	551	LAST 1046	00,2254	20 155 1		DAS	MPAC	ROUNDING QUANTITY (C IN A AND C OR +-1
A1371									IN L).
1372	RFF	552	LAST 1046	00,2255	56 157 1		XCF	MPAC +3	REPEAT THE ABOVE PROCESS FOR Y AND Z.
1373	RFF	553	LAST 1046	00,2256	56 160 0		XCH	MPAC +4	
1374	RFF	2	LAST 1046	00,2257	0 2272 1		TC	SETRCUND	
1375	RFF	554	LAST 1046	00,2260	20 160 1		DAS	MPAC +3	NO OVERFLOW ON THESE ADDS.
1376	RFF	555	LAST 1046	00,2261	56 161 1		XCH	MPAC +5	
1377	RFF	556	LAST 1046	00,2262	56 162 1		XCF	MPAC +6	
1378	RFF	3	LAST 1046	00,2263	0 2272 1		TC	SETRCUND	
1379	RFF	557	LAST 1046	00,2264	20 162 0		DAS	MPAC +5	
1380	RFF	35	LAST 1046	00,2265	10 135 1		CCS	MPTFMP	SEE IF DONE, DOING FINAL DECREMENT.
1381	RFF	36	LAST 1046	00,2266	54 135 1		TS	MPTFMP	
1382	RFF	1		00,2267	1 2242 0		TCF	VRIGHT2	
1383				00,2270	04574 1	RTASLC	DEC	.2974 8-1	SQRT CONSTANT
1384	RFF	28	LAST 1045	00,2271	1 6064 1		TCF	DAN7IC	
1385									
1386	RFF	558	LAST 1046	00,2272	6 0000 1	SETRCUND	DOUBLE		MAKES UP ROUNDING QUANTITY FROM ARRIVING
1387	RFF	210	LAST 1046	00,2273	54 156 1		TS	MPAC +2	C(A). L IS ZERO INITIALLY.
1388	RFF	211	LAST 1046	00,2274	3 4755 1		CAF	ZERO	
1389	RFF	211	LAST 1046	00,2275	56 101 0		XCH	L	
1389	RFF	290	LAST 1046	00,2276	0 0000 0		TC	Q	RETURN AND DO THE DAS, RESETTNG L TO C.

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P1207 PROCESS SP AND SFC FOR SCALARS.

1391	REF	37	LAST 1046	0,2277	3 135 0	GENSCR	CA	MPTEMP	SEE IF THE ORIGINAL SHIFT COUNT WAS LESS
1392	REF	2	LAST 1046	0,2277	6 4733 0	+1	AC	MPG12	THAN 140.
1393				0,2277	0 006 1		EXTEND		
1394	REF	1		0,2277	6 2222 0		BZMF	DCSSHFT	DO THE SHIFT IMMEDIATELY IF SC.
1395	REF	5	LAST 1046	0,2277	6 7752 0	+4	AC	MPCCAF	IF NOT, INCREMENT SHIFT COUNT BY 140 AND
1396	REF	38	LAST 1047	0,2277	54 135 1		TS	MPTEMP	SHIFT MPAC RIGHT 14 PLACES.
1397	REF	21	LAST 1046	0,2277	3 4755 1		CAF	ZERO	
1398	REF	550	LAST 1046	0,2277	56 154 1		XCF	MPAC	
1399	REF	560	LAST 1047	0,2277	56 155 1		XCH	MPAC +1	
1400	REF	561	LAST 1047	0,2277	54 156 1		TS	MPAC +2	
1401	REF	49	LAST 1047	0,2277	10 135 1		CCS	MPTEMP	SEE IF FINISHED, DO FINAL DECREMENT.
1402	REF	40	LAST 1047	0,2277	54 135 1		TS	MPTEMP	
1403	REF	3	LAST 1046	0,2277	0 2300 0		TC	GENSCR +1	
1404				0,2277	2265 1	SLOPE-FI	DEC	.5894	SGRT CONSTANT.
1405	REF	54	LAST 1045	0,2277	3 4742 1		CAF	BITIC	FINISHED WITH SHIFT. SEE IF ROUND
1406	REF	77	LAST 1045	0,2277	7 0116 0		MASK	ACDPWD	WANTED.
1407	REF	333	LAST 1045	0,2277	10 010 0		CCS	A	
1408	REF	4	LAST 1045	0,2277	0 7141 1		TC	RCUNSUB	
1409	REF	20	LAST 1046	0,2277	1 6064 1		TCF	DANZIC	DO SC AND/OR EXIT.
1410	REF	41	LAST 1047	0,2277	50 135 0	DCSSHFT	INDEX	MPTEMP	PICK UP SHIFTING BIT.
1411	REF	6	LAST 1042	0,2277	3 4735 1		CAF	BIT14	
1412	REF	42	LAST 1047	0,2277	54 135 1		TS	MPTEMP	
1413	REF	35	LAST 1047	0,2277	3 4742 1		CAF	BITIC	SEE IF TERMINAL ROUND DESIRED.
1414	REF	78	LAST 1047	0,2277	7 0116 0		MASK	ACDPWD	
1415	REF	330	LAST 1047	0,2277	1 000 0		CCS	A	
1416	REF	1		0,2277	1 2231 0		TCF	RIGHTP	YES.
1417	REF	1		0,2277	1 2231 1		TCF	MPACSHR	JUST SHIFT RIGHT.

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P1418 PROCESS THE RIGHT- (SL(R) WITH A NEGATIVE CCNT), LEFT-, AND LEFT OPTIONS.

1421	REF	43	LAST 1047	00,2332	4 0135 1	RIGHT-	CS	MPTEMP	GET ABSOLUTE VALUE - 1 OF SHIFT COUNT
1421	REF	1		00,2333	6 2126 0		AD	OCT176	UNDERSTANDING THAT RITE (PSFLDC-SIGN)
1422	REF	44	LAST 1048	00,2334	54 135 1		TS	MPTEMP	WAS 1 INITIALLY.
1423	REF	1		00,2335	1 2236 0		TCF	RIGHT	DO NORMAL SHIFT RIGHT.
1424	REF	2	LAST 1048	00,2336	4 2126 1	LEFT-	CS	OCT176	SAME PROLOGUE TO LEFT FOR INDEXED RIGHT
1425	REF	45	LAST 1048	00,2337	6 0135 0		AD	MPTEMP	SHIFTS WHOSE NET SHIFT COUNT IS NEGATIVE
1426	REF			00,2340	4 0100 0		COM		
1427	REF	46	LAST 1048	00,2341	54 135 1		TS	MPTEMP	
1428	REF	32	LAST 1046	00,2342	10 163 1	LEFT	CCS	MODE	SINCE LEFT SHIFTING IS SOME ONE PLACE AT
1429	REF	1		00,2343	1 2346 0		TCF	GENSCL	A TIME, NO COMPARISON WITH 14 NEED BE
1430	REF	2	LAST 1048	00,2344	1 2346 0		TCF	GENSCL	DOONE. FOR SCALARS, SEE IF TERMINAL ROUND
1431	REF	3	LAST 1043	00,2345	1 2145 1		TCF	VSSL	DESIRED. FOR VECTORS, SHIFT IMMEDIATELY.
1432	REF	75	LAST 1047	00,2346	4 0116 0	GENSCL	CS	ACCPWD	PUT ROUNDING BIT (BIT 16 OF ADDRWD) INTO
1433	REF			00,2347	0 0006 1		EXTEND		BIT 15 OF CYR WHERE THE ROUNDING BIT OF
1434	REF	47	LAST 893	00,2350	7 4746 1		MP	BIT6	A SHORT SHIFT LEFT WOULD BE
1435	REF	35	LAST 1042	00,2351	54 020 1		TS	CYP	
1436	REF	3	LAST 1041	00,2352	1 2103 0		TCF	TSSL +2	DO THE SHIFT.

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P1437 SCALAR DIVISION INSTRUCTIONS, CDV AND BCDV, ARE EXCLUDED HERE. AT THIS POINT, THE DIVIDEND IS IN MPAC
 R1439 AND THE DIVISOR IN BLF.

1440	FFF	18	LAST 1037	0,2353	4 4752 1	CDV/BCDV	CS	DNF	INITIALIZATION.
1441	FFF	1		0,2354	54 136 1		TS	DVSIGN	+1 FOR POSITIVE QUOTIENT - 0 FOR NEG.
1442	FFF	1		0,2355	54 117 0		TS	OVLOPNCT	DIVIDEND ACRUALIZATION COUNT.
1443	FFF	1		0,2356	54 140 1		TS	MAXOVSW	NEAR-COE DIVIDE FLAG.
1444	FFF	52	LAST 1037	0,2357	10 130 1	CCS	BUF		FORCE BLF POSITIVE WITH THE MAJOR PART
1445	FFF	1		0,2360	1 2516 0	TCF	BLFPOS		NON-ZERO.
1446	FFF	1		0,2361	1 2263 1	TCF	+2		
1447	FFF	1		0,2362	1 2531 1	TCF	BLFNFC		
1448	FFF	562	LAST 1047	0,2363	54 156 1	BLFZERO	TS	MPAC +2	ZEFC THIS.
1449	FFF	13	LAST 1044	0,2364	0 7262 0		TC	TPAGREE	FORCE SIGN AGREEMENT BEFORE OVERFLOW
1450	FFF	562	LAST 1049	0,2365	10 154 0	CCS	MPAC		TEST TC SEE IF MPAC NON-ZERO. (TOO BIG)
1451	FFF	1		0,2366	1 2414 0	TCF	OVF+		MAJOR PART OF DIVIDEND IS POSITIVE NON-0
1452	FFF	1		0,2367	1 2371 1	TCF	+2		
1453	FFF	2	LAST 1045	0,2370	1 2413 1	TCF	OVF+ -1		MAJOR PART OF DIVIDEND IS NEG. NON-ZERO
1454	FFF	54	LAST 1049	0,2371	56 131 1	XCF	BLF +1		SHIFT DIVIDEND AND DIVISOR LEFT 14.
1455	FFF	55	LAST 1049	0,2372	56 130 0	XCF	BUF		
1456	FFF	544	LAST 1049	0,2373	56 155 0	XCF	MPAC +1		
1457	FFF	565	LAST 1049	0,2374	56 154 1	XCF	MPAC		
1458	FFF	96	LAST 1049	0,2375	10 130 1	CCS	BLF		TRY AGAIN ON FORMER MINOR PART.
1459	FFF	1		0,2376	1 2422 0	TCF	BLF+		
1460	FFF	1		0,2377	1 2411 1	TCF	+2		OVERFLOW ON ZERO DIVISOR.
1461	FFF	1		0,2400	1 2416 1	TCF	BLF-		
1462	FFF	566	LAST 1049	0,2401	4 154 0	CS	MPAC		SIGN OF MPAC DETERMINES SIGN OF RESULT.
1463	FFF	1		0,2402	0 1006 1	SGNDVCF	EXTEND		
1464	FFF	1		0,2403	6 2405 1	BZMF	+2		
1465	FFF	2	LAST 1049	0,2404	24 136 0	INCR	DVSIGN		NEGMAX IN MPAC PERHAPS.
1466	FFF	26	LAST 1028	0,2405	3 4733 1	DVCF	CAF	PCSMAX	ON DIVISION OVERFLOW OF ANY SORT, SET
1467	FFF	567	LAST 1049	0,2406	54 154 0	TS	MPAC		SET OF MPAC TO +PCSMAX.
1468	FFF	1		0,2407	0 2640 0	TC	FINALCV +3		
1469	FFF	109	LAST 1049	0,2410	3 4753 1	CAF	CAF		SET OVERFLOW INDICATOR AND EXIT.
1470	FFF	5	LAST 1041	0,2411	54 121 1	TS	OVFINC		
1471	FFF	20	LAST 1047	0,2412	0 6264 0	TC	CANZIC		
1472	FFF	3	LAST 1049	0,2413	24 136 0	-1	INCR	DVSIGN	
1473	FFF	57	LAST 1049	0,2414	4 0131 0	OVF+	CS	BUF +1	LOAD LOWER ORDER PART OF DIVISOR.
1474	FFF	1		0,2415	1 2402 1	TCF	SGNDVCF		GET SIGN OF RESULT.
1475	FFF	1		0,2416	0 0006 1	BUF-	EXTEND		IF BLF IS NEGATIVE, COMPLEMENT IT AND
1476	FFF	58	LAST 1049	0,2417	4 131 0	CCS	BUF		MAINTAIN DVSIGN FOR FINAL QUOTIENT SIGN.
1477	FFF	98	LAST 1049	0,2420	52 121 0	XCF	BLF		
1478	FFF	4	LAST 1049	0,2421	24 136 0	INCR	DVSIGN		NEW -0.

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1479	REF 568	LAST 1049	00,2422	1 154 1	BLF+	CCS	MPAC	FORCE MPAC POSITIVE, CHECKING FOR ZERO
1480	REF 1		00,2423	1 2437 1		TCF	MPAC+	DIVIDEND IN THE PROCESS.
1481			00,2424	1 2426 1		TCF	+2	
1482	REF 1		00,2425	1 2443 1		TCF	MPAC-	
1483	REF 569	LAST 1050	00,2426	10 155 1		CCS	MPAC +1	
1484	REF 2	LAST 1050	00,2427	1 2427 1		TCF	MPAC+	
1485	REF 31	LAST 1049	00,2430	1 6064 1		TCF	DANZIG	EXIT IMMEDIATELY ON ZERO EVIDENCE.
1486	REF 2	LAST 1050	00,2431	1 2433 1		TCF	MPAC-	
1487	REF 32	LAST 1050	00,2432	1 6064 1		TCF	DANZIG	
1488			00,2433	0 0006 1	MPAC-	EXTEND		FORCE MPAC POSITIVE AS BLF IN BLF-.
1489	REF 570	LAST 1050	00,2434	4 0155 1		CCS	MPAC	
1490	REF 571	LAST 1050	00,2435	52 155 1		EXCH	MPAC	
1491	REF 5	LAST 1049	00,2436	24 136 0		INCR	DIVISION	NOW +1 OR -0.

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1492	REF 572	LAST 1051	00,2437	4 0154 0	MPAC+	CS	MPAC	CHECK FOR DIVISION OVERFLOW. IF THE MAJOR PART OF THE DIVIDEND IS LESS THAN THE MAJOR PART OF THE DIVISOR BY AT LEAST TWO, WE CAN PROCEED IMMEDIATELY WITHOUT NORMALIZATION PRODUCING A DVMAX. USED IN SQRTSL9.
1493	REF 10	LAST 1047	00,2440	6 7752 0		AD	NEGONE	
1494	REF 10	LAST 1049	00,2441	6 0130 0		AD	PLF	
1495	REF 240	LAST 1047	00,2442	10 00 0		CCS	A	
1496	REF 1		00,2443	1 2515 1		TCF	DVNORM	
1497			00,2444	67101 0	-1/2+2	CST	60001	
1498			00,2445	1 2446 1		TCF	+1	IF THE ABOVE DOES NOT HOLD, FORCE SIGN AGREEMENT IN NUMERATOR AND DENOMINATOR TO FACILITATE OVERFLOW AND NEAR-ONE CHECKING.
1499	REF 14	LAST 1035	00,2446	3 4736 1		CAF	HALF	
1500			00,2447	6 0130 1		DOUBLE		
1501	REF 572	LAST 1051	00,2448	6 0155 1		AD	MPAC +1	
1502	REF 574	LAST 1051	00,2451	54 155 1		TS	MPAC +1	
1503	REF 272	LAST 1047	00,2452	2 4755 1		CAF	ZERO	
1504	REF 27	LAST 1049	00,2453	6 4733 1		AD	PCSMAX	
1505	REF 575	LAST 1051	00,2454	26 154 0		ADS	MPAC	
1506	REF 15	LAST 1051	00,2455	3 4736 1		CAF	HALF	SAME FOR BUF.
1507			00,2456	6 0130 1		DOUBLE		
1508	REF 101	LAST 1051	00,2457	6 0131 1		AD	BUF +1	
1509	REF 112	LAST 1051	00,2460	54 141 0		TS	PLF +1	
1510	REF 283	LAST 1051	00,2461	3 4755 1		CAF	ZERO	
1511	REF 26	LAST 1051	00,2462	6 4733 1		AD	PCSMAX	
1512	REF 13	LAST 1051	00,2463	26 150 1		ADS	PLF	
1513	REF 576	LAST 1051	00,2464	4 0154 0		CS	MPAC	CHECK MAGNITUDE OF SIGN-CORRECTED OPERANDS.
1514	REF 14	LAST 1051	00,2465	6 0130 0		AD	BUF	
1515	REF 341	LAST 1051	00,2466	10 000 0		CCS	A	
1516	REF 2	LAST 1051	00,2467	1 2505 1		TCF	DVNORM	
1517	REF 15	LAST 1051	00,2470	0 122 0	LELF2	ADRES	PLF2	
1518	REF 1		00,2471	1 2405 0		TCF	DVOVF	DIVISOR NOT LESS THAN DIVIDEND - CVD.
1519	REF 0	LAST 1049	00,2472	54 140 0		TS	MAXDVSW	IF THE MAJOR PARTS OF THE DIVIDEND AND DIVISOR ARE EQUAL, A SPECIAL APPROXIMATION IS USED (PROVIDED THE DIVISION IS POSSIBLE, OF COURSE).
1520	REF 577	LAST 1051	00,2473	4 155 1		CS	MPAC +1	
1521	REF 105	LAST 1051	00,2474	6 0131 1		AD	BUF +1	
1522			00,2475	0 000 0		EXTEND		
1523	REF 2	LAST 1051	00,2476	6 2405 1		27HF	DVOVF	
1524	REF 3	LAST 1051	00,2477	1 2505 1		TCF	DVNORM	IF NO OVERFLOW.

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1525				00,2501	1 2416 1	BUENORM	EXTEND			
1526	REF	2	LAST 1049	00,2501	24 137 1		ALG	CVNORMCT		ADD -1 TO AUGMENT SHIFT COUNT AND SHIFT LEFT ONE PLACE.
1527				00,2502	0 0006 1					
1528	REF	106	LAST 1051	00,2503	3 0131 1		FOA	BUF		
1529	REF	1 7	LAST 1052	00,2504	2 0131 0		CAS	BUF		
1530										
1531	REF	118	LAST 1052	00,2505	3 0131 0	CVNORM	CA	BUF		SEE IF DIVISOR NORMALIZED YET.
1532				00,2506	6 0000 1		CCUBLF			
1533	REF	1		00,2507	54 0000 0		CVSK			
1534				00,2510	1 2500 1		TCF	BUENORM		NO - SHIFT LEFT ONE AND TRY AGAIN.
1535	REF	570	LAST 1051	00,2511	52 155 1		EXCH	MPAC		CALL DIVISOR NORMALIZATION SEQUENCE PRIOR TO DOING THE DIVIDE.
1536	REF	3	LAST 1052	00,2512	50 137 1		INDEX	CVNORMCT		
1537	REF	1		00,2513	0 2505 0		TC	MAXTEST		
1538										
1539	REF	579	LAST 1052	00,2514	54 156 1		TS	MPAC +2		RETURNS WITH DIVISION COUNT AND C(A) = C.
1540	REF	33	LAST 1050	00,2515	1 6064 1		TCF	DANZIG		
1541										
1542	REF	342	LAST 1051	00,2516	10 000 0	BLFPCS	CCS	A		
1543	REF	2	LAST 1049	00,2517	1 2422 0		TCF	BLF+		TO BLF+ IF BLF IS GREATER THAN +1.
1544										
1545	REF	119	LAST 1052	00,2520	4 0131 0		CS	BUF +1		IF BUF IS +1, FORCING SIGN AGREEMENT MAY CAUSE BUF TO BECOME ZERO.
1546	REF	3	LAST 1052	00,2521	0 0006 1		EXTEND			BRANCH IF SIGNS AGREE.
1547				00,2522	6 2422 1		BZMF	BLF+		
1548										
1549	REF	16	LAST 1051	00,2523	3 4736 1		CA	HALF		SIGNS DISAGREE. FORCE AGREEMENT.
1550				00,2524	6 0000 1	+6	CCUBLF			
1551	REF	110	LAST 1052	00,2525	26 131 0		ADS	BUF +1		
1552	REF	204	LAST 1051	00,2526	3 4755 1		CA	ZERO		
1553	REF	111	LAST 1052	00,2527	54 130 1		TS	BUF		
1554	REF	1		00,2530	1 2363 1		TCF	BLFZERO		
1555										
1556										
1557										
1558	REF	343	LAST 1052	00,2531	10 000 0	BLFNCG	CCS	A		
1559	REF	2	LAST 1049	00,2532	1 2416 1		TCF	BLF-		TO BLF- IF BLF IS LESS THAN -1.
1560										
1561	REF	112	LAST 1052	00,2533	3 0131 1		CA	BUF +1		IF BLF IS -1, FORCING SIGN AGREEMENT MAY CAUSE BUF TO BECOME ZERO.
1562				00,2534	0 0006 1		EXTEND			BRANCH IF SIGNS AGREE.
1563	REF	3	LAST 1052	00,2535	6 2416 0		BZMF	BLF-		
1564										
1565	REF	17	LAST 1052	00,2536	4 4736 0		CS	HALF		SIGNS DISAGREE. FORCE AGREEMENT.
1566	REF	2	LAST 1049	00,2537	1 2524 1		TCF	BLFNCG +6		

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P1557 THE FOLLOWING ARE PROLOGUES TO SHIFT THE DIVIDEND ARRIVING IN A AND L BEFORE THE DIVIDE.

1559	REF	14	LAST 1041	0,254	22 021 1	-210	LXCH	SR	SPECIAL PROLOGUE FOR UNIT WHEN THE
1560				0,2541	0 006 1		EXTEND		LENGTH OF THE ARGUMENT WAS NOT LESS THAN
1561	REF	18	LAST 1052	0,2542	7 472 6		MP	HALF	.5. IN THIS CASE, EACH COMPONENT MUST BE
1562	REF	22	LAST 1040	0,2543	56 001 1		XCH	L	SHIFTED RIGHT ONE TO PRECEDE A HALF-UNIT
1563	REF	15	LAST 1052	0,2544	6 0021 1		AC	SR	VECTOR.
1564	REF	20	LAST 1052	0,2545	56 0 1 0		XCH	L	
1565	REF	1		0,2546	1 2571 1		TCF	GENDDV +1	WITH DP DIVIDEND IN A,L.
1566				0,2547	20 001 1		DDCLBL		PROLOGUE WHICH NORMALIZES THE DIVIDEND
1567				0,2550	20 001 1		DDOUBL		WHEN IT IS KNOWN THAT NO DIVISION
1568				0,2551	20 001 1		DDOUBL		OVERFLOW WILL OCCUR.
1569				0,2552	20 001 1		DDCLPL		
1570				0,2553	20 001 1		DDOUBL		
1571				0,2554	20 001 1		DDCLPL		
1572				0,2555	20 001 1		DDOUBL		
1573				0,2556	20 001 1		DDOUBL		
1574				0,2557	20 001 1		DDCLBL		
1575				0,2560	20 001 1		DDOUBL		
1576				0,2561	20 001 1		DDOUBL		
1577				0,2562	20 001 1		DDCLBL		
1578				0,2563	20 001 1		DDOUBL		
1579	REF	58	LAST 1052	0,2564	52 155 1		LXCH	MPAC	
1580	REF	3	LAST 1051	0,2565	10 140 0	MAXTEST	CCS	MAXDVSW	0 IF MAJORS MIGHT BE =, -1 OTHERWISE.
1581				0,2566	06552 0	BIASFI	DEC	.4192 R-1	SQRT CONSTANTS
1582	REF	1		0,2567	1 2642 1		TCF	MAXDV	CHECK TO SEE IF THEY ARE NOW EQUAL.

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PI583 THE FOLLOWING IS A GENERAL PURPOSE DOUBLE PRECISION DIVISION ROUTINE. IT DIVIDES MPAC BY RUF AND LEAVES
RI585 THE RESULT IN MPAC. THE FOLLOWING CONDITIONS MUST BE SATISFIED:

R1586 1. THE DIVISOR (PCLF) MUST BE POSITIVE AND NOT LESS THAN .5.

2. THE DIVIDEND (MPAC) MUST BE POSITIVE WITH THE MAJOR PART OF MPAC STRICTLY LESS THAN THAT OF BLF
(A SPECIAL APPROXIMATION, MAXCV, IS USED WHEN THE MAJOR PARTS ARE EQUAL).

UNDERSTANDING THAT $A/B = Q + S(R/P)$ WHERE $S = 2^{(-14)}$ AND Q AND R ARE QUOTIENT AND REMAINDER, RESPECTIVELY, THE FOLLOWING APPROXIMATION IS OBTAINED BY MULTIPLYING ABOVE AND BELOW BY $C - SD$ AND NEGLECTING TERMS OF ORDER S -SQUARED (POSSIBLY INTRODUCING ERROR INTO THE LOW TWO BITS OF THE RESULT). SIGN AGREEMENT IS UNNECESSARY.

$$\frac{P1597}{P1599} = \frac{A + SB}{C + SD} = \frac{(P - QR)}{(C)} \text{ WHERE } Q \text{ AND } R \text{ ARE QUOTIENT AND REMAINDER OF } \frac{A + SB}{C} \text{ RESPECTIVELY.}$$

1613	RFF 581	LAST 1053	00,2571	52 155 1	GENDDV	DXCH	MPAC	WE NEED A AND B ONLY FOR FIRST IV.
1614			00,2571	0 0005 1	+1	EXTEND		(SPECIAL UNIT PROLOGUE ENTERS HERE).
1615	RFF 113	LAST 1052	00,2572	10 130 1		DV	RLF	A NOW CONTAINS Q AND L, R.
1616	RFF 582	LAST 1 54	00,2573	52 155 1		DXCH	MPAC	
1617	RLF 583	LAST 1054	00,2574	4 0154 0		CS	MPAC	FORM DIVIDEND FOR MINOR PART OF RESULT.
1618			00,2575	0 0106 1		EXTEND		
1619	RFF 114	LAST 1054	00,2576	7 0131 0		MP	RLF +1	
1610	RFF 584	LAST 1054	00,2577	6 0155 0		AC	MPAC +1	OVERFLOW AT THIS POINT IS POSITIVE SINCE
1611			00,2578	54 000 0		DVSK		R IS POSITIVE IN EVERY CASE.
1612			00,2579	1 2606 1		TCF	+5	
1613			00,2572	0 0006 1		EXTEND		OVERFLOW CAN BE REMOVED BY SUBTRACTING C
1614	RFF 115	LAST 1054	00,2573	60 130 0		SU	BUF	(BUF) ONCE SINCE R IS ALWAYS LESS THAN C
1615	RFF 585	LAST 1054	00,2574	24 154 1		INCR	MPAC	IN THIS CASE. INCR COMPENSATES SUBTRACT.
1616	RFF 1		00,2575	1 2610 0		TCF	+DOWN	(SINCE C(A) IS STILL POSITIVE).
1617			00,2576	0 0006 1	+5	EXTEND		C(A) CAN BE MADE LESS THAN C IN MAGNI-
1618	RFF 1		00,2577	6 2620 1		BZMF	-LF	TUDE BY DIMINISHING IT BY C (SINCE C IS
1619								NOT LESS THAN .5) UNLESS C(A) = 0.

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1620			00,2611	0 0006 1	+DOWN	EXTEND		
1621	RIF 116	LAST 1054	00,2611	60 130 0		SU	0LF	IF POSITIVE, REDUCE ONLY IF NECESSARY
1622			00,2612	0 0006 1		EXTEND		SINCE THE COMPENSATING INCR MIGHT CAUSE
1623			00,2613	1 2616 1		RZF	+3	OVERFLOW.
1624			00,2614	1 1116 1		EXTEND		DONT SUBTRACT UNLESS RESULT IS POSITIVE
1625	RIF 1		00,2615	6 2624 1		RZMF	ENIMAXDV	OF ZERO.
1626	RIF 586	LAST 1054	00,2616	24 154 1	+3	INCR	MPAC	KEEP SUBTRACT HERE AND COMPENSATE.
1627	RIF 2	LAST 1049	00,2617	1 2625 0		TCF	FINALDV	
1628			00,2620	0 0006 1	-LP	EXTEND		
1629	RIF 3	LAST 1055	00,2621	1 2630 1		RZF	FINALDV +3	IF ZERO, SET MINOR PART OF RESULT TO ZERO.
1630			00,2622	0 0006 1		EXTEND		
1631	RIF 587	LAST 1055	00,2623	26 154 0		DIM	MPAC	IF NEGATIVE, ADD C TO A, SUBTRACTING ONE
1632	RIF 117	LAST 1055	00,2624	6 0130 0	ENIMAXDV	AC	RUF	TO COMPENSATE. DIM IS OK HERE SINCE THE
								MAJOR PART NEVER GOES NEGATIVE.

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1632				00,2625	22 007 0	FINALEV	ZL		
1634				00,2626	0 006 1		EXTEND		
1635	RFF 118	LAST 1055		00,2627	1 130 1		DV	BLF	
1636	DEF 588	LAST 1056		00,2630	54 155 1	+3	TS	MPAC +1	
1637	RFF 6	LAST 1050		00,2631	10 136 1		CCS	DVSIGN	
1638	RFF 281	LAST 1046		00,2632	0 002 0		TC	Q	
1639	RFF 282	LAST 1056		00,2633	0 002 0		TC	Q	
1640	RFF 283	LAST 1056		00,2634	0 002 0		TC	Q	
1641				00,2635	0 006 1		EXTEND		
1642	RFF 588	LAST 1056		00,2636	4 015 1		CCS	MPAC	
1643	RFF 589	LAST 1056		00,2637	52 155 1		EXCH	MPAC	
1644	RFF 285	LAST 1052		00,2640	3 475 1		CAF	ZERO	
1645	RFF 284	LAST 1056		00,2641	0 002 0		TC	Q	

DO DV TO OBTAIN MINOR PART OF RESULT.

LEAVE RESULT POSITIVE UNLESS C (DVSIGN) = -0.

SO WE ALWAYS RETURN WITH C(A) = 0.

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P166P VECTOR DIVIDED BY SCALAR, V/SC, IS EXECUTED HERE. THE VECTOR IS NOW IN MPAC WITH SCALAR IN BLF.

1670	REF 11	LAST 1049	00,2654	4 4753 0	V/SC2	CS	ONE	INITIALIZE DIVIDEND NORMALIZATION COUNT
1671	REF 4	LAST 1052	00,2655	54 137 1		TS	DVADRMCT	AND DIVISION SIGN REGISTER.
1672	REF 52	LAST 1035	00,2656	54 127 1		TS	VRUF +5	

1673	REF 1		00,2657	0 301 0		TC	VECAGREE	FORCE SIGN AGREEMENT IN VECTOR
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1674	REF 121	LAST 1057	00,2660	52 131 0		EXCH	BUF	
1675	REF 2	LAST 878	00,2661	0 7547 0		TC	ALSIGNAC	SIGN AGREE BUF
1676	REF 122	LAST 1058	00,2662	52 131 0		DXCH	BUF	
1677	REF 123	LAST 1058	00,2663	10 130 1		CCS	BUF	FORCE DIVISOR POSITIVE WITH MAJOR PART
1678	REF 1		00,2664	1 2721 0		TCF	/ELF+	NON-ZERO (IF POSSIBLE).
1679			00,2665	1 2667 0		TCF	+2	
1680	REF 1		00,2666	1 2715 1		TCF	/BUF-	

1681	REF 124	LAST 1058	00,2667	56 131 1		XCH	BUF +1	SHIFT VECTOR AND SCALAR LEFT 14.
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1682	REF 125	LAST 1058	00,2670	56 130 0		XCH	BUF	
1683	REF 594	LAST 1057	00,2671	56 155 0		XCH	MPAC +1	
1684	REF 595	LAST 1058	00,2672	56 154 1		XCH	MPAC	
1685			00,2673	0 0006 1		EXTEND		CHECK FOR OVERFLOW IN EACH CASE.
1686			00,2674	1 2676 0		BZF	+2	
1687	REF 3	LAST 1051	00,2675	1 24 5 0		TCF	DVCVF	

1688	REF 596	LAST 1058	00,2676	56 160 1		XCH	MPAC +4	
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1689	REF 597	LAST 1058	00,2677	56 157 1		XCH	MPAC +3	
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1690			00,2700	0 0006 1		EXTEND		
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1691			00,2701	1 2703 0		BZF	+2	
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1692	REF 4	LAST 1058	00,2702	1 24 5 0		TCF	DVCVF	
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1693	REF 598	LAST 1058	00,2703	56 162 1		XCH	MPAC +6	
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1694	REF 599	LAST 1058	00,2704	56 161 1		XCH	MPAC +5	
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1695			00,2705	0 0006 1		EXTEND		
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1696			00,2706	1 2710 1		BZF	+2	
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1697	REF 5	LAST 1058	00,2707	1 2405 0		TCF	DVCVF	
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1698	REF 126	LAST 1058	00,2710	10 130 1		CCS	BUF	
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1699	REF 2	LAST 1058	00,2711	1 2721 0		TCF	/ELF+	
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1700	REF 6	LAST 1058	00,2712	1 2405 0		TCF	DVCVF	ZERO DIVISOR - OVERFLOW.
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1701	REF 2	LAST 1058	00,2713	1 2715 1		TCF	/BUF-	
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1702	REF 7	LAST 1058	00,2714	1 2405 0		TCF	DVCVF	
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1703			00,2715	0 0006 1	/BUF-	EXTEND		ON NEGATIVE, COMPLEMENT BUF AND MAINTAIN
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1704	REF 127	LAST 1058	00,2716	4 0131 0		CCS	BUF	DIVISION IN VRUF +5.
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1705	REF 128	LAST 1058	00,2717	52 131 0		DXCH	BUF	
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1706	REF 54	LAST 1058	00,2720	24 127 0		INCP	VRUF +5	
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1707			00,2721	1 00 6 1	/HLE+	EXTEND		
1708	REF 129	LAST 1058	00,2722	3 0131 1		CCA	BLF	LEAVE ABS(ORIG DIVISOR) IN BLF2
1709	REF 16	LAST 1051	00,2723	52 134 0		CXCH	BLF2	FOR OVERFLOW TESTING
1710	REF 1		00,2724	1 2722 1		TCF	/NORM	NORMALIZE DIVISOR IN BLF.
1711			00,2725	0 00 06 1	/NORM2	EXTEND		
1712	REF 5	LAST 1058	00,2726	24 137 1		ALG	OVNORMCT	IF LESS THAN .5, AUGMENT OVNORMCT AND
1713			00,2727	4 00 06 1		EXTEND		DOUBLE DIVISOR.
1714	REF 130	LAST 1059	00,2730	3 0131 1		CCA	PUF	
1715	REF 121	LAST 1059	00,2731	20 131 0		CAS	BLF	
1716	REF 132	LAST 1059	00,2732	3 0131 0	/NORM	CA	BLF	SEE IF DIVISOR NORMALIZED.
1717			00,2733	6 0200 1		DOUBLE		
1718			00,2734	54 000 0		OVSK		
1719	REF 1		00,2735	1 2725 1		TCF	/NORM2	DOUBLE AND TRY AGAIN IF NOT.
1720	REF 1		00,2736	0 2750 1		TC	V/SCDV	CC X COMPONENT DIVIDE.
1721	REF 600	LAST 1058	00,2737	52 160 1		CXCH	MPAC +3	SUPPLY ARGUMENTS IN USUAL SEQUENCE.
1722	REF 601	LAST 1059	00,2740	52 155 1		CXCH	MPAC	
1723	REF 602	LAST 1059	00,2741	52 160 1		CXCH	MPAC +3	
1724	REF 2	LAST 1059	00,2742	0 2751 1		TC	V/SCDV	Y COMPONENT.
1725	REF 603	LAST 1059	00,2743	52 162 0		CXCH	MPAC +5	
1726	REF 604	LAST 1059	00,2744	52 155 1		CXCH	MPAC	
1727	REF 605	LAST 1059	00,2745	52 162 1		CXCH	MPAC +5	
1728	REF 3	LAST 1059	00,2746	0 2750 1		TC	V/SCDV	Z COMPONENT.
1729	REF 2	LAST 1042	00,2747	1 7423 1		TCF	VRCTATEX	GO RE-ARRANGE COMPONENTS BEFORE EXIT.

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P1730 SUBROUTINE USED BY V/SO TO DIVIDE VECTOR COMPONENT IN MPAC,+1 BY THE SCALAR GIVEN IN RUF.

1732	REF	55	LAST	1058	00,2750	3 0127 0	V/SO/V	CA	VBUF +5	REFLECTS SIGN OF SCALAR.
1733	REF	7	LAST	1056	00,2751	54 136 1		TS	DVSIGN	
1734	REF	616	LAST	1059	00,2752	10 154 0		CFS	MPAC	FORCE MPAC POSITIVE, EXITING ON ZERO.
1735	REF	1			00,2753	1 2767 1		TCF	/MPAC+	
1736					00,2754	1 2766 0		TCF	+2	
1737	REF	1			00,2755	1 2763 0		TCF	/MPAC-	
1738	REF	607	LAST	1060	00,2756	10 155 1		CFS	MPAC +1	
1739	REF	2	LAST	1060	00,2757	1 2767 1		TCF	/MPAC+	
1740	REF	265	LAST	1056	00,2760	0 0002 0		TC	0	
1741	REF	2	LAST	1060	00,2761	1 2763 0		TCF	/MPAC-	
1742	REF	266	LAST	1060	00,2762	0 0002 0		TC	0	
1743					00,2763	0 0006 1	/MPAC-	EXTEND		USUAL COMPLEMENTING AND SETTING OF SIGN.
1744	REF	613	LAST	1060	00,2764	4 0155 1		DCS	MPAC	
1745	REF	615	LAST	1060	00,2765	52 155 1		CXCF	MPAC	
1746	REF	8	LAST	1060	00,2766	24 136 0		INCF	DVSIGN	
1747	REF	111	LAST	1058	00,2767	4 4753 0	/MPAC+	CS	ONE	INITIALIZE NEAR-CNE SWITCH.
1748	REF	4	LAST	1058	00,2770	54 140 0		TS	MAXDVSW	
1749	REF	610	LAST	1060	00,2771	4 0154 0		CS	MPAC	CHECK POSSIBLE OVERFLOW.
1750	REF	17	LAST	1059	00,2772	6 0133 0		AD	RUF2	UNNORMALIZED INPUT DIVISOR.
1751	REF	244	LAST	1052	00,2773	10 000 0		CFS	A	
1752	REF	1			00,2774	1 2014 1		TCF	DDVCALL	NOT NEAR-CNE
1753					00,2775	1 2777 0		TCF	+2	+0 IS JUST POSSIBLE
1754	REF	8	LAST	1058	00,2776	1 2405 0		TCF	DVCLVF	NO FREE
1755	REF	5	LAST	1060	00,2777	54 140 0		TS	MAXDVSW	SIGNAL POSSIBLE NEAR-CNE CASE
1756	REF	611	LAST	1060	00,2780	4 0155 1		CS	MPAC +1	SEE IF DIVISION CAN BE DONE
1757	REF	18	LAST	1060	00,3001	6 0134 1		AD	BLF2 +1	
1758					00,3002	0 0006 1		EXTEND		
1759	REF	5	LAST	1060	00,3003	6 2405 1		BZMF	DVCLVF	
1760	REF	612	LAST	1060	00,3004	52 155 1	DDVCALL	CXCF	MPAC	CALL PRE-DIVIDE NORMALIZATION.
1761	REF	6	LAST	1059	00,3005	50 137 1		INDEX	DVNDRMCT	
1762	REF	2	LAST	1052	00,3006	1 2565 1		TCF	MAXTEST	

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1762					0,007	32516	SLCPFLC	DEC	.8324	
1764	REF	287	LAST	106	0,010	56 022	VEGAGREE	XCF	G	SAVE G IN A
1765	REF	613	LAST	106	0,011	52 155		DXCH	MPAC	
1766	REF	2	LAST	1068	0,012	1 7547		TC	ALSIGNAG	SIGNAGREF MPAC
1767	REF	614	LAST	1061	0,013	52 155		DXCH	MPAC	
1768	REF	615	LAST	1061	0,014	52 160		DXCH	MPAC +3	
1769	REF	4	LAST	1061	0,015	0 7547		TC	ALSIGNAG	SIGN AGREE MPAC +3
1770	REF	616	LAST	1061	0,016	52 160		DXCH	MPAC +3	
1771	REF	617	LAST	1061	0,017	52 162		DXCH	MPAC +5	
1772	REF	5	LAST	1061	0,018	1 7547		TC	ALSIGNAG	SIGNAGREF MPAC +5
1773	REF	618	LAST	1061	0,019	52 162		DXCH	MPAC +5	
1774	REF	345	LAST	1061	0,020	1 7547		TC	A	

L INTERPRETER

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P1775 THE FOLLOWING ROUTINE EXECUTES THE UNIT INSTRUCTION, WHICH TAKES THE UNIT OF THE VECTOR IN MPAC.

1777	R F	2	LAST 1058	00,3023	0 3010 0	UNIT	TC	VFCAGREE	FORCE SIGN AGREEMENT IN VECTOR
1778	R F	3	LAST 1061	00,3024	0 7535 0		TC	MPACVBUF	SAVE ARGUMENT IN VBUF
1779	R F	206	LAST 1056	00,3025	3 4755 1		CAF	ZERO	PLST SENSE OVERFLOW IN FOLLOWING OCT.
1790	R F	6	LAST 1049	00,3026	56 121 0		XCH	DVFIND	
1791	R F	20	LAST 917	00,3027	54 141 1		TS	TEM1	
1792	R F	1		00,3030	0 2217 1		TC	VQSCLR	PCT MPAC WITH ITSELF.
1783	R F	21	LAST 1062	00,3031	3 0141 0		CA	TEM1	
1784	R F	7	LAST 1062	00,3032	56 121 0		XCH	DVFIND	
1795				00,3033	0 2006 1		EXTEND		
1786				00,3034	1 3036 0		RZF	+2	
1787	R F	10	LAST 1060	00,3035	1 2405 0		TCF	DVCMF	
1788				00,3036	0 0006 1		EXTEND		
1789	R F	619	LAST 1061	00,3037	3 0155 0		CCA	MPAC	LEAVE THE SQUARE OF THE LENGTH OF THE
1790	R F	46	LAST 1016	00,304	56 120 1		INDEX	FIXLOC	ARGUMENT IN LVSQUARE.
1791	R F	1		00,3041	52 043 1		DXCH	LVSQUARE	
1792	R F	1		00,3042	0 3343 0		TC	SGRTSLR	CC TAKE THE NORMALIZED SQUARE ROOT.
1793	R F	62	LAST 1062	00,3043	10 154 0		CCS	MPAC	CHECK FOR UNIT OVERFLOW.
1794				00,3044	1 3051 1		TCF	+5	MPAC IS NOT LESS THAN .5 UNLESS
1795	R F	204	LAST 1053	00,3045	54 001 1		TS	L	
1796	R F	47	LAST 1062	00,3046	50 120 1		INDEX	FIXLOC	
1797	R F	1		00,3047	52 045 1		DXCH	LV	
1798	R F	11	LAST 1062	00,3050	1 2405 0		TCF	DVCMF	INFLT TO SGRTSLR WAS 0.
1799	R F	2	LAST 566	00,3051	4 4317 1		CS	ECURTEFN	SEE IF THE INFLT WAS SO SMALL THE THE
1800	R F	47	LAST 1048	00,3052	6 0135 0		AD	MPTEMP	FIRST TWO REGISTERS OF THE SQUARE WERE 0
1801	R F	346	LAST 1061	00,3053	10 000 0		CCS	A	
1802				00,3054	4 0000 0		CCM		IF SO, SAVE THE NEGATIVE OF THE SHIFT
1803	R F	1		00,3055	1 3133 1		TCF	SMALL	COUNT -150.
1804	R F	1		00,3056	1 3065 0		TCF	LARGE	(THIS IS USUALLY THE CASE.)
1805	R F	1		00,3057	4 4761 1		CS	THIRTEEN	IF THE SHIFT COUNT WAS EXACTLY 14, SET
1806	R F	43	LAST 1062	00,3060	54 135 1		TS	MPTEMP	THE PRE-DIVIDE NORM COUNT TO -130.
1807	R F	621	LAST 1062	00,3061	3 0154 1		CA	MPAC	SHIFT THE LENGTH RIGHT 14 BEFORE STORING
1808	R F	205	LAST 1062	00,3062	54 001 1	SMALL2	TS	L	(SMALL EXITS TO THIS POINT).
1809	R F	207	LAST 1062	00,3063	3 4755 1		CAF	ZERO	
1810	R F	1		00,3064	1 3112 1		TCF	LARGE2	GO TO STORE LENGTH AND PROCEED.
1811	R F	49	LAST 1062	00,3065	1 135 1	LARGE	CCS	MPTEMP	MOST ALL CASES COME HERE.
1812	R F	1		00,3066	1 3074 0		TCF	LARGE3	SEE IF NO NORMALIZATION WAS REQUIRED BY
1813	R F	1		00,3067	4 2024 1		CS	SGDDV	SGRT, AND IF SO, SET UP FOR A SHIFT
1814	R F	50	LAST 1062	00,3070	54 135 1		TS	MPTEMP	RIGHT 1 BEFORE DIVIDING TO PRODUCE
1815				00,3071	0 0006 1		EXTEND		THE DESIRED HALF UNIT VECTOR.
1816	R F	622	LAST 1062	00,3072	3 0155 0		CCA	MPAC	

GAP: ASSEMBLE REVISION 116 OF HSC PROGRAM LUMINARY BY NASA 2021112-071

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L INTERPRET

LSFR'S PAGE NO. 70 E2 S3

1817 OFF 2 LAST 1'62 01,3 73 1 3112 1

TCF LA4CF2

LSEF'S PAGE NO. 71 E3 S3

L INIT OPPTTER

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P1840 IF THE LENGTH OF THE ARGUMENT VECTOR WAS LESS THAN 2 (-28), EACH COMPONENT MUST BE SHIFTED LEFT AT LEAST
 R1851 14 PLACES BEFORE THE DIVIDE. NOTE THAT IN THIS CASE, THE MAJOR PART OF EACH COMPONENT IS ZERO.

1852 REF 52 LAST 1064 0,2132 56 145 1 SMALL TS MET.MD NEGATIVE OF PRE-DIVIDE SHIFT COUNT.

1854 REF 29 LAST 1062 0,2134 3 4755 1 CAF ZF-C SHIFT EACH COMPONENT LEFT 14.

1855 REF 50 LAST 1064 0,2135 56 123 1 XCH VBUF +1

1856 REF 61 LAST 1065 0,2136 56 122 0 XCH VBUF +3

1857 REF 61 LAST 1065 0,2137 56 125 1 XCH VBUF +2

1858 REF 62 LAST 1065 0,214 56 124 0 XCH VBUF +5

1859 REF 62 LAST 1065 0,2141 56 127 0 XCH VBUF +4

1860 REF 64 LAST 1065 0,2142 56 126 1 XCH VBUF +4

1861 REF 52 LAST 1065 0,2143 4 0135 1 CS MET.MD

1862 REF 348 LAST 1064 0,2144 50 010 1 INDEX A

1863 REF 62 LAST 1064 0,2145 3 4735 1 CAF BIT14

1864 REF 63 LAST 1064 0,2146 0 0156 1 EXTEND

1865 REF 13 LAST 1064 0,2147 7 0154 1 MP MPAC

1866 REF 1 LAST 1064 0,2150 1 3062 1 TCF SMALL2

1867 REF 4 LAST 542 4211 THIRTEEN = OCT15

1868 REF 1 LAST 4217 FOURTEEN = OCT16

1869 REF 12 LAST 455 4217 OCT16 = R101

L INT REFETER

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E3 S3

P1870 THE FOLLOWING POLTIME SETS UP THE CALL TO THE DIVIDE ROUTINES.

1871	REF 631	LAST 1065	00,3151	10 154 0	UNITDV	CCS	MPAC	FORCE MPAC POSITIVE IF POSSIBLE, SETTING
1872	REF 1		00,3152	1 317 0		TCF	UMPAC+	DVSIGN ACCORDING TO THE SIGN OF MPAC
1873			00,3153	1 3155 1		TCF	+2	SINCE THE DIVISOR IS ALWAYS POSITIVE
1874	REF 1		00,3154	1 3162 0		TCF	UMPAC-	HERE.
1875	REF 622	LAST 1066	00,3155	10 155 1		CCS	MPAC +1	
1876	REF 2	LAST 1066	00,3156	1 3170 0		TCF	UMPAC+	
1877	REF 288	LAST 1061	00,3157	0 3002 0		TC	Q	EXIT IMMEDIATELY ON ZERO.
1878	REF 2	LAST 1066	00,3160	1 3162 0		TCF	UMPAC-	
1879	REF 289	LAST 1066	00,3161	0 0 02 0		TC	Q	
1880	REF 269	LAST 1065	00,3162	4 4755 0	UMPAC-	CS	ZERO	IF NEGATIVE, SET -C IN DVSIGN FOR FINAL
1881	REF 9	LAST 1060	00,3163	54 136 1		TS	DVSIGN	COMPLEMENT.
1882			00,3164	0 0006 1		EXTEND		
1883	REF 623	LAST 1066	00,3165	4 0155 1		ECS	MPAC	PICK UP ABSOLUTE VALUE OF ARG AND JUMP.
1884	REF 54	LAST 1065	00,3166	50 135 0		INDEX	MPTENF	
1885	REF 3	LAST 1060	00,3167	1 2564 0		TCF	MAXTEST -1	
1886	REF 10	LAST 1066	00,3170	54 136 1	UMPAC+	TS	DVSIGN	SET DVSIGN FOR POSITIVE QUOTIENT.
1887	REF 634	LAST 1066	00,3171	52 155 1		DXCH	MPAC	
1888	REF 55	LAST 1066	00,3172	50 135 0		INDEX	MPTENF	
1889	REF 4	LAST 1066	00,3173	1 2564 0		TCF	MAXTEST -1	

L INTERPRETER

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P18900 MISCELLANEOUS READY OPERATIONS.

1891	REF	1		00,3174	0 3200 1	DSQ	TC	DSOSUR	SQUARE THE DP CONTENTS OF MPAC.
1892	REF	4	LAST 1892	00,3175	1 6164 1		TCF	DANZIG	
1893	REF	22	LAST 1848	00,3176	10 163 1	ARVALAPS	CCS	MODE	ARVAL OF AES INSTRUCTION.
1894	REF	3	LAST 819	00,3177	1 3226 1		TCF	APS	DE APS ON SCALAR.
1895	REF	4	LAST 1067	00,3200	1 3226 0		TCF	AES	
1896	REF	2	LAST 1862	00,3201	0 3217 1	ARVAL	TC	VSCSCL	GET MPAC WITH ITSELF.
1897	REF	34	LAST 1067	00,3212	22 163 0		LXCH	MODE	MODE IS NOW DP (L ZERO AFTER DAS).
1898				00,3213	0 0016 1		EXTEND		
1899	REF	625	LAST 1066	00,3214	3 0155 0		ICA	MPAC	STORE SQUARE OF LENGTH IN WORK AREA.
1900	REF	40	LAST 1064	00,3215	50 121 1		INDEX	FIXLCC	
1901	REF	2	LAST 1062	00,3216	52 142 1		DXCH	LVSQAR	

L INTERPRETER

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P1902 PROGRAM DESCRIPTION- SUBROUTINE SQRT
 R1903 FUNCTIONAL DESCRIPTION-DOUBLE PRECISION SQUARE ROOT ROUTINE
 R1904 THIS PROGRAM TAKES THE SQUARE ROOT OF THE 27 OR 28 MOST SIGNIFICANT BITS IN THE TRIPLE PRECISION SET OF
 P1906 NUMBERS-MPAC,MPAC+1,AND MPAC+2. THE ROOT IS RETURNED DOUBLE PRECISION IN MPAC AND MPAC+1.
 R1909 WARNING- THIS SUBROUTINE USES A TRIPLE PRECISION INPUT. THE PROGRAMMER MUST ASSURE THE CONTENTS OF MPAC+2
 R1911 ESPECIALLY IF THE CONTENTS OF MPAC IS SMALL OR ZERO. FOR DETAILS SEE STO MEMO NC.949.
 R1912 CALLING SEQUENCE- IN INTERPRETIVE MODE I.E., FOLLOWING TO INTERP,SQRT NO ADDRESS IS ALLOWED
 P1914 INPLT SCALING THE BINARY POINT IS ASSUMED TO THE RIGHT OF BIT 15. THE ANSWER IS RETURNED WITH THE SAME SCALING
 R1916 SUPERLINES- GNSCR,MPACSH, SQRTSUP,APORT
 R1917 APORT EXIT MODE- APORTS ON NEGATIVE INPUT -1.2X10⁻⁴ (77775 OCTAL) OR LESS.
 P1919 DISPLAYS FRAMP OCT 1312
 R1920 TO APORT
 R1921 OCT 1312
 R1922 ERRORS - LOCATIONS BUF,OUTEMP,ADDWD ARE USED
 1923 REF 2 LAST 1062 00,3217 0 3343 0 SQRT TC SQRTSLP TAKE THE SQUARE ROOT OF MPAC.
 1924 REF 56 LAST 1066 00,3211 10 135 1 CCS MTEMP RETURNED NORMALIZED SQUARE ROOT. SEE IF
 1925 00,3211 1 3213 0 TCF +2 ANY UN-NORMALIZATION REQUIRED AND EXIT
 1926 REF 35 LAST 1067 00,3212 1 6064 1 TCF DANZIG IF NOT.
 1927 REF 3 LAST 1047 00,3213 6 3733 4 AD NEG12 A RIGHT SHIFT OF MORE THAN 13 COULD BE
 1928 00,3214 0 0116 1 EXTEND REQUIRED IF INPUT WAS ZERO IN MPAC,+1.
 1929 REF 1 00,3215 6 3221 0 EZMF SQRTSHFT COES HERE IN MOST CASES.
 1930 00,3216 22 017 7 ZL IF A LONG SHIFT IS REQUIRED, GO TO
 1931 REF 8 LAST 1048 00,3217 22 116 1 LXCF ADDWD GENERAL RIGHT SHIFT ROUTINES.
 1932 REF 4 LAST 1047 00,3220 1 2203 1 TCF GNSCR +4 ADRWD WAS ZERO TO PREVENT ROUND.
 1933 REF 57 LAST 1068 00,3221 50 135 0 SQRTSHFT INDEX MTEMP SELECT SHIFTING BIT AND EXIT THROUGH
 1934 REF 28 LAST 1018 00,3222 3 4735 1 CAF PIT15 SHIFT ROUTINES.
 1935 REF 58 LAST 1066 00,3223 54 135 1 TS MTEMP
 1936 REF 21 LAST 1066 00,3224 3 4755 1 CAF ZERO TO ZERO MPAC +2 IN THE PROCESS.
 1937 REF 2 LAST 1047 00,3225 1 2036 1 TCF MPACSHR +3
 1938 REF 5 LAST 1044 00,3226 0 6726 1 APS TC BRANCH TEST SIGN OF MPAC AND COMPLEMENT IF
 1939 REF 36 LAST 1068 00,3227 1 6064 1 TCF DANZIG
 1940 REF 37 LAST 1066 00,3230 1 6064 1 TCF DANZIG
 1941 REF 4 LAST 1038 00,3231 1 7673 0 TCF COMP

1 INTERPRET:

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1942 RFF 22 LAST 1033 00,3232 4 4751 1 VDEF
 1943 RFF 23 LAST 1036 00,3233 26 166 1
 1944 RFF 345 LAST 1065 00,3234 1 106 1
 1945 RFF 345 LAST 1065 00,3235 5 166 1
 1946 RFF 345 LAST 1065 00,3236 3 113 1
 1947 RFF 636 LAST 1067 00,3237 52 166 1
 1948 RFF 345 LAST 1065 00,3240 1 106 1
 1949 RFF 24 LAST 1065 00,3241 5 166 1
 1950 RFF 345 LAST 1065 00,3242 3 106 1
 1951 RFF 637 LAST 1065 00,3243 52 166 1
 1952 RFF 2 LAST 1033 00,3244 1 6524 1

CS FFLR
 ACS PUSHLOC
 EXTEND
 INDEX 4
 DCA 2
 CXCH MPAC +3
 EXTEND
 INDEX PUSHLOC
 DCA 1
 CXCH MPAC +5
 TCF VDEF

VECTOR DEFINE - ESSENTIALLY TREATS
 SCALAR IN MPAC AS X COMPONENT, FLUSHES UP
 FOR Y AND THEN AGAIN FOR Z.

1953 RFF 3 LAST 1067 00,3245 1 2217 1 VSO
 1954 RFF 1 LAST 1067 00,3246 1 7335 1

TC VSQSLH
 TCF DMODE

GET MPAC WITH ITSELF.
 MODE IS NOW DP.

1955 RFF 3 LAST 1067 00,3247 5 1006 1 PLSH
 1956 RFF 638 LAST 1065 00,3250 3 1155 1
 1957 RFF 25 LAST 1065 00,3251 50 166 1
 1958 RFF 25 LAST 1065 00,3252 52 106 1

EXTEND
 DCA MPAC
 INDEX PUSHLOC
 CXCH 1

FLUSH DOWN MPAC LEAVING IT LOADED.
 PUSH DOWN FIRST TWO REGISTERS IN EACH

1959 RFF 35 LAST 1067 00,3253 50 163 0
 1960 RFF 5 LAST 1012 00,3254 3 6247 0
 1961 RFF 26 LAST 1065 00,3255 26 166 1

INDEX MODE
 CAF NO. WDS
 ACS PUSHLOC

INCREMENT FLUSHDOWN POINTER.

1962 RFF 26 LAST 1065 00,3256 10 163 1
 1963 RFF 1 LAST 1065 00,3257 1 3272 1
 1964 RFF 39 LAST 1066 00,3260 1 6364 1

CCS MODE
 TCF TFLSH
 TCF DANZIC

FLUSH DOWN MPAC +2.
 DCAF FOR DP.

1965 RFF 3 LAST 1065 00,3261 1 106 1
 1966 RFF 639 LAST 1069 00,3262 3 1160 0
 1967 RFF 27 LAST 1065 00,3263 50 166 1
 1968 RFF 27 LAST 1065 00,3264 51 1775 0
 1969 RFF 27 LAST 1065 00,3265 2 106 1
 1970 RFF 640 LAST 1065 00,3266 3 1162 1
 1971 RFF 28 LAST 1065 00,3267 50 166 0
 1972 RFF 28 LAST 1065 00,3270 51 1777 1
 1973 RFF 28 LAST 1065 00,3271 1 6364 1

EXTEND
 DCA MPAC +3
 INDEX PUSHLOC
 CXCH 1 -4
 EXTEND
 DCA MPAC +5
 INDEX PUSHLOC
 CXCH 0 -2
 TCF DANZIC

ON VECTOR, PUSH DOWN Y AND Z COMPONENTS.

1974 RFF 641 LAST 1065 00,3272 3 1156 0 TPUSH
 1975 RFF 2 LAST 1012 00,3273 1 6557 1

CA MPAC +2
 TCF FADTPUSH +2

1976 RFF 30 LAST 1067 00,3274 50 120 1 PVS
 1977 RFF 10 LAST 1015 00,3275 3 1052 0
 1978 RFF 22 LAST 1027 00,3276 54 117 1
 1979 RFF 5 LAST 1016 00,3277 1 6655 0

INDEX FIXLCC
 CA QPRFT
 TS PCLISH
 TCF GOTO +4

PVS - RETURN IVA QPRFT.

(ASSUME QPRFT POINTS TO FIXLCC ONLY.)

I INTERPRETER

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P1980 THE FOLLOWING SUBROUTINES ARE USED IN SQUARING MPAC, IN BOTH THE SCALAR AND VECTOR SENSE. THEY ARE
 P1982 SPECIAL CASES OF DMSUB AND DCTSUP, PUT IN TO SAVE SOME TIME.

1983	REF 642	LAST 1065	00,3300	3 0155 0	DSQSUB	CA	MPAC +1	SQUARES THE SCALAR CONTENTS OF MPAC.
1984			00,3301	0 0006 1		EXTEND		
1985			00,3302	7 0000 0		SQUARE		
1986	REF 643	LAST 1070	00,3303	54 156 1		TS	MPAC +2	
1987	REF 211	LAST 1068	00,3304	3 4755 1		CAF	ZERO	TERM 2 (CROSS TERM).
1988	REF 644	LAST 1070	00,3305	56 155 0		XCF	MPAC +1	
1989			00,3306	0 0006 1		EXTEND		
1990	REF 645	LAST 1070	00,3307	7 0154 0		MP	MPAC	
1991			00,3310	20 001 1		DDCUEL		AND MAYBE OVERFLOW.
1992	REF 646	LAST 1070	00,3311	20 156 1		DAS	MPAC +1	AND SET A TO NOT OVERFLOW.
1993	REF 647	LAST 1070	00,3312	56 154 1		XCF	MPAC	
1994			00,3313	0 0006 1		EXTEND		
1995			00,3314	7 0000 0		SQUARE		
1996	REF 648	LAST 1070	00,3315	20 155 1		DAS	MPAC	
1997	REF 290	LAST 1066	00,3316	0 0002 0		TC	Q	
1998			00,3317	0 0006 1	VSQSUB	EXTEND		DCTS THE VECTOR IN MPAC WITH ITSELF.
1999	REF 8	LAST 1025	00,3320	22 137 1		DXCF	DCTREF	
2000	REF 2	LAST 1067	00,3321	0 0000 1		TC	DSQSUB	SQUARE THE X COMPONENT.
2001	REF 649	LAST 1070	00,3322	52 160 1		DXCF	MPAC +3	
2002	REF 650	LAST 1070	00,3323	52 155 1		DXCF	MPAC	
2003	REF 137	LAST 1064	00,3324	52 131 1		DXCH	BLF	SO WE CAN END IN DCTSUE.
2004	REF 651	LAST 1070	00,3325	3 0156 0		CA	MPAC +2	
2005	REF 128	LAST 1070	00,3326	54 132 0		TS	PUF +2	
2006	REF 3	LAST 1070	00,3327	0 0000 1		TC	DSQSUB	SQUARE Y COMPONENT.
2007	REF 652	LAST 1070	00,3330	52 156 1		DXCF	MPAC +1	
2008	REF 129	LAST 1070	00,3331	20 132 0		DAS	BLF +1	
2009	REF 653	LAST 1070	00,3332	6 0154 1		AD	MPAC	
2010	REF 140	LAST 1070	00,3333	6 0130 0		AD	BLF	
2011	REF 141	LAST 1070	00,3334	54 130 1		TS	BLF	
2012			00,3335	1 3337 1		TCF	+2	
2013	REF 8	LAST 1062	00,3336	54 121 1		TS	CVFIND	IF OVERFLOW.
2014	REF 654	LAST 1070	00,3337	52 162 0		DXCH	MPAC +5	
2015	REF 655	LAST 1070	00,3340	52 155 1		DXCF	MPAC	
2016	REF 4	LAST 1070	00,3341	7 0000 1		TC	DSQSUB	SQUARE Z COMPONENT.
2017	REF 1		00,3342	1 7210 1		TCF	ENDDOT	END AS IN DCTSUE.

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P2018 DOUBLE PRECISION SQUARE ROOT ROUTINE. TAKE THE SQUARE ROOT OF THE TRIPLE PRECISION (MPAC +2 USED ONLY
 P2020 TH NORMALIZATION) CONTENTS OF MPAC AND LEAVE THE NORMALIZED RESULT IN MPAC (CMPAC) GREATER THAN OR EQUAL TO
 P2022 .5). THE RIGHT SHIFT COUNT (TO LANNORMALIZE) IS LEFT IN MTEMP.

P2023	REF 212	LAST 1070	00,3343	3 4755 1	SQRTSUE	CAF	ZERO	START BY ZEROING RIGHT SHIFT COUNT.
P2024	REF 55	LAST 1068	00,3344	54 135 1		TS	MTEMP	
P2025	REF 535	LAST 1070	00,3345	1 154 0		CCS	MPAC	CHECK FOR POSITIVE ARGUMENT, SHIFTING
P2026	REF 1		00,3346	1 34 5 1		TCF	SMPAC+	FIRST SIGNIFICANT MPAC REGISTER INTO
P2027			00,3347	1 2351 1		TCF	+2	MPAC ITSELF.
P2028	REF 1		00,3348	1 3373 1		TCF	SQRTABG	SEE IF MAG OF ARGUMENT LESS THAN 10(-4).
P2029	REF 657	LAST 1071	00,3351	56 156 0		XCH	MPAC +2	MPAC IS ZERO - SHIFT LEFT 14.
P2030	REF 658	LAST 1071	00,3352	56 155 0		XCH	MPAC +1	
P2031	REF 659	LAST 1071	00,3353	54 154 0		TS	MPAC	
P2032	REF 14	LAST 1069	00,3354	3 4757 0		CAF	SEVEN	AUGMENT RIGHT SHIFT COUNTER.
P2033	REF 60	LAST 1071	00,3355	54 135 1		TS	MTEMP	
P2034	REF 660	LAST 1071	00,3356	10 154 0		CCS	MPAC	SEE IF MPAC NOW POS.
P2035	REF 2	LAST 1071	00,3357	1 3405 1		TCF	SMPAC+	
P2036			00,3360	1 3362 1		TCF	+2	
P2037	REF 1		00,3361	1 3375 1		TCF	ZEROCANS	NEGATIVE BUT LESS THAN 10(-4) IN MAG.
P2038	REF 661	LAST 1071	00,3362	56 155 0		XCH	MPAC +1	ZERO - SHIFT LEFT 14 AGAIN.
P2039	REF 662	LAST 1071	00,3363	54 154 0		TS	MPAC	
P2040	REF 15	LAST 1071	00,3364	2 4757 0		CAF	SEVEN	AUGMENT RIGHT SHIFT COUNTER.
P2041	REF 61	LAST 1071	00,3365	26 135 1		ADS	MTEMP	
P2042	REF 663	LAST 1071	00,3366	10 154 0		CCS	MPAC	
P2043	REF 2	LAST 1071	00,3367	1 3405 1		TCF	SMPAC+	
P2044	REF 291	LAST 1070	00,3370	0 0122 0		TC	Q	SQRT(L) = 0.
P2045	REF 2	LAST 1071	00,3371	1 3375 1		TCF	ZEROCANS	
P2046	REF 1		00,3372	1 3453 1		TCF	FIXRECT	DO NOT LEAVE SQRTSUE WITH -1 IN MPAC.
P2047	REF 350	LAST 1069	00,3373	1 3402 0	SQRTNEC	CCS	A	ARGUMENT IS NEGATIVE, PUT SEE IF SIGN-
P2048	REF 1		00,3374	1 3402 0		TCF	SQRTABPT	CORRECTED ARGUMENT IS LESS THAN 10(-4)
P2049	REF 664	LAST 1071	00,3375	10 155 1		CCS	MPAC +1	IN MAGNITUDE. IF SO, CALL ANSWER ZERO.
P2050	REF 213	LAST 1071	00,3376	3 4755 1	ZEROCANS	CAF	ZERO	FORCE ANSWER TO ZERO HERE.
P2051	REF 2	LAST 1071	00,3377	1 3453 1		TCF	FIXRECT	
P2052	REF 2	LAST 1071	00,3378	1 3402 0		TCF	SQRTABPT	
P2053	REF 3	LAST 1071	00,3379	1 3453 1		TCF	FIXRECT	
P2054	REF 27	LAST 1071	00,3382	52 165 1	SQRTABPT	CXCH	LCC	
P2054.1	REF 1		00,3383	1 5716 1		TC	PCORRCL	
P2055			00,3384	21302 0		CCT	21302	
P2056	REF 1		00,3385	6 2444 1	SMPAC+	AD	-1/2+2	SEE IF ARGUMENT GREATER THAN OR EQUAL TO

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2057				00,3416	0 0006 1	EXTEND		.5.
2058	RFF	1		00,3417	6 2456 1	BZMF	SRTST	IF SC, SEE IF LESS THAN .25.
2059	RFF	665	LAST 1071	00,3410	52 155 1	EXCH	MPAC	WE WILL TAKE THE SQUARE ROOT OF MPAC/2.
2060	RFF	16	LAST 1052	00,3411	22 21 1	EXCH	SR	SHIFT RIGHT 1 AND GO TO THE SGRRT ROUTINE
2061				00,3412	0 0006 1	EXTEND		
2062	RFF	19	LAST 1053	00,3413	7 4736 0	MP	HALF	
2063	RFF	666	LAST 1072	00,3414	52 155 1	EXCH	MPAC	
2064	RFF	17	LAST 1072	00,3415	56 121 1	XCH	SR	
2065	RFF	667	LAST 1072	00,3416	26 155 1	ADS	MPAC +1	GUARANTEED NO OVERFLOW.
2066	RFF	1		00,3417	3 2314 1	CAF	SLOPEH1	ARGUMENT BETWEEN .25 AND .5. GET A
2067				00,3420	0 0006 1	EXTEND		LINEAR APPROXIMATION FOR THIS RANGE.
2068	RFF	668	LAST 1072	00,3421	7 0154 0	MP	MPAC	
2069	RFF	1		00,3422	6 2566 0	AD	BIAS1	$X0/2 = (MPAC/2)(SLOPEH1) + BIAS1/2.$
2070	RFF	142	LAST 1070	00,3423	54 130 1	TS	RLF	$X0/2$ (ARCLC ENTERS HERE).
2071	RFF	669	LAST 1072	00,3424	3 0154 1	CA	MPAC	SINGLE-PRECISION THROUGHOUT.
2072				00,3425	22 007 0	ZL		
2073				00,3426	0 0006 1	EXTEND		
2074	RFF	143	LAST 1072	00,3427	10 131 1	CV	BUF	$(MPAC/2)/(X0/2)$
2075				00,3430	0 0006 1	EXTEND		
2076	RFF	21	LAST 1072	00,3431	7 4736 0	MP	HALF	
2077	RFF	144	LAST 1072	00,3432	26 130 1	ADS	BUF	$x1 = x0/2 + .5(MPAC/2)/(X0/2).$
2078				00,3433	0 0006 1	EXTEND		
2079	RFF	21	LAST 1072	00,3434	7 4736 0	MP	HALF	FORM UP $x1/2$.
2080	RFF	670	LAST 1072	00,3435	52 155 1	EXCH	MPAC	SAVE AND BRING OUT ARGUMENT.
2081				00,3436	0 0006 1	EXTEND		TAKE OF QUOTIENT WITH $x1$.
2082	RFF	145	LAST 1072	00,3437	10 130 1	CV	BUF	
2083	RFF	146	LAST 1072	00,3440	54 131 0	TS	RLF +1	SAVE MAJOR PART OF QUOTIENT.
2084	RFF	214	LAST 1071	00,3441	3 4755 1	CAF	ZERO	FORM MINOR PART OF QUOTIENT USING
2085	RFF	218	LAST 1064	00,3442	56 001 0	XCH	L	(REMAINDER, C).
2086				00,3443	0 0006 1	EXTEND		
2087	RFF	147	LAST 1072	00,3444	10 131 1	CV	BUF	
2088	RFF	205	LAST 1072	00,3445	54 001 1	TS	L	IN PREPARATION FOR CAS.
2089	RFF	148	LAST 1072	00,3446	2 0131 1	CA	RLF +1	
2090	RFF	671	LAST 1072	00,3447	20 155 1	CAS	MPAC	$x2 = x1/2 + (MPAC/2)x1$
2091				00,3450	0 0006 1	EXTEND		OVERFLOWS IF ARG. NEAR FOSMAX.
2092	RFF	1		00,3451	1 3455 1	BZF	TCQBNK00	
2093	RFF	21	LAST 1057	00,3452	3 4733 1	CAF	PCSMAX	
2094	RFF	672	LAST 1072	00,3453	54 154 1	FIXRCCT	TS	MPAC
2095	RFF	673	LAST 1072	00,3454	54 155 1	TS	MPAC +1	
2096	RFF	252	LAST 1071	00,3455	0 0002 0	TCQBNK00	TC	G
								RETURN TO CALLER TO UNNORMALIZE, ETC.

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2097	RFF	1		00,3456	6 4737	1	SFTST	AC	QUARTER	ARGUMENT WAS LESS THAN .5, SEE IF LESS
2098				00,3457	0 0006	1		EXTEND		THAN .25.
2099	RFF	1		00,3460	6 2512	0		BZMF	SQRTACRM	IF SC, BEGIN NORMALIZATION.
2100	RFF	674	LAST 1072	00,3461	52 155	1		EXCH	MPAC	IF BETWEEN .5 AND .25, SHIFT RIGHT 1 AND
2101	RFF	18	LAST 1072	00,3462	22 021	1		LXCH	SR	START AT ARGLO.
2102				00,3463	7 0006	1		EXTEND		
2103	RFF	22	LAST 1072	00,3464	7 4736	0		MF	HALF	
2104	RFF	675	LAST 1073	00,3465	52 155	1		EXCH	MPAC	
2105	RFF	16	LAST 1073	00,3466	56 021	1		XCF	SR	
2106	RFF	676	LAST 1073	00,3467	26 155	1		ACS	MPAC +1	NO OVERFLOW.
2107	RFF	1		00,3470	4 3007	0	ARGLO	CAF	SUBPCLC	(NORMALIZED) ARGUMENT BETWEEN .125 AND
2108				00,3471	0 0006	1		EXTEND		.25
2109	RFF	77	LAST 1073	00,3472	7 0154	0		MF	MPAC	
2110	RFF	1		00,3473	6 2770	0		AC	BIASLC	
2111	RFF	1		00,3474	1 3423	1		TCF	ARGH1 +4	BEGIN SQUARE ROOT.
2112				00,3475	0 0006	1	SQRTAN2	EXTEND		SHIFT LEFT 2 AND INCREMENT RIGHT SHIFT
2113	RFF	678	LAST 1073	00,3476	3 0156	1		CCA	MPAC +1	COUNT (FOR TERMINAL UNNORMALIZATION).
2114	RFF	679	LAST 1073	00,3477	20 156	1		CAS	MPAC +1	
2115	RFF	680	LAST 1073	00,3478	6 0154	1		AD	MPAC	
2116	RFF	681	LAST 1073	00,3479	26 154	0		ACS	MPAC	(NO OVERFLOW).
2117	RFF	682	LAST 1071	00,3480	24 135	0	SQRTACRM	INCR	MPTEMP	FIRST TIME THROUGH, JUST SHIFT LEFT 1
2118				00,3483	0 0006	1		EXTEND		(PLTS IN EFFECTIVE RIGHT SHIFT SINCE
2119	RFF	682	LAST 1073	00,3484	3 0156	0		CCA	MPAC +1	WE WANT MPAC/2).
2120	RFF	682	LAST 1073	00,3485	20 156	1		CAS	MPAC +1	
2121	RFF	684	LAST 1073	00,3486	6 0154	1		AC	MPAC	
2122	RFF	685	LAST 1073	00,3487	26 154	0		ACS	MPAC	(AGAIN NO OVERFLOW).
2123				00,3491	6 0000	1		DCBLF		
2124	RFF	19	LAST 463	00,3491	54 022	0		TS	CYL	
2125	RFF	20	LAST 1073	00,3492	10 022	0	NORMTEST	CCS	CYL	SEE IF ARGUMENT NOW NORMALIZED AT
2126	RFF	21	LAST 1073	00,3493	10 022	0		CCS	CYL	GREATER THAN .125.
2127	RFF	1		00,3494	1 3475	0		TCF	SQRTAN2	NO - SHIFT LEFT 2 MORE AND TRY AGAIN.
2128	RFF	2	LAST 1073	00,3495	1 3417	1		TCF	ARCH1	YES - NOW BETWEEN .5 AND .25.
2129	RFF	1		00,3496	1 3470	0		TCF	ARGLO	ARGUMENT NOW BETWEEN .25 AND .125.

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P2130 TRIGONOMETRIC FUNCTION PACKAGE.

R2131 THE FOLLOWING TRIGONOMETRIC FUNCTIONS ARE AVAILABLE AS INTERPRETIVE OPERATIONS:

R2132 1. SIN COMPUTES $(1/2) \text{SINE}(2 \text{ PI MPAC})$.
 R2134 2. COS COMPUTES $(1/2) \text{CCSINE}(2 \text{ PI MPAC})$.
 R2135 3. ASIN COMPUTES $(1/2 \text{ PI}) \text{ARCSINE}(2 \text{ MPAC})$.
 R2136 4. ACOS COMPUTES $(1/2 \text{ PI}) \text{ARCCOSINE}(2 \text{ MPAC})$.

R2137 SIN-ASIN AND COS-ACOS ARE MUTUALLY INVERSE, IF $\text{SIN}(\text{ASIN}(X)) = X$.

2138	REF	6	LAST 1068	00,3517	00 6724 I	CCSINE	TC	BRANCH	FINDS CCSINE USING THE IDENTITY
2139				00,3520	1 3523 I		TCF	+3	$\text{CCS}(X) = \text{SIN}(\text{PI}/2 - \text{ARS}(X))$.
2140	REF	1		00,3521	1 3524 I		TCF	PRESINE	
2141	REF	2	LAST 1074	00,3522	1 3526 I		TCF	PRESINE	
2142				00,3523	0 0000 I	+3	EXTEND		
2143	REF	686	LAST 1073	00,3524	4 0155 I		CCS	MPAC	
2144	REF	687	LAST 1074	00,3525	52 155 I		DXCH	MPAC	
2145	REF	2	LAST 1073	00,3526	3 4737 I	PRESINE	CAF	QUARTER	PI/2 SCALED.
2146	REF	688	LAST 1074	00,3527	26 154 I		ADS	MPAC	
2147	REF	689	LAST 1074	00,3530	52 155 I	SINE	DXCH	MPAC	DOUBLE ARGUMENT.
2148				00,3531	20 001 I		CCCLRI		
2149				00,3532	54 000 I		CVSK		SEE IF OVERFLOW PRESENT.
2150				00,3533	1 3530 I		TCF	+3	IF NOT, ARGUMENT OK AS IS.
2151				00,3534	0 0006 I		EXTEND		
2152				00,3535	4 0001 I		DCOM		IF SO, WE LOST (OR GAINED) PI, SO
A2153									COMPLEMENT MPAC USING THE IDENTITY
2154	REF	690	LAST 1074	00,3536	52 155 I	+3	DXCH	MPAC	$\text{SIN}(X-(+)\text{PI}) = \text{SIN}(-X)$.
2155	REF	691	LAST 1074	00,3537	3 0154 I		CA	MPAC	
2156				00,3540	6 0000 I		DOUBLE		SEE IF ARGUMENT GREATER THAN .5 IN
2157	REF	210	LAST 1072	00,3541	54 001 I		TS	L	MAGNITUDE. IF SO, REDUCE IT TO LESS THAN
2158	REF	1		00,3542	1 3553 I		TCF	SNI	.5 (+-PI/2 SCALED) AS FOLLOWS:
2159	REF	351	LAST 1071	00,3543	50 000 I		INDEX	A	IF POSITIVE, FORM $\text{PI} - X$, IF NEGATIVE
2160	REF	4	LAST 853	00,3544	3 4735 I		CAF	NEG1/2 +1	USE $-\text{PI} - X$.
2161				00,3545	6 0000 I		DOUBLE		
2162				00,3546	0 0006 I		EXTEND		
2163	REF	692	LAST 1074	00,3547	60 154 I		SU	MPAC	GUARANTEED NO OVERFLOW.
2164	REF	693	LAST 1074	00,3550	54 154 I		TS	MPAC	
2165	REF	694	LAST 1074	00,3551	4 0155 I		CS	MPAC +1	
2166	REF	695	LAST 1074	00,3552	54 155 I		TS	MPAC +1	

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2167
2168 RFF 656 LAST 1074 00,3552 3 006 1 SN1
2169 RFF 19 LAST 1060 00,3554 3 0155 0
2170 RFF 5 LAST 1070 00,3555 52 134 0
2171 RFF 5 LAST 1070 00,3556 1 33 1 1

EXTEND
CCA MPAC
CXCH RLF2
TC DSQSLE

SET UP TO EVALUATE FASTINGS POLYNOMIAL

SCALE MPAC.

2171 RFF 2 LAST 851 00,3557 1 7225 0
2172 00,3558 0000 3 1
2173 00,3559 14441 0
2174 00,3560 37225 1
2175 00,3561 52250 0
2176 00,3562 6 764 1
2177 00,3563 12146 1
2178 00,3564 21276 1
2179 00,3565 75466 1
2180 00,3566 71471 0
2181 00,3567 00226 0
2182 00,3568 32757 0

TC POLY
RFF 3
ZDFC +.3926990796
ZDFC -.6455637111
ZDFC +.318758717
ZDFC -.074780249
ZDFC +.019694988

EVALUATE FOURTH ORDER POLYNOMIAL.

2179 RFF 1
2170 RFF 19 LAST 1030 00,3572 3 2470 0
2171 RFF 19 LAST 1030 00,3574 1 7111 1

CAF LBUE2
TC CMESUP -1

MULTIPLY BY ARGUMENT AND SHIFT LEFT 2.

2180 RFF 657 LAST 1075 00,3575 0 0026 1
2181 RFF 657 LAST 1075 00,3576 3 0156 0
2182 RFF 658 LAST 1075 00,3577 20 156 1
2183 RFF 659 LAST 1075 00,3578 6 0154 1
2184 RFF 700 LAST 1075 00,3579 26 154 0
2185 00,3580 0 0006 1
2186 RFF 701 LAST 1075 00,3581 2 0156 0
2187 RFF 702 LAST 1075 00,3582 20 156 1
2188 RFF 703 LAST 1075 00,3583 6 0154 1
2189 RFF 704 LAST 1075 00,3584 26 154 0
2190 RFF 705 LAST 1060 00,3585 1 6064 1

EXTEND
CCA MPAC +1
CAS MPAC +1
AD MPAC
ADS MPAC
EXTEND
CCA MPAC +1
CAS MPAC +1
AC MPAC
ADS MPAC
TCF DANZIG

NEITHER SHIFT OVERFLOWS.

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P2191 ARCSIN/ARCCOS ROUTINE.

2192	REF	1		00,361	3 3631 0	ARCSIN	CAF	LASINEX	COMPUTE ARCSIN BY USING THE IDENTITY
2193				00,3611	1 3613 1		TCF	+2	ARCSIN(X) = PI/2 - ARCCOS(X).
2194	REF	1		00,3612	3 3712 1	ARCCOS	CAF	LDANZIG	(EXITS IMMEDIATELY).
2195	REF	1		00,3613	54 136 1		TS	ESCAPE	
2196	REF	7	LAST 1074	00,3614	0 6726 1		TC	BRANCH	TEST SIGN OF INPUT.
2197	REF	1		00,3615	1 3625 1		TCF	ACCSST	START IMMEDIATELY IF POSITIVE.
2198	REF	1		00,3616	1 3731 0		TCF	ACCSZRO	ARCCOS(0) = PI/2 = .25.
2199				00,3617	0 0156 1		EXTEND		IF NEGATIVE, USE THE IDENTITY
2200	REF	705	LAST 1075	00,362	4 0155 1		DCS	MPAC	ARCCOS(X) = PI - ARCCOS(-X), FORCING
2201	REF	706	LAST 1076	00,3621	52 155 1		EXCH	MPAC	ARGUMENT POSITIVE.
2202	REF	1		00,3622	3 3734 1		CAF	TCSUPTR	SET EXIT TO CC ABOVE BEFORE
2203	REF	2	LAST 1076	00,3623	56 136 0		XCH	ESCAPE	ARCSIN/ARCCOS CONSIDERATIONS.
2204	REF	1		00,3624	54 137 0		TS	ESCAPE2	
2205	REF	22	LAST 1073	00,3625	4 4736 0	ACCSST	CS	HALF	TEST MAGNITUDE OF INPUT.
2206	REF	707	LAST 1076	00,3626	5 0154 1		AD	MPAC	
2207	REF	252	LAST 1074	00,3627	10 001 0		CCS	A	
2208	REF	1		00,3630	1 3721 1		TCF	ACCSQVE	THIS IS PROBABLY AN OVERFLOW CASE.
2209	REF	1		00,3631	1 3707 0	LASINEX	TCF	ASINEX	
2210	REF	1		00,3632	1 3642 0		TCF	ACCSST2	NO OVERFLOW - PROCEED.
2211	REF	708	LAST 1076	00,3633	10 155 1	CCS	MPAC	+1	IF MAJOR PART IS .5, CALL ANSWER C
2212	REF	215	LAST 1072	00,3634	3 4755 1	CAF		ZERO	UNLESS MINOR PART NEGATIVE.
2213	REF	1		00,3635	1 2627 1		TCF	ACCS=C	
2214	REF	2	LAST 1076	00,3636	1 3642 0		TCF	ACCSST2	
2215	REF	709	LAST 1076	00,3637	54 155 1	ACCS=C	TS	MPAC	+1
2216	REF	71	LAST 1076	00,364	54 154 0		TS	MPAC	
2217	REF	2	LAST 1076	00,3641	3 1136 0		TC	ESCAPE	
2218				00,3642	0 0156 1	ACCSST2	EXTEND		NOW THAT ARGUMENT IS IN PROPER RANGE,
2219	REF	711	LAST 1076	00,3643	4 0155 1		DCS	MPAC	BEGIN COMPUTATION. USE FASTINGS
2220	REF	24	LAST 1076	00,3644	6 4736 1		AD	HALF	APPROXIMATION ARCCOS(X) = SQRT(1-X)P(X)
2221	REF	712	LAST 1076	00,3645	52 155 1		EXCH	MPAC	IN A SCALED VERSION WHERE P(X) IS A
2222	REF	2	LAST 1075	00,3646	52 134 0		EXCH	BUF2	SEVENTH ORDER POLYNOMIAL.
2223	REF	3	LAST 1068	00,3647	0 3343 0		TC	SQRTSLB	RETURNS WITH NORMALIZED SQUARE ROOT.
2224	REF	63	LAST 1072	00,3650	10 135 1		CCS	MPTEMP	SEE IF UN-NORMALIZATION REQUIRED.
2225	REF	1		00,3651	1 3714 1		TCF	ACCSST	IF SO.

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2226	DEF 713	LAST 1076	00,3652	52 155 1	ACCS2	EXCH	MPAC	SET UP FOR POLYNOMIAL EVALUATION.
2227	DEF 714	LAST 1076	00,3653	52 134 1		EXCH	MPAC	
2228	DEF 714	LAST 1077	00,3654	52 155 1		EXCH	MPAC	
2229	DEF 715	LAST 1075	00,3655	0 7225 1		TC	POLY	
2230			00,3656	0 6 1		TC	6	
2231			00,3657	12240 0		2DEC	+0.353553385	Coefficients are C 2(+1)/FISCT(2) where
2232			00,3658	2353 0				
2233			00,3659	2440 0		2DEC*	-0.483017006	E+1* I
2234			00,3660	74721 0		2DEC*	+0.1250273185	E+2* where C stands for original coeffs.
2235			00,3661	47775 1		2DEC*	-0.112501863	E+3*
2236			00,3662	70742 1		2DEC*	+0.00695311612	E+4*
2237			00,3663	23436 0		2DEC*	-0.00394617557	E+5*
2238			00,3664	26756 1		2DEC*	+0.001501297736	E+6*
2239			00,3665	7143 0		2DEC*	-0.000284160334	E+7*
2240			00,3666	42244 0				
2241	DEF 716	LAST 1075	00,3677	3 2470 0	CAF	LPF2		IF FINAL MULTIPLY AND GO TO ANY
2242	DEF 716	LAST 1076	00,3678	0 7111 1	TC	EMPSUF -1		EPILQUE SEQUENCES.
2243	DEF 716	LAST 1076	00,3679	0 0136 0	TC	ESCAPE		
2244	DEF 716	LAST 1077	00,3680	1 0016 1	SUPT2	EXTEND		EPILQUE FOR NEGATIVE INPUTS TO ARCCOS.
2245	DEF 716	LAST 1076	00,3681	4 0155 1	CCS	MPAC		
2246	DEF 716	LAST 1076	00,3682	6 4736 1	AD	HALF		FORMS FI - ARCCOS(-X) = ARCCOS(X).
2247	DEF 716	LAST 1077	00,3683	52 155 1	EXCH	MPAC		
2248	DEF 716	LAST 1076	00,3684	0 0137 1	TC	ESCAPE2		GO TO POSSIBLE ARCSIN EPILQUE.
2249	DEF 717	LAST 1077	00,3685	1 0016 1	ASINEX	EXTEND		
2250	DEF 717	LAST 1077	00,3686	4 0155 1	CCS	MPAC		ARCSIN EPILQUE - CFT ARCSIN(X)
2251	DEF 717	LAST 1077	00,3687	6 4737 1	AD	QUARTER		= PI/2 - ARCCOS(X).
2252	DEF 717	LAST 1077	00,3688	52 155 1	EXCH	MPAC		
2253	DEF 717	LAST 1075	00,3689	1 6164 1	LEAZIC	TCF	DANZIC	

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2252	REF	253	LAST 1076	00,3714	5 100 1	ACSSFR	INDEX	A	
2253	REF	62	LAST 1065	00,3715	3 4736 1	CAF	HIT14		
2254	REF	64	LAST 1076	00,3716	54 135 1	TS	MPTEMP		
2255	REF	4	LAST 1042	00,3717	0 2273 1	TC	VSEPPAD		
2256	REF	1		00,3720	1 3652 1	TCF	ACCS2		
2257				00,3721	0 0006 1	ACQSCVF	EXTEND		
2258	REF	2	LAST 1076	00,3722	1 3637 1	BZF	ACCS=0		
2259				00,3722	0 0006 1	ACQSAEPT	EXTEND		
22591	REF	28	LAST 1071	00,3724	3 0165 0	CCA	LCC		
22592	REF	1		00,3725	0 5722 0	TC	ALARM1		
22593				00,3726	0 1201 1	CCT	1201		
2260	REF	216	LAST 1076	00,3727	3 4755 1	CAF	ZERO		
22601	REF	2	LAST 1078	00,3727	1 3637 1	TCF	ACCS=0		
2261	REF	4	LAST 1077	00,3731	3 4737 0	ACCSZERC	CAF	QUARTER	
2262	REF	4	LAST 1078	00,3732	1 3640 1	TCF	ACCS=0 +1		
2263				00,3722	77763 0	NEG12	DFC	-12	
2264	REF	1		00,3734	1 3702 0	TCSUPT	TCF	SUBTR	

THE SHIFT RIGHT IS LESS THAN 14 SINCE
THE INPUT WAS NON-ZERO CP.

CP SHIFT RIGHT AND ROUND.
PROCEED.

IF MAJOR PART WAS ONLY 1 MORE THAN .5,
CALL ANSWER ZERO.

IF OVERFLOW, CALL ANSWER ZERO FLT
SOUND AN ALARM.

ACCS(C) = FI/2.
SET MPAC AND EXIT VIA ESCAPE.

I. INTERPRETER

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P2266 THE FOLLOWING INSTRUCTIONS ARE AVAILABLE FOR SETTING, MODIFYING, AND BRANCHING ON INDEX REGISTERS:

P2267 1. AXT ADDRESS TO INDEX TRUE.
 P2268 1. AXC ADDRESS TO INDEX COMPLEMENTED.
 P2269 2. LXA LOAD INDEX FROM ERASABLE.
 P2270 4. LXC LOAD INDEX COMPLEMENTED FROM ERASABLE.
 P2271 5. SXA STORE INDEX IN ERASABLE.
 P2272 6. XCHX EXCHANGE INDEX REGISTER WITH ERASABLE.

 P2273 7. INCR INCREMENT INDEX REGISTER.
 P2274 8. XAD ERASABLE ADD TO INDEX REGISTER.
 P2275 9. XSL ERASABLE SUBTRACT FROM INDEX REGISTER.

 P2276 10. TIX BRANCH ON INDEX REGISTER AND DECREMENT.

2277		01, 245		BANK 01	
2278	REF 1			COLLNT*	\$\$/INTER
2279	REF 1	01,2345	0 2442 1	TC	TACSLP
2280	REF 23	LAST 1069	01,2346 3 0117	CA	PCLSH
2281	REF 4	LAST 998	01,2347 5 13 0	INDEX	INDEXLCC
2282	REF 29	LAST 1058	01,2348 54 146 1	TS	X1
2283	REF 42	LAST 1077	01,2351 1 6 64 1	TCF	DANZIG
2284	REF 2	LAST 1079	01,2352 0 2442 1	AXC	TC
2285	REF 24	LAST 1079	01,2353 4 0117 1	CS	PCLSH
2286	REF 1		01,2354 0 2347 1	TC	XSTORE
2287	REF 1		01,2355 0 2430 1	LXA	TC
2288	REF 25	LAST 1079	01,2356 50 117 0	INDEX	PCLSH
2289			01,2357 3 0000 1	CA	0
2290	REF 2	LAST 1079	01,2360 1 2347 1	TCF	XSTORE
2291	REF 2	LAST 1079	01,2361 1 2430 1	LXC	TC
2292	REF 26	LAST 1079	01,2362 50 117 0	INDEX	PCLSH
2293			01,2363 4 0000 0	CS	0
2294	REF 3	LAST 1079	01,2364 1 2347 1	TCF	XSTORE
2295	REF 3	LAST 1079	01,2365 0 2430 1	SXA	TC
2296	REF 5	LAST 1079	01,2366 50 130 0	INDEX	INDEXLCC
2297	REF 37	LAST 1079	01,2367 3 0046 0	CA	X1
2298	REF 27	LAST 1079	01,2370 50 117 0	INDEX	PCLSH
2299			01,2371 54 000 0	TS	0
2300	REF 43	LAST 1079	01,2372 1 6 64 1	TCF	DANZIG

SELECT APPROPRIATE INDEX REGISTER.

CONTAINS C(FIXLCC) OR C(FIXLCC)+1.

LOAD INDEX REGISTER FROM ERASABLE.

LOAD INDEX REG FROM ERASABLE COMPLEMENTED.

STORE INDEX REGISTER IN ERASABLE.

L INT. REGISTER

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2301	REF	4	LAST 1079	01,2373	0 243 1	XCHX	TC	15ADREFS	EXCHANGE INDEX REGISTER WITH ERASABLE.
2302	REF	28	LAST 1079	01,2374	50 117 0		INDEX	PCLISH	
2303				01,2375	3 000 1		CA	0	
2314	REF	6	LAST 1079	01,2376	50 120 0		INDEX	INDEXLCC	
2315	REF	31	LAST 1079	01,2377	56 046 0		XCH	X1	
2316	REF	1		01,2400	1 237 0		TCF	%STOP1	
2317	REF	5	LAST 1080	01,2401	0 243 1	XAD	TC	15ADREFS	ADD ERASABLE TO INDEX REGISTER.
2318	REF	29	LAST 1080	01,2402	50 117 0		INDEX	PCLISH	
2319				01,2403	3 000 1		CA	0	
2310	REF	7	LAST 1080	01,2404	50 130 0	XAD2	INDEX	INDEXLCC	
2311	REF	32	LAST 1080	01,2405	26 046 1		ACS	X1	INCRING OVERFLOWS.
2312	REF	44	LAST 1079	01,2406	1 6764 1		TCF	DANZIG	
2313	REF	2	LAST 1079	01,2407	0 244 1	INCP	TC	TAGSUB	INCREMENT INDEX REGISTER.
2314	REF	3	LAST 1080	01,2410	3 117 0		CA	PCLISH	
2315	REF	1		01,2411	1 2474 1		TCF	XAD2	
2316	REF	6	LAST 1080	01,2412	0 243 1	XSL	TC	15ADREFS	SUBTRACT ERASABLE FROM INDEX REGISTER.
2317	REF	41	LAST 1080	01,2413	50 117 0		INDEX	PCLISH	
2318				01,2414	4 000 0		CS	0	
2319	REF	2	LAST 1080	01,2415	1 2404 1		TCF	XAD2	
2320	REF	4	LAST 1080	01,2416	0 244 1	TIX	TC	TAGSUB	BRANCH AND DECREMENT CA INDEX.
2321	REF	8	LAST 1080	01,2417	50 130 0		INDEX	INDEXLCC	
2322	REF	12	LAST 1080	01,2420	4 0050 0		CS	S1	
2323	REF	9	LAST 1080	01,2421	50 130 0		INDEX	INDEXLCC	
2324	REF	32	LAST 1080	01,2422	6 0046 0		AC	X1	
2325				01,2423	0 00 6 1		EXTEND		NO OPERATION IF DECREMENTED INDEX IS
2326	REF	45	LAST 1080	01,2424	6 6164 0		FMF	DANZIG	NEGATIVE OR ZERO.
2327	REF	10	LAST 1080	01,2425	50 130 0	DCTIXER	INDEX	INDEXLCC	
2328	REF	34	LAST 1080	01,2426	56 046 0		XCH	X1	INCRING OVERFLOWS.
2329	REF	6	LAST 1069	01,2427	1 6651 1		TCF	GCTC	DO THE BRANCH USING THE CADD IN PCLISH.

1 INTERPRETER

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P2237 SUBROUTINE TO CONVERT AN ERASABLE ADDRESS (11 BITS) TO AN EBANK SETTING AND SUBADDRESS.

2232	REF	32	LAST 1080	1,243	4 0117 1	IFADRES	CS	PCLISH	
232	REF	2	LAST 1008	1,2431	6 4772 1		AD	DFC4F	
2234	REF	354	LAST 1078	1,2432	10 0000		CCS	A	DOES THE ADDRESS POINT TO THE WORK AREA?
233	REF	51	LAST 1069	1,2433	2 0120 1		CA	FIXLOC	YES. ACC FIXLOC. EBANK CK AS IS.
2336				1,2434	1 2441 0		TCF	+5	
2237	REF	6	LAST 1008	1,2435	3 5007 0		CA	00T140	NO. SET FRANK & MAKE UP SUBADDRESS.
2238	REF	33	LAST 1001	1,2436	56 117 0		XCH	PCLISH	
2239	REF	63	LAST 1016	1,2437	54 003 0		TS	FRANK	
234	REF	14	LAST 1016	1,244	7 4257 0		MASK	LOCK	
2341	REF	34	LAST 1081	1,2441	26 117 1	+5	ADS	PCLISH	FALL INTO TAGSUB, AND RETURN VIA G.

P2342 SUBROUTINE WHICH SETS THE ADDRESS OF THE SPECIFIED INDEX IN INDEXLOC. (ACTUALLY, THE ADDRESS -3EC.)

2344	REF	52	LAST 1081	1,2442	2 0120 1	TAGSUB	CL	FIXLOC	
2345	REF	11	LAST 1080	1,2443	54 1300 1		TS	INDEXLOC	
2346	REF	26	LAST 1046	1,2444	10 020 1		CCS	CYR	BIT 15 SPECIFIES INDEX.
2347	REF	12	LAST 1081	1,2445	24 130 0		INCR	INDEXLOC	0 MEANS USE X2.
2348	REF	243	LAST 1072	1,2446	1 0002 1		TC	0	
2349	REF	244	LAST 1081	1,2447	0 0002 0		TC	0	1 FOR X1.

L INTERPRETER

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P2350 MISCELLANEOUS OPERATION CODES WITH DIRECT ADDRESSES. INCLUDED HERE ARE:

R2352 1. ITA STORE QPRT (RETURN ADDRESS) IN ERASABLE.
 P2354 2. CALL CALL A SUBROUTINE, LEAVING RETURN IN QPRT.
 R2356 3. QTP RETURN TO BASIC LANGUAGE AT THE GIVEN ADDRESS.
 P2358 4. PHIZ BRANCH IF THE HIGH ORDER OF MPAC IS ZERO (SINGLE PRECISION).
 P2360 5. POV BRANCH ON OVERFLOW.
 P2361 6. GOTC SIMPLE SEQUENCE CHANGE.

2362	OFF	37	LAST	1091	01,2450	10 020 1	RTE/PHIZ	CCS	CYP		
2363	OFF	35	LAST	1091	01,2451	3 0117 0	PTP	CA	POLISH		
2364	OFF	5	LAST	933	01,2452	1 4621 0		TC	SWCALL	-1	SC A "TC 6" FROM ROUTINE LEADS TO DANZIG
2365	OFF	719	LAST	1077	01,2453	10 154 0	PHIZ	CCS	MPAC		
2366	OFF	46	LAST	1080	01,2454	1 6664 1		TCF	DANZIG		
2367	OFF	7	LAST	1080	01,2455	1 6651 1		TCF	GOTO		
2368	OFF	47	LAST	1082	01,2456	1 6664 1		TCF	DANZIG		
2369	OFF	8	LAST	1082	01,2457	1 6651 1		TCF	GOTO		
2370	OFF	9	LAST	1070	01,2460	10 121 1	POV(E)	CCS	OVFLW		BRANCH ON OVERFLOW TO BASIC OF INTERP.
2371					01,2461	1 2462 0		TCF	+2		
2372	OFF	48	LAST	1082	01,2462	1 6664 1		TCF	DANZIG		
2373	OFF	10	LAST	1092	01,2463	54 121 1		TS	OVFLW		
2374	OFF	38	LAST	1082	01,2464	10 020 1		CCS	CYP		
2375	OFF	1			01,2465	1 2451 1		TCF	PTR		IF BASIC.
2376					01,2466	00360 1	BSTORE	CCT	360		
2377	OFF	9	LAST	1082	01,2467	1 6651 1		TCF	GOTO		

L INTCPPETP

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2378	REF	20	LAST 1082	01,2470	10 020 1	BZF/GOTO	CCS	CYR
2379	REF	8	LAST 1076	01,2471	1 6726 1		TC	BRANCH
2380	REF	40	LAST 1082	01,2472	1 6064 1		TCF	DANZIG
2381	REF	1	LAST 1082	01,2473	1 6651 1		TCF	GOTO
2382	REF	50	LAST 1083	01,2474	1 6064 1		TCF	DANZIG
2383	REF	40	LAST 1083	01,2475	10 020 1	RFL/BNA	CCS	CYR
2384	REF	1		01,2476	1 2514 0		TCF	RPI
2385				01,2477	12000 1	5010	DFC	5-R+10
2386	REF	0	LAST 1083	01,2500	1 6726 1		TC	BRANCH
2387	REF	51	LAST 1083	01,2501	1 6064 1		TCF	DANZIG
2388	REF	52	LAST 1083	01,2502	1 6064 1		TCF	DANZIG
2389	REF	11	LAST 1083	01,2503	1 6651 1		TCF	GOTO
2390	REF	10	LAST 1083	01,2504	1 6726 1	RFL	TC	BRANCH
2391	REF	12	LAST 1083	01,2505	1 6651 1		TCF	GOTO
2392	REF	13	LAST 1083	01,2506	1 6651 1		TCF	GOTO
2393	REF	53	LAST 1083	01,2507	1 6064 1		TCF	DANZIG
2394	REF	41	LAST 1083	01,2510	10 020 1	CALL/ITA	CCS	CYR
2395	REF	1		01,2511	1 6651 1		TCF	CALL
2396	REF	7	LAST 447	01,2512	0 5675 0		TC	CCSHCIE
2397	REF	7	LAST 1080	01,2513	0 2430 1		TC	LEADERS
2398	REF	52	LAST 1081	01,2514	50 120 1	INDEX		FIXLOC
2399	REF	11	LAST 1065	01,2515	2 2052 1	CA		QREF
2400	REF	2	LAST 1080	01,2516	1 2370 0		TCF	MSRPF1

SEE WHICH OF-CCCF IS DESTROYED.

DO BZE.

CC GOTO.

SHIFTS OF CODE IN SWITCH INSTRUCTION ACR

DO ENA.

ONLY IF ANZ.

IF POSITIVE OR ZERO.

STOP GREF. (TAGSUB AFTER 15ACFFRS IS SLOW IN THIS CASE, BUT SAVES STORAGE.)

L INIT/PROPTER

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P2401 THE FOLLOWING OPERATIONS ARE AVAILABLE FOR ALTERING AND TESTING INTERPRETIVE SWITCHES:

R2403	01	ONSET	SET A SWITCH AND GO A GOTO IF IT WAS ON.
R2404	01	SETON	SET A SWITCH AND GO A GOTO.
R2405	02	ROFSET	SET A SWITCH AND GO A GOTO IF IT WAS OFF
R2406	03	SET	SET A SWITCH.

R2407	04	RONINV	INVERT A SWITCH AND BRANCH IF IT WAS ON.
R2408	05	INVGO	INVERT A SWITCH AND GO A GOTO.
R2409	06	ROFINV	INVERT A SWITCH AND BRANCH IF IT WAS OFF
R2410	07	INVERT	INVERT A SWITCH.

R2411	10	RONCLR	CLEAR A SWITCH AND BRANCH IF IT WAS ON.
R2412	11	CLRGO	CLEAR A SWITCH AND GO A GOTO.
R2413	12	ROFCLR	CLEAR A SWITCH AND BRANCH IF IT WAS OFF.
R2414	13	CLR	CLEAR A SWITCH.

R2415	14	RON	BRANCH IF A SWITCH WAS ON.
R2416	16	ROFF	BRANCH IF A SWITCH WAS OFF.

P2417 THE ADDRESS SUPPLIED WITH THE SWITCH INSTRUCTION IS INTERPRETED AS FOLLOWS:

R2419	RITS 1-4	SWITCH BIT NUMBER (1-15).
R2420	RITS 5-8	SWITCH OPERATION NUMBER.
R2421	RITS 9-	SWITCH WORD NUMBER (UP TO 64 SWITCH WORDS).

R2422 THE ADDRESS ITSELF IS MADE UP BY THE YUL SYSTEM ASSEMBLER. THE BRANCH INSTRUCTIONS REQUIRE TWO
 R2424 ADDRESSES, THE SECOND TAKEN AS THE DIRECT (OR INDIRECT IF IN BRASABLE) ADDRESS OF THE BRANCH.

2426	OFF	2	LAST	737	01,2517	3	4762	0	SWITCHES	CAF	LOW4	LEAVE THE SWITCH BIT IN SWBIT .
2427	REF	36	LAST	1082	01,2520	7	0117	1		MASK	POLISH	
2428	REF	355	LAST	1081	01,2521	50	000	1		INDEX	A	
2429	OFF	39	LAST	1068	01,2522	3	4735	1		CAF	BIT15	(NUMBER FROM LEFT TO RIGHT.)
2430	OFF	1			01,2523	54	131	0		IS	SWBIT	
2431	REF	38	LAST	985	01,2524	3	4745	0		CAF	BIT7	LEAVE THE SWITCH NUMBER IN SWWORD.
2432					01,2525	0	0006	1		EXTEND		
2433	REF	37	LAST	1084	01,2526	7	0117	1		MP	POLISH	
2434	REF	1			01,2527	54	130	1		IS	SWWORD	
2435					01,2530	0	0004	0		ININT		DURING SWITCH CHANGE SCRIPT CAN USE TCO
2436	REF	356	LAST	1084	01,2531	50	000	1		INDEX	A	LEAVE THE SWITCH WORD ITSELF IN L.
2437	REF	43	LAST	601	01,2532	3	0074	1		CA	STATE	
2438	REF	255	LAST	1091	01,2533	54	002	1		IS	G	G WILL BE USED AS A CHANNEL.

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2441 PIF 24 LAST 911 01,2534 2 4741 1
 2442 PIF 38 LAST 1084 01,2535 6 0006 1
 2443 PIF 1 LAST 1084 01,2536 7 0117 1
 2444 PIF 1 01,2537 7 2577 1
 2445 PIF 357 LAST 1084 01,2540 50 0000 1
 2446 01,2541 1 2542 1

CAF PIT11
 EXTEND
 MD POLISH
 MASK P3TCB4
 INDEX A
 TCF +1

DISPATCH SWITCH BIT OPERATION AS IN BITS
 7-8 OF POLISH.
 CETS 4X2-BIT CODE.

2447 PIF 2 LAST 1084 01,2542 2 0121 1 +1
 2448 01,2543 00 0006 1
 2449 PIF 1 01,2544 04 012 1
 2450 PIF 1 01,2545 1 2554

CA SWBIT
 EXTEND
 ROP QCHAN
 TCF SWSTORE

00 - SET SWITCH IN QUESTION.

2451 PIF 1 LAST 1085 01,2546 3 0131 1 +5
 2452 01,2547 0 0106 1
 2453 PIF 2 LAST 1085 01,2550 06 012 0
 2454 PIF 2 LAST 1085 01,2551 1 2554 0

CA SWBIT
 EXTEND
 ROP QCHAN
 TCF SWSTORE

01 - INVERT SWITCH.

2455 PIF 4 LAST 1085 01,2552 4 0131 0 +9D
 2456 PIF 236 LAST 1084 01,2553 7 0102 1
 2457 PIF 2 LAST 1084 01,2554 50 013 0 SWSTORE
 2458 PIF 44 LAST 1084 01,2555 54 074 0

CS SWBIT
 MASK Q
 INDEX SWWORD
 TS STATE

10 - CLEAR.

NEW SWITCH WORD.

L INTERPRETER

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2457				01,2556	0 0003 1	+13C	RELINT		11 - ACCF.
2458	REF	39	LAST 986	01,2557	2 4737 0		CAF	BIT13	
2459				01,2560	0 0006 1		EXTEND		DISPATCH SEQUENCE CHANGING OR BRANCHING
2460	REF	20	LAST 1085	01,2561	7 0117 1		MF	RELISH	CODE.
2461	REF	2	LAST 1085	01,2562	7 2577 1		MASK	B2TOB4	
2462	REF	258	LAST 1085	01,2563	50 000 1		INDEX	A	
2463				01,2564	1 2565 1		TCF	+1	ORIGINALLY STORED IN BITS 5-6.
2464	REF	297	LAST 1085	01,2565	4 0002 1	+1	CS	0	CC - BRANCH IF CN.
2465	REF	5	LAST 1085	01,2566	7 0131 0	TEST	MASK	SWBIT	
2466	REF	350	LAST 1086	01,2567	10 000 0		CCS	A	
2467	REF	1		01,2570	1 2000 1		TCF	SWSKIP	
2468	REF	1		01,2571	1 6720 0	+5	TCF	SWBRANCH	01 - GO TO.
2469	REF	2	LAST 1086	01,2572	1 2600 1		TCF	SWSKIP	HERE ONLY CN HIT 15.
2470	REF	8	LAST 1082	01,2573	0 5675 0		TC	CCSHCLF	
2471	REF	9	LAST 1086	01,2574	0 5675 0		TC	CCSHCLF	
2472	REF	208	LAST 1086	01,2575	3 0002 0	+9C	CA	0	10 - BRANCH IF CFF.
2473	REF	1		01,2576	1 2566 1		TCF	TEST	
2474				01,2577	00014 1	B2TOB4	DCT	0014	
2475	REF	29	LAST 1078	01,2600	24 164 1	SWSKIP	INCR	LFC	
2476	REF	1		01,2517		SW/	EQUALS	SWITCHES	
2477	REF	54	LAST 1083	01,2601	1 6064 1	+13C	TCF	DANZIC	11 - ACCF.

L FIXED-FIXED CONSTANT ROUTE

USER'S PAGE NO. 1 END

0001 4777 BLOCK 12

0015 REF 1 COUNT# 33/ECONS

R0016 THE FOLLOWING TABLE OF 13 VALUES IS INDEXED. DO NOT INSERT OR REMOVE ANY QUANTITIES.

0007 4732 37777 1 CFSMAX CCT 37777 MUST PRECEED PCSMAX

0008 4733 37777 1 PCSMAX CCT 37777

0004 REF 5 LAST 1 74 4734 LIMITS = NEG1/2

0007 4734 57777 1 NEG1/2 CCT -20000 USED BY SIN ROUTINE (MUST BE TWO LOCATIONS IN FRONT OF EIT14)

R0006 BIT TABLE

0018 4735 40000 0 PIT15 CCT 40000

0011 4736 20000 0 BIT14 CCT 20000

0012 4737 10000 0 EIT13 CCT 10000

0013 4741 04000 0 BIT12 CCT 04000

0014 4741 02000 0 BIT11 CCT 02000

0015 4742 01000 0 PIT10 CCT 01000

0016 4742 00400 0 BITS CCT 00400

0017 4744 00200 0 BIT8 CCT 00200

0019 4745 00100 0 BIT7 CCT 00100

0010 4746 00040 0 BIT6 CCT 00040

0020 4747 00020 0 BIT5 CCT 00020

0021 4750 00010 0 BIT4 CCT 00010

0022 4751 00004 0 BIT3 CCT 00004

0023 4752 00002 0 BIT2 CCT 00002

0024 4753 00001 0 BIT1 CCT 00001

R0025 DO NOT DESTROY THIS COMBINATION, SINCE IT IS USED IN DOUBLE PRECISION INSTRUCTIONS.

0027 4754 77777 0 NEG0 CCT -0 MUST PRECEED ZERO

0028 4755 00001 1 ZERO CCT 0 MUST FOLLOW NEG0

ACC29 00000 00000 0 EIT1 CCT 00000

A0030 00000 00000 0 NC.WDS CCT 2 INTERPRETER

A0031 00000 00000 0 OCTAL2 CCT 3 INTERPRETER

A0032 00000 00000 0 R3D1 CCT 4 PINBALL

0033 4756 00005 1 FIVE CCT 5

A0034 00000 00000 0 PEVENT CCT 6 INTERPRETER

0035 4757 00007 0 SEVEN CCT 7

A0036 00000 00000 0 BIT4 CCT 00000

ACC37 00000 00000 0 R2D1 CCT 11 PINBALL

00375 REF 6 LAST 450 4320 OCT11 = R2D1 P205

A0038 00000 00000 0 BINCON CCT 10 PINBALL

0039 4761 00013 0 ELEVEN CCT 11

A0040 00000 00014 0 OCT14 CCT 14 ALARM AND ABORT (FILLER)

00401 4761 00015 0 OCT15 CCT 15

A0041 00000 00016 0 R1D1 CCT 16 PINBALL

0043 4762 00017 1 LEW4 CCT 17

1 FIXED-FIXED CONSTANT POOL

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A0044				PIT5	CCT	00020	
A0045				ND1	CCT	21	PINBALL
A0046				VEL	CCT	23	PINBALL
A0047				CCT24	CCT	24	SERVICE ROUTINES
A0048				MD1	CCT	25	PINBALL
A0048		4763	00033 1	PITS485	CCT	30	
A0049				CCT31	CCT	31	SERVICE ROUTINES
A0049		4764	00033 1	CCT33	CCT	33	
A0049	REF	2	LAST 860	DEC27	=	CCT33	
A0049		4765	00035 1	CCT35	CCT	35	
A0049	REF	2	LAST 727	DEC29	=	CCT35	
A0050		4766	00032 0	CALLCODE	CCT	00032	
A0051				LCW5	CCT	37	PINBALL
A0052				33DEC	DEC	33	PINBALL (CCTAL 41)
A0053				34DEC	DEC	34	PINBALL (CCTAL 42)
A0054		4767	00045 0	TEUILCFCX	DEC	37	BUILDUP FOR CONVENIENCE IN CAPTESTING
A0055		4770	00046 0	TEFCAYEX	DEC	38	CONVENIENCE FOR CAPTESTING
A0056				BIT6	CCT	00040	
A0057		4771	00050 1	CCT50	CCT	50	
A0058		4772	00055 1	DEC45	DEC	45	
A0059		4773	00060 1	SUPER111	CCT	60	BITS FOR SUPERBANK SETTING 111.
A0060		4774	00062 0	.5SEC	DEC	50	
A0061				BIT7	CCT	00060	
A0062	REF	35	LAST 1084	SUPER100	=	BIT7	BITS FOR SUPERBANK SETTING 100
A0063							(LAST 4K OF POPE)
A0064		4775	00012 1	SUPER101	CCT	120	BITS FOR SUPERBANK SETTING 101
A0065				CCT121	CCT	121	SERVICE ROUTINES
A0066							(FIRST 8K OF ACM)
A0067		4776	00014 1	SUPER110	CCT	140	BITS FOR SUPERBANK SETTING 110.
A0068							(LAST 8K OF ACM)
A0069		4777	00014 0	ISEC	DEC	100	
A0070				LCW7	CCT	177	INTERPRETER
A0071				PIT8	CCT	00200	
A0072				QT215	CCT	215	ALARM AND ABORT
A0073				8.5	CCT	00220	P20-P25 SUNDANCE
A0074		5000	00010 0	2SECS	DEC	200	
A0075				LCW8	CCT	377	PINBALL
A0076				PIT9	CCT	00400	
A0077		5001	00001 1	GN/CODE	CCT	00401	SET S/C CONTROL SWITCH TO G/N
A0078		5002	00054 1	3SECS	DEC	300	
A0079		5003	00062 0	4SECS	DEC	400	
A0080		5004	00077 0	LCW9	CCT	777	
A0081				BIT10	CCT	01000	
A0082				5.50SECS	DEC	.03056	P20-P25 SUNDANCE (CCTAL 00765)
A0083				CCT110	CCT	1103	ALARM AND ABORT
A0084		5005	01124 1	C5/2	DEC	.0363551	(CCTAL 01124)
A0085		5006	01211 1	VCENCS	VA	0509	(SAFE AS CCTAL 1211)
A0086		5007	01400 1	CCT1400	CCT	01400	
A0087		5008	01426 0	VC6N22	VA	0622	

L FIXED-FIXED CONSTANT POOL

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A0087			M105	OCT	174	
00876	5011	01776	BIT52-10	OCT	1776	FINBALL
0088	5012	01777	LCW1	OCT	1777	
A0089			BIT11	OCT	3230	
A0090			2K+3	OCT	2K+3	FINBALL
0091	5013	02177	LCW7+2K	OCT	2177	CP CODE MASK + BANK 1 FEANK SETTING.
0092	5014	02400	FEANK5	OCT	02400	
0093	5015	03000	PRIO3	OCT	03000	
0094	5016	03400	FEANK7	OCT	03400	
A0095			LCW11	OCT	3777	FINBALL
A0096			BIT12	OCT	4000	
A0097			PELTAB	OCT	04025	T4RLPT
0098	5017	05000	PRIO5	OCT	05000	
0099	5020	06000	PRIO6	OCT	06000	
0100	5021	07000	PRIO7	OCT	07000	
A0102			BIT13	OCT	10000	
A0103				OCT	10002	T4RLPT PELTAB +10
A0104			13,7,2	OCT	10102	P20-P25 SUNCANCE
0105	5022	11000	PRIO11	OCT	11000	
A0106			PRIO12	OCT	12000	PANKEALL
0107	5023	13000	PRIO13	OCT	13000	
0108	5024	14000	PRIO14	OCT	14000	
A0109				OCT	14021	T4RLPT PELTAB +20
0110	5025	15000	PRIO15	OCT	15000	
0111	5026	16000	PRIO16	OCT	16000	
A0112			85REGS	DEC	45556	P20-P25 SUNCANCE (OCTAL 16450)
0113	5027	17000	PRIO17	OCT	17000	
0114	5030	17777	OCT1777	OCT	1777	
A0115			BIT14	OCT	20000	
A0116				OCT	20033	T4RLPT PELTAB +30
0117	5031	21000	PRIO21	OCT	21000	
01176	7713		BLOCK		03	
01176			COUNT4		41/ECONS	
0118	7713	22000	PRIO22	OCT	22000	SERVICE ROUTINES
0119	7714	23000	PRIO23	OCT	23000	
0120	7715	24000	PRIO24	OCT	24000	
A0121			5/8+1	OCT	24001	SINGLE PRECISION SUBROUTINES
A0122				OCT	24017	T4RLPT PELTAB +40
0123	7716	25000	PRIO25	OCT	25000	
0124	7717	26000	PRIO26	OCT	26000	
0125	7720	27000	PRIO27	OCT	27000	
A0126			CRPRIC	OCT	30000	FINBALL
A0127				OCT	30036	T4RLPT PELTAB +50
0128	7721	31000	PRIO31	OCT	31000	
0129	7722	31103	C1/2	DEC	7853134	(OCTAL 31103)
0130	7723	32000	PRIO32	OCT	32000	
0131	7724	33000	PRIO33	OCT	33000	
0132	7725	34000	PRIO34	OCT	34000	
A0133				OCT	34034	T4RLPT PELTAB +60

I FIXED-FIXED CONSTANT POOL

USER'S PAGE NO. 4 FC 53

0134	7726	35000	1	PRIC35	CCT	35000
0135	7727	36000	1	PRIC36	CCT	36000
0136	7730	37000	1	PRIC37	CCT	37000
0137	7731	374	1	63/64+1	CCT	37401
A0138				MIT7	CCT	37600
0139	7722	37766	1	CCT37766	CCT	37766
0140	7733	37774	1	CCT37774	CCT	37774
0141	7734	37776	0	CCT37776	CCT	37776
A01411				DPCSMAX	CCT	37777
A0142				BIT15	CCT	40000
A0143				CCT40001	CCT	40001
0144	7735	40014	1	CLCACCCD	CCT	40014
0145	7736	40015	1	CLCAE*	CCT	40015
A0146					CCT	40023
01465	7737	40040	1	BIT15+6	CCT	40040
01466	7740	40000	1	CCT40000	CCT	40000
A0147					CCT	44035
A0148					CCT	50037
A0149					CCT	54000
01495	7741	57777	1	-BIT14	CCT	57777
A0150				RELTAB11	CCT	60000
0151	7742	65552	0	Q3/2	DEC	-63216147
0152	7743	70000	0	12,14,15	CCT	70000
0153	7744	73777	1	-1/8	CCT	72777
0154	7745	74000	1	HIGH4	CCT	74000
0155	7746	74056	1	-ENCERAS	DEC	-2001
A0156				H15	CCT	76000
0157	7747	77700	0	HIGH5	CCT	77700
A0158				-ENCVAC	DEC	-45
A0159				-CCT10	CCT	-10
A0161				NEG4	DEC	-4
0162	7750	77774	0	NEG3	DEC	-3
0163	7751	77775	1	NEG2	CCT	77775
0164	7752	77776	1	NEGONE	DEC	-1

PINBALL

INTERPRETER (CS 1 INSTRUCTION)

T4RUPT RELTAB +7D

T4RLPT RELTAB +8D
 T4RLPT RELTAB +9D
 T4RUPT RELTAB +10D

T4RLPT
 (OCTAL 65552)

(OCTAL 74056)

PINBALL

INTERPRETER
 (OCTAL 77722)
 (OCT 77767)
 (OCTAL 77773)

L FIXED-FIXED CONSTANT BLOCK

USER'S PAGE NO. 5 EC S3

P0165 DEFINED BY EQUALS

P0166 IT WOULD BE TO THE USER'S ADVANTAGE TO OCCASIONALLY CHECK ANY OF THESE SYMBOLS IN ORDER TO PREVENT ANY
 P0168 ACCIDENTAL DEFINITION CHANGES.

0169	REF	5	LAST	862	7752	MINUS1	=	MFC1
0170	REF	11	LAST	1091	7752	MFC1	=	NECDAS
0171	REF	43	LAST	996	4752	ONE	=	BIT1
0172	REF	47	LAST	968	4752	TWO	=	BIT2
0173	REF	1			6250	THREE	=	CCTAL3
0174	REF	21	LAST	1120	7752	LCW2	=	THREE
0175	REF	22	LAST	896	4751	FOUR	=	BIT3
0176	REF	6	LAST	1000	7245	SIX	=	FEVCNT
0177	REF	16	LAST	1071	7757	LCW3	=	SEVEN
0178	REF	41	LAST	968	4750	EIGHT	=	BIT4
0179	REF	7	LAST	1087	4721	NINE	=	R2D1
0180	REF	4	LAST	511	4371	TEN	=	BINGON
0181	REF	2	LAST	737	4760	NCLTCN	=	ELFVEN
0182	REF	15	LAST	458	4367	OCT23	=	VO1
01825	REF	2	LAST	782	4462	OCT25	=	MC1
0183	REF	26	LAST	1047	4742	PRIC1	=	BIT10
0184	REF	7	LAST	1081	5777	FRANK2	=	OCT140
0185	REF	24	LAST	1085	4741	PRIC2	=	BIT11
0186	REF	1			4774	OCT120	=	SLPFF101
0187	REF	3	LAST	607	4776	OCT140	=	SUPFF110
0188	REF	25	LAST	1091	4741	2K	=	BIT11
0189	REF	26	LAST	1091	4741	FRANK4	=	BIT11
0190	REF	30	LAST	821	4741	PRIC4	=	BIT12
0191	REF	12	LAST	888	4715	FRANK6	=	PRIC3
0192	REF	40	LAST	1086	4777	QUARTER	=	BIT12
0193	REF	41	LAST	1091	4777	PRIC10	=	BIT13
01935	REF	1			7666	OCT10001	=	CCSL
0194	REF	26	LAST	1077	4736	PES1/2	=	HALF
0195	REF	64	LAST	1178	4736	PRIC20	=	BIT14
0196	REF	65	LAST	1091	4736	HALF	=	BIT14
0197	REF	5	LAST	470	4255	PRIC30	=	CHRPPI0
0198	REF	10	LAST	1016	4255	BIT12-14	=	PRIC3
01985	REF	3	LAST	1003	4474	OCT30102	=	TLOAD +1
0199	REF	1			7725	R12114	=	PRIC34
0200	REF	4	LAST	1094	4725	NIGMAX	=	BIT15
0201	REF	41	LAST	1191	4735	VICACCD	=	BIT15
0202	REF	1			4112	VICAD*	=	OCT40001
0203	REF	2	LAST	157	4111	OCT60000	=	RELTAB11
0204	REF	6	LAST	907	4350	RANKMASK	=	H15

INTERPRETER USES IN PROCESSING STORECODE

I INTERPRETIVE CONSTANTS

LSEP'S PAGE NO. 1 EQ 52

0001	OFF	1	23,2511		SETLOC	INTPRET1	
0002			23,2513		BANK		
0003	OFF	1			CCUNT*	\$/1CCNS	
0004			23,2513	10000 0	CP1/4TH	2DEC	.25
0005			23,2514	00000 1			
0006			23,2515	00000 1	UNITZ	2DEC	0
0007			23,2516	00000 1			
0008			23,2517	00000 1	UNITY	2DEC	0
0009			23,2521	00000 1			
0010			23,2521	20000 0	UNITX	2DEC	.5
0011			23,2522	00000 1			
0012			23,2523	00000 1	ZEROVECS	2DEC	0
0013			23,2524	00000 1			
0014			23,2525	00000 1		2DEC	0
0015			23,2526	00000 1			
0016			23,2527	00000 1		2DEC	0
0017			23,2527	00000 1			
0018	OFF	13	23,2521		DPHALF	=	UNITY
0019			23,2531	37777 1	DPPOSMAx	CCT	37777
0020			23,2532	37777 1	OCT		37777

L INTERPRETIVE CONSTANTS

LSEF'S PAGE NO. 2 EQ 53

PO 14 INTERPRETIVE CONSTANTS IN THE OTHER HALF-MEMORY

0015	REF	1	12,200		SETICC INTER T2
0016			12,200		RANK

0017	REF	1			COUNT# 44/ICONS
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0018			12,200	00000 1	ZUNIT
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0019			12,200	00000 1	YUNIT
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0020			12,200	00000 1	XUNIT
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0021			12,200	00000 1	ZFCVFC
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0022			12,200	00000 1	
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0023			12,200	00000 1	
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0024			12,200	00000 1	
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0025			12,200	00000 1	
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0026			12,200	00000 1	
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0027			12,200	00000 1	
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0028			12,200	00000 1	
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0029			12,200	00000 1	
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0030			12,200	00000 1	
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0031			12,200	00000 1	
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0032			12,200	00000 1	
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0033			12,200	00000 1	
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0034			12,200	00000 1	
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0035			12,200	00000 1	
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0036			12,200	00000 1	
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0037			12,200	00000 1	
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0038			12,200	00000 1	
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0039			12,200	00000 1	
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0040			12,200	00000 1	
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0041			12,200	00000 1	
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0042			12,200	00000 1	
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0043			12,200	00000 1	
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0044			12,200	00000 1	
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0045			12,200	00000 1	
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0046			12,200	00000 1	
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0047			12,200	00000 1	
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0048			12,200	00000 1	
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0049			12,200	00000 1	
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0050			12,200	00000 1	
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0051			12,200	00000 1	
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0052			12,200	00000 1	
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0053			12,200	00000 1	
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0054			12,200	00000 1	
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0055			12,200	00000 1	
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0056			12,200	00000 1	
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0057			12,200	00000 1	
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0058			12,200	00000 1	
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0059			12,200	00000 1	
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0060			12,200	00000 1	
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-1,-6,-12 MUST REMAIN IN THIS ORDER

THESE TWO CONSTANTS MUST REMAIN

ADJACENT AND THE SAME FOR INTEGRATION

ZEROFC	=	ZFCVFC
HALFEP	=	XUNIT

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USER'S PAGE NO. 1 EC S3

BLOCK 02

L EXECUTIVE

USER'S PAGE NO. 1 EO S2

0001 BLOCK 12
 R0002 TO ENTER A JOB REQUEST REQUIRING NO VAC AREA:

00025	REF	1		5072	1 0004 0	NOVAC	CCOAT* 33/ X50	
00026				5072	1 0004 0	NOVAC	INFINI	
0003	REF	1		5072	4 5164 1		AD	FAKEPRIC LOC(MFAC +6) - LCC(CPRET)
00041	REF	2	LAST 376	5074	54 062 0		TS	NEWPRIC PRIORITY OF NEW JOB + NOVAC C(FIXLCC)
0004				5075	1 0006 1		EXTEND	
0005	REF	301	LAST 1054	5076	5 0002 0		INDEX	G WILL BE UNDISTURBED THROUGHOUT.
0006				5077	2 0001 0		DCA	2CARD OF JOB ENTERED.
0007	REF	1		5100	52 066 0		EXCH	NEWLCC
0008	REF	1		5101	2 5162 0		CAF	EXFCBANK
0009	REF	25	LAST 1037	5102	56 004 0		XCH	FBANK
0010	REF	1		5103	54 061 1		TS	EXCEMFI
0011	REF	1		5104	1 2626 0		TCF	NOVAC2 ENTER EXECUTIVE BANK.

R0012 TO ENTER A JOB REQUEST REQUIRING A VAC AREA - E.G., ALL (PARTIALLY) INTERPRETIVE JOBS.

0014				5105	0 0004 0	FINDVAC	INFINI	
00145	REF	4	LAST 1055	5106	54 062 0		TS	NEWPRIC
0015				5107	0 0006 1		EXTEND	
0016	REF	302	LAST 1055	5110	5 0002 0		INDEX	G
0017				5111	2 0001 0		DCA	G
0018	REF	2	LAST 1055	5112	52 066 0	SPVACIN	EXCH	NEWLCC
0019	REF	2	LAST 1055	5113	2 5162 0		CAF	EXFCBANK
0020	REF	26	LAST 1055	5114	56 004 0		XCH	FBANK
0021	REF	1		5115	1 2602 0		TCF	FINDVAC2 OFF TO EXECUTIVE SWITCHER-BANK.

R00211 TO ENTER A FINDVAC WITH THE PRIORITY IN NEWPRIC TO THE 2CARD ARRIVING IN A AND L:

R002125 USERS OF SPVAC MUST INFINI BEFORE STORING IN NEWPRIC.

00212	REF	302	LAST 1055	5116	56 002 0	SPVAC	XCH	G
00214	REF	6	LAST 891	5117	6 7751 0		AD	NO2
00215	REF	304	LAST 1055	5120	56 002 0		XCH	G
00216	REF	1		5121	1 5112 1		TCF	SPVACIN

R0022 TO SUSPEND A BASIC JOB SO A HIGHER PRIORITY JOB MAY BE SERVICED:

0024	REF	305	LAST 1055	5122	22 002 1	CHANC1	EXCH	G
0025	REF	2	LAST 1055	5123	2 5163 0		CAF	EXFCBANK
0026	REF	306	LAST 1057	5124	56 006 1		XCH	FBANK
0027	REF	1		5125	1 2707 1		TCF	CHANJOB

R003 TO SUSPEND AN INTERPRETIVE JOB:

0031	REF	307	LAST 1056	5126	4 0004 0	CHANC2	TS	LCC	NEGATIVE LCC SHOWS JOB = INTERPRETIVE.
R00315			TRACE (4) WORKS TO "CHANC2".						
0032	REF	311	LAST 1074	5127	54 001 1		TS	L	

I. EXECUTIVE

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0033	REF	4	LAST	1095	512	2	5163	C	+2	CAF	EXECBANK
0033	REF	20	LAST	1095	5131	54	006	0		TS	BBANK
0034	REF	2	LAST	1095	5132	1	2706	0		TCF	CHANJRB -1

L EXECUTIVE

USER'S PAGE NO. 3 FC 52

P0035 TO VOLUNTARILY SUSPEND A JOB UNTIL THE COMPLETION OF SOME ANTICIPATED EVENT (I/O EVENT ETC.):

0037	REF	31	LAST 1095	5133	54 164 0	JOB SLEEP	TS	LCC
0038	REF	5	LAST 1096	5134	3 5163 0		CAF	EXCEFRANK
0039	REF	27	LAST 1097	5135	54 164 1		TS	FRANK
0040	REF	1		5136	1 2777 0		TCF	JOB SLP1

P0041 TO AWAKEN A JOB PUT TO SLEEP IN THE ABOVE FASHION:

0042				5137	1 2004 1	JOB WAKE	INHINT	
00421	REF	4	LAST 1095	514	54 165 1		TS	NEWLCC
0043	REF	72	LAST 1034	5141	4 4752 1		CS	TWO
0044	REF	376	LAST 1095	5142	26 102 1		ADS	Q
0045	REF	6	LAST 1097	5143	3 5163 0		CAF	EXCEFRANK
0046	REF	28	LAST 1097	5144	56 164 0		XCH	FRANK
0047	REF	1		5145	1 3 24 0		TCF	JOB WAKE2

EXIT IS VIA FINEVAC/NEVAC PROCEDURES.

P0049 TO CHANGE THE PRIORITY OF A JOB CURRENTLY UNDER EXECUTION:

0049				5146	1 0004 1	PRIORITY	INHINT	
0050	REF	5	LAST 1095	5147	54 063 0		TS	NEWPRIO
0051	REF	7	LAST 1097	515	3 5163 0		CAF	EXCEFRANK
0052	REF	51	LAST 1097	5151	56 106 1		XCH	FRANK
0053	REF	5	LAST 1097	5152	54 165 1		TS	PANKSET
0054	REF	17	LAST 1097	5153	3 102 2 1		CA	Q
0055	REF	1		5154	1 2073 1		TCF	PRIORITY

NEW PRIORITY ARRIVES IN A. RETURNS TO CALLER AS SOON AS NEW JOB PRIORITY IS HIGHEST. PREPARE FOR POSSIBLE BASIC-STYLE CHANGE-JOB.

P0057 TO REMOVE A JOB FROM EXECUTIVE CONSIDERATIONS:

0058	REF	4	LAST 1097	5155	3 5163 0	END OF JOB	CAF	EXCEFRANK
0060	REF	29	LAST 1097	5156	54 164 1		TS	FRANK
0061	REF	1		5157	1 2104 1		TCF	END JOB1

0062	REF	2	LAST 1095	5158	3 1061 0	EXITING	CA	EXCEFRANK
0063	REF	2	LAST 1097	5159	54 164 1		TS	FRANK
0064	REF	2	LAST 1097	5162	1 6744 1		TCF	Q+2
0065	REF	5	LAST 1095	5163	106 2 1	EXCEFRANK	CAF	FINEVAC2

RETURN TO CALLER AFTER JOB ENTRY COMPLETE.

0065	REF	723	LAST 1082	5164	3 11 1	FAKEPRET	ADRES	MFAC -360
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LCC(MFAC +6) - LCC(GPPET)

I EXECUTIVE

USER'S PAGE NO. 4 EO S3

P0067 LOCATE AN AVAILABLE VAC AREA.

0068				01,2612		BANK	01		
0068E	RFF	1				COUNT*	14/EXEC		
0069	RFF	2	LAST 1097	01,2612	54 01 1	FINDVAC2	TS	EXCITEM1	(SAVE CALLER'S BANK FIRST.)
0070	RFF	4	LAST 244	01,2613	10 40 1	CCS	VAC1USE		
0071	RFF	1		01,2614	1 2621 1	TCF	VACFOUND		
0072	RFF	3	LAST 244	01,2615	10 454 0	CCS	VAC2USE		
0073	RFF	2	LAST 1098	01,2616	1 2621 1	TCF	VACFOUND		
0074	RFF	3	LAST 244	01,2617	1 2621 1	CCS	VAC3USE		
0075	RFF	3	LAST 1098	01,2617	1 2621 1	TCF	VACFOUND		
0076	RFF	2	LAST 244	01,2611	10 604 1	CCS	VAC4USE		
0077	RFF	4	LAST 1098	01,2612	1 2621 1	TCF	VACFOUND		
0078	RFF	3	LAST 244	01,2613	10 660 0	CCS	VACELSE		
0079	RFF	5	LAST 1098	01,2614	1 2621 1	TCF	VACFOUND		
00792	RFF	4	LAST 1098	01,2615	22 061 0	LXCH	EXCITEM1		
00794	RFF	3-8	LAST 1097	01,2616	3 0012 0	CA	0		
0080	RFF	2	LAST 245	01,2617	0 57 6 0	TC	BAILCUT1		
0081				01,2620	31201 0	CCT	31201		NO VAC AREAS
0082	RFF	73	LAST 1097	01,2621	5 4752 0	VACFOUND	AD	TWP	RESERVE THIS VAC AREA BY STORING A ZERO
0083				01,2622	22 067 0	ZI			IN ITS VAC USE REGISTER AND STORE THE
0084	RFF	361	LAST 1094	01,2623	51 000 1	INDEX	A		ADDRESS OF THE FIRST WORD OF IT IN THE
0085				01,2624	21 077 0	LXCH	0 -1		LOW NINE BITS OF THE PRIORITY WORD.
0086	RFF	6	LAST 1097	01,2625	26 062 0	ADS	NEWPRIC		
0087	RFF	217	LAST 1078	01,2626	3 4755 1	NOVAC2	CAF	ZERC	NOVAC ENTERS HERE. FIND A CORE SET.
0088	RFF	5	LAST 467	01,2627	54 064 1	TS	LCCTP		
0089	RFF	1		01,2630	3 2635 0	CAF	NO.CORES		SEVEN SETS OF ELEVEN REGISTERS EACH.
0090	RFF	1		01,2631	54 062 1	NOVAC3	TS	EXCITEM2	
0091	RFF	6	LAST 1098	01,2632	50 064 0	INDEX	LCCTP		
0092	RFF	12	LAST 858	01,2633	10 167 0	CCS	PRIORITY		EACH PRIORITY REGISTER CONTAINS -C IF
0093	RFF	1		01,2634	1 2675 0	TCF	NEXTCORE		THE CORRESPONDING CORE SET IS AVAILABLE.
0094				01,2635	0007 0	NO.CORES	PEC	7	
0095	RFF	2	LAST 1098	01,2636	1 2675 0	TCF	NEXTCORE		AN ACTIVE JOB HAS A POSITIVE PRIORITY
0096									BUT A CORMANT JOB'S PRIORITY IS NEGATIVE

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0097	REF	7	LAST	1098	01,2637	2 063 1	DEFECLNT	CA	NEWPRIO	SET THE PRIORITY OF THIS JOB IN THE CORE
0108	REF	7	LAST	1098	01,2640	50 064 0		INDEX	LCCCTR	SET'S PRIORITY REGISTER AND SET THE
0109	REF	13	LAST	1098	01,2641	54 167 0		TS	PRIORITY	JOB'S PUSH-DOWN POINTER AT THE BEGINNING
0110	REF	1	LAST	1098	01,2642	7 5 74 1		MASK	LCWR	OF THE WORK AREA AND OVERFLOW INDICATOR
0111	REF	8	LAST	1099	01,2643	51 064 0		INDEX	LCCCTR	
0112	REF	29	LAST	1099	01,2646	54 165 1		TS	PUSHLCC	OFF TO PREPARE FOR INTERPRETIVE PROGRAMS
0113	REF	3	LAST	1099	01,2645	10 064 1		CCS	LCCCTR	IF CORE SET ZERO IS BEING LOADED, SET UP
0114	REF	1	LAST	1099	01,2646	1 2662 0		TCF	SETLOC	OVFLND AND FIXLCC IMMEDIATELY.
0115	REF	11	LAST	1099	01,2647	54 121 1		TS	OVFLND	
0116	REF	2	LAST	1099	01,2648	2 0166 0		CA	PUSHLCC	
0117	REF	54	LAST	1099	01,2651	54 120 0		TS	FIXLCC	
0118	REF	6	LAST	1099	01,2652	10 067 1	SPECTEST	CCS	NEWJOB	SEE IF ANY ACTIVE JOBS WAITING (LARE).
0119	REF	2	LAST	1099	01,2653	1 2662 0		TCF	SETLOC	MUST BE AWAKENED BUT UNCHANGED JOB.
0110	REF	17	LAST	1099	01,2654	0 5175 0		TC	CCSHCLE	
0111	REF	11	LAST	1099	01,2655	0 5175 0		TC	CCSHCLE	
0112	REF	7	LAST	1099	01,2656	54 067 1		TS	NEWJOB	*C SHOWS ACTIVE JOB ALREADY SET.
0113	REF	4	LAST	1099	01,2657	52 066 0		EXCH	NEWLCC	
0114	REF	32	LAST	1099	01,2660	52 165 1		EXCH	LCC	
0115	REF	1	LAST	1099	01,2661	1 5160 1		TCF	ENDFIND	
0116	REF	6	LAST	1099	01,2662	52 066 0	SETLCC	EXCH	NEWLCC	SET UP THE LOCATION REGISTERS FOR THIS
0117	REF	11	LAST	1099	01,2663	50 064 0		INDEX	LCCCTR	
0118	REF	32	LAST	1099	01,2664	52 165 1		EXCH	LCC	
0119	REF	8	LAST	1099	01,2665	50 067 0		INDEX	NEWJOB	THIS INDEX INSTRUCTION INSURES THAT THE
0120	REF	14	LAST	1099	01,2666	4 0167 0		CS	PRIORITY	HIGHEST ACTIVE PRIORITY WILL BE COMPARED
0121	REF	8	LAST	1099	01,2667	6 063 1		AC	NEWPRIO	WITH THE NEW PRIORITY TO SEE IF NEWJOB
0122	REF	1	LAST	1099	01,2670	0 0106 1		EXTEND		SHOULD BE SET TO SIGNAL A SWITCH.
0123	REF	2	LAST	1099	01,2671	6 5160 0		PZMF	ENDFIND	
0124	REF	11	LAST	1099	01,2672	2 064 0		CA	LCCCTR	LCCCTR IS LEFT SET AT THIS CORE SET IF
0125	REF	4	LAST	1099	01,2673	54 067 1		TS	NEWJOB	THE CALLER WANTS TO LOAD ANY WPAO
0126	REF	3	LAST	1099	01,2674	1 5160 1		TCF	ENDFIND	REGISTERS, ETC.
0127	REF	1	LAST	1099	01,2675	2 0124 0	NEXTCORE	CAF	CCP INC	
0128	REF	12	LAST	1099	01,2676	26 064 1		ADS	LCCCTR	
0129	REF	2	LAST	1098	01,2677	13 062 1		CCS	EXECTFM2	
0130	REF	1	LAST	1098	01,2678	1 2631 0		TCF	ACVAC2	
01302	REF	5	LAST	1098	01,2679	22 061 0		EXCH	EXECTFM1	
01304	REF	27	LAST	1098	01,2682	3 012 0		CA	S	
0131	REF	4	LAST	1098	01,2683	1 5160 0		TC	PAILOLT1	NO CORE SETS AVAILABLE.
0132	REF	1	LAST	1098	01,2684	31272 0		TC	31272	

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P0143 THE FOLLOWING ROUTINE SWAPS CORE SET 2 WITH THAT WHOSE RELATIVE ADDRESS IS IN NEWJCB.

01345	REF	34	LAST	1096	01,2715	27 164 1	-2	EXCH	LCC	
0135	REF	1	LAST	1097	01,2716	31 165 1	-1	CAL	BANKSET	BANKSET, ACT SBANK, HAS RIGHT CONTENTS.
0136					01,2717	1 014 0	CHANGE	INFINT		
01362					01,2718	1 006 1		EXTEND		
01364	REF	15	LAST	093	01,2711	14 007 1		FOR	SUPERBNK	PICK UP CURRENT SBANK FOR BBCN
01366	REF	212	LAST	1095	01,2712	56 001 0		XCH	L	LCC IN A AND BBCN IN L.
01369	REF	10	LAST	1096	01,2713	50 067 0	+4	INDEX	NEWJCB	SWAP LCC AND BANKSET.
0137	REF	35	LAST	1100	01,2714	52 165 1		EXCH	LCC	
0137	REF	36	LAST	1100	01,2715	52 165 1		EXCH	LCC	
01382	REF	11	LAST	1100	01,2716	31 165 1		CAL	BANKSET	
01384					01,2717	1 006 1		EXTEND		
01386	REF	16	LAST	1100	01,2720	01 007 1		WRITE	SUPERBNK	SET SBANK FOR NEW JOB.
0139	REF	721	LAST	1097	01,2721	52 155 1		EXCH	MPAC	SWAP MULTI-PURPOSE ACCUMULATOR AREAS.
014	REF	11	LAST	1100	01,2722	50 067 0		INDEX	NEWJCB	
0141	REF	722	LAST	1100	01,2723	52 155 1		EXCH	MPAC	
0142	REF	723	LAST	1100	01,2724	52 155 1		EXCH	MPAC	
0143	REF	724	LAST	1100	01,2725	52 157 0		EXCH	MPAC +2	
0144	REF	12	LAST	1100	01,2726	50 067 0		INDEX	NEWJCB	
0145	REF	725	LAST	1100	01,2727	52 157 0		EXCH	MPAC +2	
0146	REF	726	LAST	1100	01,2730	52 157 0		EXCH	MPAC +2	
0147	REF	727	LAST	1100	01,2731	52 161 0		EXCH	MPAC +4	
0148	REF	13	LAST	1100	01,2732	50 067 0		INDEX	NEWJCB	
0149	REF	728	LAST	1100	01,2733	52 161 0		EXCH	MPAC +4	
0150	REF	729	LAST	1100	01,2734	52 161 0		EXCH	MPAC +4	
0151	REF	730	LAST	1100	01,2735	52 163 1		EXCH	MPAC +6	
0152	REF	14	LAST	1100	01,2736	50 067 0		INDEX	NEWJCB	
0153	REF	731	LAST	1100	01,2737	52 163 1		EXCH	MPAC +6	
0154	REF	732	LAST	1100	01,2740	52 163 1		EXCH	MPAC +6	
0155	REF	218	LAST	1098	01,2741	3 4755 1		CAL	ZERO	
0156	REF	12	LAST	1099	01,2742	56 121 0		XCH	OVFLND	MAKE PUSHLOC NEGATIVE IF OVFLND NZ.
0157					01,2743	0 0006 1		EXTEND		
0158					01,2744	1 2747 0		BZF	+2	
0159	REF	31	LAST	1099	01,2745	4 0166 1		C	PUSHLCC	
0160	REF	32	LAST	1100	01,2746	54 166 1		TS	PUSHLCC	
0161	REF	33	LAST	1100	01,2747	52 167 0		EXCH	PUSHLCC	
0162	REF	15	LAST	1100	01,2750	50 067 0		INDEX	NEWJCB	
0163	REF	34	LAST	1100	01,2751	52 167 0		EXCH	PUSHLCC	
0164	REF	35	LAST	1100	01,2752	52 167 0		EXCH	PUSHLCC	SWAPS PUSHLOC AND PRIORITY.
0165	REF	1	LAST	1099	01,2753	2 5004 0		CAL	LCC9	SET FIXLCC TO BASE OF VAC AREA.
0166	REF	15	LAST	1099	01,2754	7 0167 0		MASK	PRIORITY	
0167	REF	55	LAST	1099	01,2755	54 121 0		TS	FIXLCC	
0168	REF	36	LAST	1100	01,2756	10 166 1		CCS	PLSHLCC	SET OVERFLOW INDICATOR ACCORDING TO
0169	REF	219	LAST	1100	01,2757	3 4755 1		CAL	ZERO	
0170	REF	1			01,2760	1 2765 0		TCF	ENDPRG -1	

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0171	REF	37	LAST	1100	01,2761	4 1166 1	CS	PUSHLOC
0172	REF	38	LAST	1101	01,2762	54 1166 1	TS	PUSHLOC
0173	REF	113	LAST	1064	01,2763	3 4753 1	CAF	ONE
0174	REF	12	LAST	1111	01,2764	56 121 0	XCF	OVFINP
0175	REF	16	LAST	1110	01,2765	54 1167 1	TS	NEWJCR

0176					01,2766	1 1167 1	ENDPRCHG	PELINT
0177	REF	47	LAST	1100	01,2767	52 1165 1	EXCH	LOC
0178					01,2770	0 1166 1	EXTEND	
0179					01,2771	6 2773 0	RZAF	+2
0180					01,2772	52 1165 0	ETCP	

BASIC JOBS HAVE POSITIVE ADDRESSES, SC
DISPATCH WITH A ETCP.
1st INTERPRETIVE, SET UP EEANK, ETC.

ENDPRCHG
+4

L EXECUTIVE

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0181 01,2773 4 653 0
 0182 REF 114 LAST 1101 01,2774 6 4752 1
 0183 REF 38 LAST 1101 01,2775 54 154 0
 0186 REF 1 01,2776 1 653 0

CCP
 AD ONE
 TS LCC
 TCF INTRSM

EPICQUE TO JOB CHANGE FOR INTERPRETIVE
 RESUME.

R0187 COMPLETE JOCSLEEP PREPARATIONS.

0188 01,2777 0 0004 0
 0189 REF 16 LAST 1100 01,2778 4 6167 0
 0190 REF 17 LAST 1102 01,2779 54 167 0
 0191 REF 8 LAST 1036 01,2780 3 6177 1
 0192 REF 32 LAST 1097 01,2781 7 616 0
 01921 01,2782 0 0016 1
 01922 REF 17 LAST 1100 01,2783 04 007 1
 0193 REF 12 LAST 1100 01,2784 54 165 1
 0194 REF 221 LAST 1100 01,2785 4 4755 0
 0195 REF 140 LAST 1072 01,2786 54 131 0
 0196 REF 1 01,2787 1 3121 1

JOCSLEF1 INFINT
 CS PRIORITY
 TS PRIORITY
 CAF LCW7
 MASK BBANK
 EXTEND
 PCR SUPERBANK
 TS BANKSET
 CS ZERO
 JOCSLEP2 TS RLF +1
 TCF EJSKAN

PNZ PRIORITY SHOWS JOB ASLEEP.

SAVE OLD SUPERBANK VALUE.

FOLDS - HIGHEST PRIORITY.
 SCAN FOR HIGHEST PRIORITY ALA ENDFJCB.

01961 01,2788 0 0004 0
 019611 REF 17 LAST 1101 01,2789 10 067 1
 019612 01,2790 1 3017 0
 019613 01,2791 0 0003 1
 019614 REF 1 01,2792 1 3217 1

NICHANG2 INFINT
 CCS NEWJOB
 TCF +3
 PELINT
 TCF ADVAN +2

QUICK... DEAT LFT NEWJOB CHANGE TO +0.

NEWJOB STILL PNZ
 NEWJOB HAS CHANGED TO +0. WAKE UP JOB
 VIA NLDIRECT. (VERY RARE CASE.)

01962 REF 74 LAST 1098 01,2793 3 4752 0
 01963 01,2794 0 0006 1
 01964 REF 3 LAST 858 01,2795 05 011 1
 01965 REF 59 LAST 1102 01,2796 52 165 1
 01966 REF 3 LAST 1096 01,2797 1 2713 1

CAF TWC
 EXTEND
 WOR DSALMPLT
 EXCH LCC
 TCF CHANJCB + 4

TURN ON ACTIVITY LIGHT
 AND SAVE ADDRESS INFO FOR BENEFIT OF
 POSSIBLE SLEEPING JOE.

L EXECUTIVE

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P0197 TO WAKE UP A JOB, ACH CORE SET IS FOUND TO LOCATE ALL JOBS WHICH ARE ASLEEP. IF THE POWER IN THE
 P0199 LOC REGISTER OF ANY SUCH JOB MATCHES THAT SUPPLIED BY THE CALLER, THAT JOB IS AWAKENED. IF NO JOB IS FOUND,
 R02 1 LOCCTR IS SET TO -1 AND NO FURTHER ACTION TAKES PLACE.

02 2 RFF 6 LAST 1099 01,024 54 061 1 JCBWAKE2 TS EXCTEM1
 02 2 RFF 221 LAST 1102 01,025 3 4755 1 CAF ZFID
 02 4 RFF 17 LAST 1099 01,026 54 064 1 TS LCCCTR
 02 5 RFF 2 LAST 1098 01,027 3 2635 0 CAF NOCORES
 02 6 RFF 2 LAST 1099 01,028 54 062 1 JCBWAKE4 TS EXCTEM2
 02 7 RFF 14 LAST 1102 01,031 50 064 0 INDEX LCCCTR
 02 8 RFF 18 LAST 1102 01,032 1 167 0 CCS PRIORITY
 02 9 RFF 1 01,033 1 2026 0 TCF JCBWAKE3
 02 10 RFF 01,034 0 014 1 CORFINC CFC 12
 02 11 RFF 1 01,035 1 3045 1 TCF WAKETEST

BEGIN CORE SET SCAN.

02 12 RFF 2 LAST 1099 01,036 3 2134 0 JCBWAKE3 CAF CORFINC
 02 13 RFF 15 LAST 1103 01,037 26 064 1 ACS LCCCTR
 02 14 RFF 4 LAST 11 2 01,040 1 062 1 CCS EXCTEM2
 02 15 RFF 1 01,041 1 3070 0 TCF JCBWAKE4
 02 16 RFF 115 LAST 1102 01,042 4 4753 0 CS CNE
 02 17 RFF 16 LAST 1102 01,043 54 064 1 TS LCCCTR
 02 18 RFF 4 LAST 1099 01,044 1 5167 1 TCF ENDFINC

EXIT IF SLEEPING JOB NOT FOUND.

02 19 RFF 6 LAST 1099 01,045 4 065 1 WAKETEST CS NEWLOC
 02 20 RFF 17 LAST 1103 01,046 50 064 0 INDEX LCCCTR
 02 21 RFF 46 LAST 1102 01,047 6 0164 1 AC LOC
 02 22 01,050 0 06 6 1 EXTEND
 02 23 01,051 1 2 53 0 RFF +2
 02 4 RFF 2 LAST 1103 01,052 1 3035 0 TCF JCBWAKE3

IF MATCH.

EXAMINE NEXT CORE SET IF NO MATCH.

02 25 RFF 10 LAST 1102 01,053 50 064 0 INDEX LCCCTR
 02 26 RFF 10 LAST 1103 01,054 4 167 0 CS PRIORITY
 02 27 RFF 5 LAST 1099 01,055 54 063 0 TS NEWPRIO
 02 28 RFF 10 LAST 1102 01,056 50 064 0 INDEX LCCCTR
 02 29 RFF 2 LAST 1103 01,057 54 167 0 TS PRIORITY

RE-COMPLEMENT PRIORITY TO SHOW JOB AWAKE

02 30 RFF 1 01,060 4 4357 1 CS FRANKMSK
 02 31 RFF 7 LAST 1103 01,061 7 0065 0 MASK NEWLOC
 02 32 RFF 3 LAST 1015 01,062 6 4741 1 AC ZK
 02 33 RFF 8 LAST 1102 01,062 54 065 1 XCH NEWLOC
 02 34 RFF 2 LAST 1103 01,064 7 4351 1 MASK FRANKMSK
 02 35 RFF 23 LAST 1102 01,065 50 064 0 INDEX LCCCTR
 02 36 RFF 12 LAST 1102 01,066 6 0165 0 AC BANKSET
 02 37 RFF 5 LAST 1103 01,067 54 066 0 TS NEWLOC +1

WAKE UP THE 2048 OF THE WAKE ADDRESS
 USING THE CADR IN NEWLOC AND THE EBANK
 HALF OF BANK SAVED IN BANKSET.

02 38 RFF 21 LAST 1102 01,070 1 064 1 CCS LCCCTR
 02 39 RFF 3 LAST 1099 01,071 1 2662 0 TCF SETLOC
 02 40 RFF 1 01,072 1 2552 0 TCF SETTEST

SPECIAL TREATMENT IF THIS JOB WAS
 ALREADY IN THE RUN (0) POSITION.

L EXECUTIVE

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P0241 PRIORITY CHANGE. CHANGE THE CONTENTS OF PRIORITY AND SCAN FOR THE JOB OF HIGHEST PRIORITY.

0243	REF	41	LAST	1103	01,3073	54	164	0	PPICCH2	TS	LCC	
0244	REF	222	LAST	1103	01,3074	2	4755	1	CAF	ZERO		SFT FLAG TO TELL ENDJOB SCANNER IF THIS
0245	REF	152	LAST	1102	01,3075	54	130	1	TS	BUF		JOB IS STILL HIGHEST PRIORITY.
0246	REF	11	LAST	1100	01,3076	2	5004	0	CAF	LCW9		
0247	REF	21	LAST	1103	01,3077	7	0167	0	MASK	PRIORITY		
0248	REF	10	LAST	1103	01,3100	6	0063	1	AD	NEWPR10		
0249	REF	22	LAST	1104	01,3101	54	167	0	TS	PRIORITY		
0250					01,3102	4	0011	0	CM			
0251	REF	1			01,3103	1	3010	1	TCF	JOBSLP2		AND TO FJSCAN.

L EXECUTIVE

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EO 53

P0252 RELEASE THIS CPU SET AND VAC AREA AND SCAN FOR THE JOB OF HIGHEST ACTIVE PRIORITY.

0254			01,2114	4 4735 0	ENDJOB1	INITIAL	
0255	REF 223	LAST 1104	01,2115	4 4735 0	CS	ZERO	
0256	REF 151	LAST 1104	01,2116	54 131 0	TS	PUP +1	
0257	REF 23	LAST 1104	01,2117	56 147 1	XCH	PRIORITY	
0258	REF 12	LAST 1104	01,2118	7 52 4 1	MASK	LCW9	
02581	REF 213	LAST 1104	01,2111	54 1 1	TS	L	
02582	REF 2	LAST 1105	01,2112	4 5164	CS	FAKEPREF	
025821	REF 214	LAST 1104	01,2112	6 00 1 0	AD	L	
02584			01,2114	5 00 6 1	EXTEND		
02584	REF 2	LAST 1102	01,2115	5 3121 0	PZMF	EJSCAN	NOVAC ENDJOB1
0259	REF 115	LAST 1105	01,2116	10 001 1	CCS	L	
0261	REF 362	LAST 1108	01,2117	57 000 1	INDEX	A	
0261			01,2120	54 000 0	TS	0	
0262	REF 24	LAST 1108	01,2121	10 2 2 1	EJSCAN	CCS	PRIORITY +120
0263	REF 1		01,2122	0 3172 0	TC	EJ1	
0264	REF 12	LAST 1105	01,2123	5675 1	TC	CCSHOLE	
0265			01,2124	1 3125 0	TCF	+1	
0266	REF 25	LAST 1105	01,2125	10 217 1	CCS	PRIORITY +240	EXAMINE EACH PRIORITY REGISTER TO FIND
0267	REF 2	LAST 1105	01,2126	0 3172 0	TC	EJ1	THE JOB OF HIGHEST ACTIVE PRIORITY.
0268	REF 13	LAST 1105	01,2127	0 5675 0	TC	CCSHOLE	
0269			01,2128	1 3131 0	TCF	+1	
0270	REF 26	LAST 1105	01,2131	10 223 1	CCS	PRIORITY +360	
0271	REF 3	LAST 1105	01,2132	0 3172 0	TC	EJ1	
0272	REF 27	LAST 1105	01,2133	6761 1	-CCSPR	PRIORITY	
0273			01,2134	1 3135 1	TCF	+1	
0274	REF 28	LAST 1105	01,2135	10 247 1	CCS	PRIORITY +480	
0275	REF 4	LAST 1105	01,2136	0 3172 0	TC	EJ1	
0276	REF 14	LAST 1105	01,2137	0 5675 0	TC	CCSHOLE	
0277			01,2138	1 3141 1	TCF	+1	
0278	REF 29	LAST 1105	01,2141	10 243 1	CCS	PRIORITY +600	
0279	REF 5	LAST 1105	01,2142	0 3172 0	TC	EJ1	
0280	REF 15	LAST 1105	01,2143	0 5675 0	TC	CCSHOLE	
0281			01,2144	1 3145 1	TCF	+1	
0282	REF 20	LAST 1105	01,2145	10 277 1	CCS	PRIORITY +720	
0283	REF 6	LAST 1105	01,2146	0 3172 0	TC	EJ1	
0284	REF 16	LAST 1105	01,2147	0 5675 0	TC	CCSHOLE	
0285			01,2150	1 3151 0	TCF	+1	
02851	REF 31	LAST 1105	01,2151	10 312 1	CCS	PRIORITY +840	

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02852	REF	7	LAST	1105	01,3152	0	3172	0
02853	REF	17	LAST	1105	01,3153	0	3173	0
02854					01,3154	1	3155	1

TC	FJ1
TC	CCSHOLE
TCF	+1

L EXECUTIVE

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P0286 EVALUATE THE RESULTS OF THE SCAN.

0287	R F 152	LAST 1105	01,3155	1 131 0	CCS	PLF +1	SEE IF THERE ARE ANY ACTIVE JOBS WAITING
0288	R F 152	LAST 1106	01,3156	1 5675 0	TC	CCSHOLD	
0289	R F 152	LAST 1107	01,3157	0 5675 0	TC	CCSHOLD	
0290			01,3158	1 3162 0	TCF	+2	
0291	R F 153	LAST 1107	01,3159	1 3207 0	TCF	DUMMYJOB	
0292	R F 153	LAST 1107	01,3160	1 130 1	CCS	PLF	PLF IS ZERO IF THIS IS A PENDING AND
0293	R F 153	LAST 1107	01,3161	1 3165 1	TCF	+2	CHANGED PRIORITY IS STILL HIGHEST.
0294	R F 153	LAST 1107	01,3162	1 2765 0	TCF	ENDPFCG -1	
0295	R F 154	LAST 1108	01,3163	54 001 1	INDEX	R	OTHERWISE, SET NEWJOB TO THE RELATIVE
0296			01,3164	2 7777 0	CAF	0 -1	ADDRESS OF THE NEW JOB'S CCRF SET.
0297	R F 154	LAST 1108	01,3165	4 2133 0	AD	-CCSPR	
0298	R F 154	LAST 1108	01,3166	54 67 1	TS	NEWJOB	
0299	R F 154	LAST 1108	01,3167	1 2715 0	TCF	CHANGEJOB -2	
0300	R F 154	LAST 1107	01,3172	54 132 0	TS	PLF +2	
0301	R F 154	LAST 1107	01,3173	6 131 1	AD	PLF +1	- OLD HIGH PRIORITY.
0302	R F 154	LAST 1107	01,3174	10 000 0	CCS	A	
0303	R F 154	LAST 1107	01,3175	4 0132 0	CS	PLF +2	
0304	R F 154	LAST 1107	01,3176	1 3202 0	TCF	FJ2	NEW HIGH PRIORITY.
0305			01,3177	12 200 1	ACCP		
0306	R F 154	LAST 1108	01,3200	50 002 0	INDEX	0	
0307			01,3201	0 002 0	TC	2	PROCEED WITH SEARCH.
0308	R F 157	LAST 1107	01,3202	54 101 0	TS	PLF +1	
0309			01,3203	1 0006 1	EXTEND		
0310	R F 157	LAST 1107	01,3204	22 130 0	EXCH	PLF	FOR LOCATING CCS PRIORITY + X INSTR.
0311	R F 157	LAST 1107	01,3205	50 130 0	INDEX	PLF	
0312			01,3206	1 0002 0	TC	2	

L EXECUTIVE

USER'S PAGE NO. 14 EO 53

P0314 IDLING AND COMPUTER ACTIVITY (GREEN) LIGHT MAINTENANCE. THE IDLING ROUTINE IS NOT A JOB IN ITSELF,
 R0316 BUT RATHER A SUBROUTINE OF THE EXECUTIVE.

0318	REF	4	LAST	291	1361		FRANK=	SELFRET		SELF-CHECK STORAGE IN EBANK.
0319	REF	224	LAST	1105	01,3207	4 4755 0	DUMMYJOB	CS	ZERO	SFT NEWJOB TO -0 FOR IDLING.
0320	REF	19	LAST	1107	01,3210	54 067 1		TS	NEWJOB	
0321					01,3211	0 0013 1		REFLINT		
0322	REF	75	LAST	1102	01,3212	4 4752 1		CS	TWO	TURN OFF THE ACTIVITY LIGHT.
0323					01,3213	0 0006 1		EXTEND		
0324	REF	31	LAST	1102	01,3214	03 011 1		WANT	DSALMCUT	
0328	REF	20	LAST	1108	01,3215	10 067 1	ADVANCE	CCS	NEWJOB	IS A NEWJOB ACTIVE ?
0329	REF	1			01,3216	1 0012 0		TCF	NOCHANGE	YES... ONE REQUIRING A CHANGE JOB.
0330	REF	76	LAST	1108	01,3217	3 4752 0		CAE	TWO	NEW JOB ALREADY IN POSITION FOR
0331	REF	1			01,3220	1 0226 0		TCF	NODIRECT	EXECUTION.
03317	REF	5	LAST	1108	01,3221	3 1361 1		CA	SELFRET	
03318	REF	216	LAST	1105	01,3222	54 001 1		TS	L	PUT RETURN ADDRESS IN L.
0332	REF	1			01,3223	3 3225 1		CAF	SELFBANK	
0333	REF	5	LAST	596	01,3224	1 5166 1		TCF	SUPDXCHZ + 1	AND DISPATCH JOB.
03338	REF	6	LAST	1108	1361			FRANK=	SELFRET	
0334	REF	3	LAST	292	01,3225	66102 1	SELFBANK	BRCCN	SELFCHK	
0335					01,3226	0 0016 1	NOIRECT	EXTEND		TURN THE GREEN LIGHT BACK ON.
0336	REF	32	LAST	1108	01,3227	05 011 1		WCP	DSALMCUT	
0337	REF	42	LAST	1104	01,3230	52 165 1		TXCF	LDC	JOPS STARTED IN THIS FASHION MUST BE
03372	REF	6	LAST	1108	01,3231	1 5166 1		TCF	SUPDXCHZ	
03378					5165			BLOCK	2	IN FIXED-FIXED SC OTHERS MAY USE.
03379	REF	2	LAST	1095 TO 1098:	59	59*		COUNT*	14/EXEC	
R033791	SUPDXCHZ - ROUTINE TO TRANSFER TO SUPERBANK.									
R033792	CALLING SEQUENCE									
A033793								TCF	SUPDXCHZ	WITH 20ADR OF DESIRED LOCATION IN A + L.
0338	REF	217	LAST	1108	5165	56 001 0	SUPDXCHZ	XCF	L	BASIC.
03381					5166	0 0016 1	+1	EXTEND		
03382	REF	18	LAST	1102	5167	01 007 1		WRITE	SUPERBANK	
03383	REF	33	LAST	1102	5170	54 026 0		TS	BRANK	
03384	REF	218	LAST	1108	5171	0 0011 0		TC	L	
0339					5172	77677 1	NEG1 0	CCT	77677	

L WAITLIST

USER'S PAGE NO. 1 ED S3

R0001 PROGRAM DESCRIPTION

DATE - 10 OCTOBER 1966

R0003 MOD NO - 2

LCR SECTION - WAITLIST

R0005 MOD BY - MILLER (DTMAX INCREASED TO 162.5 SEC)

ASSEMBLY SLARLIST REV 5

R00072 MOD BY KERMAN (INLIST ACCEPTED AT WAITLIST) 2/28/68 SKIPPER REV 4

R00073 MOD BY KERMAN (TWIFLE IN 54) 2/28/68 SKIPPER REV 13.

R00075C

R0008 FUNCTIONAL DESCRIPTION -

R0009 PART OF A SECTION OF PROGRAMS, WAITLIST, TASKOVER, T3DUP, USED TO CALL A PROGRAM, (CALL A TASK),
 R0011 WHICH IS TO BEGIN TO CALL CENTISECONDS. WAITLIST UPDATES TIME3, LST1 AND LST2. THE MEANING OF THESE LISTS
 R0013 FOLLOW.

R0014 $C(TIME) = 16384 - (T1 - T) \text{ CENTISECONDS, } (T = \text{PRESENT TIME, } T1 = \text{TIME FOR TASK1})$

R0016

R0017 $C(LST1) = -(T2 - T1) + 1$ R0018 $C(LST1 + 1) = -(T3 - T2) + 1$ R0019 $C(LST1 + 2) = -(T4 - T3) + 1$

R0020 *

R0021 *

R0022 $C(LST1 + 6) = -(T8 - T7) + 1$ R0023 $C(LST1 + 7) = -(T9 - T8) + 1$ R0024 $C(LST2) = 2CADR \text{ OF TASK1}$ R0025 $C(LST2 + 2) = 2CADR \text{ OF TASK2}$

R0026 *

R0027 *

R0028 $C(LST2 + 14) = 2CADR \text{ OF TASK8}$ R0029 $C(LST2 + 16) = 2CADR \text{ OF TASK9}$

R0030 WARNINGS-

R0031 -----

R0032 1) $1 \leq C(LST1) \leq 1625$ (1 CENTISECOND TO 162.5 SEC)

R0033 2) 6 TASKS MAXIMUM

R0034 3) TASKS VALUE UNDER INTERLUPT INFINITE

R0035 4) TASKS VALUE TO TASKOVER

R0036 CALLING SEQUENCE-

R0037 L-1 CALL WAITLIST (TIME IN CENTISECONDS TO TASK START)

R0038 L TO WAITLIST

R0039 L+1 2CALL OVERSICE TASK

R0040 L+2 (MINUS OF 2CADR)

R0042 L+3 RCLINT (RETURNS HERE)

R00401 TWIFLE -

R00402 -----

R00403 TWIFLE IS FOR USE WHEN THE TASK BEING SET UP IS IN THE SAME FBANK AND FBANK AS THE USER. IN
 R00405 SUCH CASES, IT IMPROVES UPON WAITLIST BY ELIMINATING THE NEED FOR THE BROWN HALF OF THE 2CADR,

L WAITLIST

LSRR'S PAGE NO. 2 EQ 53

R00427 SAVING A WORD. TWIDLE IS LIKE WAITLIST IN EVERY RESPECT EXCEPT CALLING SEQUENCE, TC WIT-

R0043 L-1 CA DELTAT
 R00431 L TC TWIDLE
 R00432 L+1 ADDR DESIRED TASK
 R00433 L+2 DELTAT (RETURNS HERE)

R00435 NORMAL EXIT MODES-

R0044 AT 1+3 OF CALLING SEQUENCE

R0045 ALARM OR TRAPT EXIT MODES-

R0046 TC ADDR
 R0047 OCT 123 (WAITLIST OVERFLOW - TOO MANY TASKS)

R0048 ERASABLE INITIALIZATION REQUIRED-

R0049 ACCOMPLISHED BY FRESH START,--LST2,..., LST2 +16 =ENDTASK
 R0050 LST1,..., LST1 +7 =NEG1/2

R0051 OUTPUT--

R0052 LST1 AND LST2 UPDATED WITH NEW TASK AND ASSOCIATED TIME.
 R0053 FEEDS-

R0054 CENTFALS- A,G,I
 R0055 OTHER - WAITEXIT, WAITACR, WAITTMR, WAITPAK
 R0056 DETAILED ANALYSIS OF TIMING-

R0057 CONTROL WILL NOT BE RETURNED TO THE SPECIFIED ADDRESS (ZCACR) IN EXACTLY DELTA T CENTISECONDS.
 R0059 THE APPROXIMATE TIME MAY BE CALCULATED AS FOLLOWS

R0060 LET TC = THE TIME OF THE TC WAITLIST
 R0061 LET TS = TC +147L + COUNTER INCREMENTS (SET UP TIME)
 R0062 LET X = TS -(1)(TS)/100 (VARIANCE FROM COUNTERS)
 R0063 LET Y = LENGTH OF TIME OF INHIBIT INTERRUPT AFTER TRAPT
 R0064 LET Z = LENGTH OF TIME TO PROCESS TASKS WHICH ARE DUE THIS TRAPT BUT DISPATCHED EARLIER.
 R0066 (Z=0, USUALLY)
 R0067 LET DELTD = THE ACTUAL TIME TAKEN TO GIVE CONTROL TO ZCACR
 R0068 THEN DELTD = TS+DELTA T -X +Y +Z +1.CMS* +COUNTERS*
 R0069 *-THE TIME TAKEN BY WAITLIST ITSELF AND THE COUNTER TICKING DURING THIS WAITLIST TIME.
 R0071

R0072 IN SHORT, THE ACTUAL TIME TO RETURN CONTROL TO A ZCACR IS AUGMENTED BY THE TIME TO SET UP THE TASKS;
 R0074 INTERRUPT, ALL COUNTERS TICKING, THE TRAPT PROCESSING TIME, THE WAITLIST PROCESSING TIME AND THE POSSIBILITY
 R0076 OF OTHER TASKS INHIBITING THE INTERRUPT.

0077

S172

ELUCK 02

I WAITLIST

USER'S PAGE NO. 2 FD 53

0070	REF	14	LAST	221	13,140		FRANK= LST1	TASK	LISTS IN SWITCHED FRANK.
0070	REF	1					COUNT# 11/WAIT		
0070	REF	1				517 3 10 4 0	TWIDDLE	INITIAT	
0081	REF	21	LAST	1106		5174 54 111 1	TS	L	SAVE DELTA TIME IN L
0081	REF	21	LAST	1172		5175 3 475 1	CA	PCSMAX	
0082	REF	21	LAST	1107		5176 26 102 1	ADS	G	CREATING OVERFLOW AND G-1 IN G
0083	REF	34	LAST	1108		5177 3 1006 1	CA	BBANK	
0083	REF	2				521 3 1006 1	EXTEND		
0083	REF	19	LAST	1106		521 64 107 1	PCP	CLIPENK	
0084	REF	230	LAST	1111		5212 55 101 1	XCH	L	
0084	REF	112	LAST	1111		5212 55 102 1	WAITLIST	INITIAT	
0085	REF	1				5214 56 102 1	XCH	G	SAVE DELTA T IN G AND RETURN IN
0086	REF	1				5215 54 101 1	TS	WAITEXIT	WAITEXIT.
0087	REF	2	LAST	1111		5216 0 1006 1	EXTEND		
0088	REF	2	LAST	1111		5217 5 101 1	INDX	WAITEXIT	IF TWIDDLING, THE TS SKIPS TO HERE
0089	REF	1				5218 3 1001 1	CCA	0	PICK UP 20ADR OF TASK.
0090	REF	1				5211 54 103 1	TS	WAITADR	PROCN WILL REMAIN IN L
0091	REF	1				5212 3 5221 1	CLY2	WAITB9	ENTRY FROM FIXDELAY AND VARDELAY.
0092	REF	25	LAST	1111		5213 56 106 1	XCH	BRANK	
0093	REF	1				5214 1 1232 1	TCF	WAIT2	
0094									
0094									
0095	REF	3	LAST	1111		5215 52 102 1	LVWLST	EXCH	WAITEXIT
0096	REF	77	LAST	1108		5216 6 4752 1	AD	TWO	
0097						5217 52 106 1	CTCB		
0098	REF	15	LAST	1111	13,140		FRANK= LST1		
0100	REF	2	LAST	1111		5218 12 103 1	WAITB	BRON	WAIT2
0101									
0101									
0101									
0102	REF	31	LAST	1111		5221 51 102 1	FIXDELAY	INDX	G
0103	REF	2	LAST	1111		5222 3 101 1	CAF	0	
0104	REF	214	LAST	1111		5223 24 102 1	INCR	G	
0105									
0105									
0106	REF	115	LAST	1111		5224 56 102 1	VARDELAY	XCH	G
0107	REF	2	LAST	1111		5225 54 103 1	TS	WAITADR	CT TO G. TASK ADRES TO WAITADR.
0108	REF	26	LAST	1111		5226 3 101 1	CA	BBANK	BBANK IS SAVED DURING DELAY.
0109	REF	2	LAST	1111		5227 12 1006 1	EXTEND		
0110	REF	28	LAST	1111		5228 54 107 1	PCP	SUPERANK	ADD SBANK TO BRON.
0111	REF	221	LAST	1111		5231 54 101 1	TS	L	
0112	REF	1				5232 3 5225 1	CAF	DELAYEX	
0113	REF	4	LAST	1111		5233 54 101 1	TS	WAITEXIT	GO TO TASKOVER AFTER TASK ENTRY.
0114	REF	1				5234 1 5212 1	TCF	CLY2	

GAP: ASSEMBLE REVISION 116 OF ACC PROGRAM LUMINARY BY NASA 2021112-071

19:09 AUG. 11, 1965 SKIPPER .C97 PAGE 1112

4 WAITLIST

USFP'S PAGE NO. 4 E2 S3

0115 FILE 67 LAST 959 5235 1 5257 DELAYEX TCP TASKOVER -2 RETURNS TO TASKOVER

L WAITLIST

USER'S PAGE NO. 5 E3 S3

POL14 ENDTASK MUST BE ENTERED IN FIXE-FIXED SO IT IS DISTINGUISHABLE BY ITS ADRES ALONE.

0118	REF	10	LAST 1111	53,14			FRANK= LST1		
0119	REF	1		5247	72527	1	ENDTASK -20ACD	SVC13	
0110	REF	1		5247	73714	1			
0120	REF	24	LAST 920	5247	1	76	1	SVC13	CCS FL/GWHDZ
0121	REF	63	LAST 1112	5247	1	5261	0	TCF	TASKOVER
0122	REF	69	LAST 1112	5242	1	5261	0	TCF	TASKOVER
0123				5243	1	5244	1	TCF	+1
01271	REF	3	LAST 223	5246	11	5251	0	CRIMUSE	CCS IMUACD
01272	REF	1		5246	1	5256	1	TCF	SVC13X
01273				5246	1	5251	0	TCF	+2
01274	REF	2	LAST 1113	5247	1	5256	1	TCF	SVC13X
01275	REF	3	LAST 1113	5246	1	5256	1	TCF	SVC13X
0124	REF	1		5247	3	7724	0	+3	CAF PRIC35
0125	REF	25	LAST 1112	5252	0	5272	1	TC	NCVAC
0126	REF	6	LAST 852	5253	1	3563	1	FRANK= NDCX	
0127	REF	1		5254	14063	1	20ACD	NDCONLY	
0128	REF	7	LAST 1113	5255	1	5261	0	TCF	TASKOVER
01281	REF	16	LAST 774	5256	0	5271	0	SVC13X	TC
01282				5257	1764	1		TCF	500
01283	REF	2	LAST 1113	5258	1	5241	1	TC	SVC13

DRIFT FLAG

DON'T DO ANYTHING IF SCREEN ELSE IS IN
INSTALL.COMPENSATE FOR ABC COEFFICIENTS ONLY.
ENABLE EVERY 81.93 SECONDS

DELAY MAX OF 2 TIMES FOR IMUZERO.

CHECK DRIFT FLAG AGAIN.

L WAITLIST

USER'S PAGE NO. 6 E3 S3

P0129 BEGIN TASK INSPECTION.

0131			01,3232		BANK 01	
0131	REF 1				COUNT* \$\$/WAIT	
0132	REF 1		01,3232	54 762 1	TS WAITBANK	REBANK OF CALLING PROGRAM.
01322	REF 316	LAST 1111	01,3233	3 000 2 0	CA Q	
01324			01,3234	0 000 6 1	EXTEND	
01326	REF 1		01,3235	6 3524 1	PZMF WAITPCH	
0133	REF 2	LAST 22	01,3236	4 0 26 1	CS TIME3	
0134	REF 36	LAST 1045	01,3237	6 4744 1	AD BIT8	BIT 8 = OCT 200
0135	REF 365	LAST 1107	01,3240	10 000 0	CCS A	TEST 200 - C(TIME3). IF POSITIVE,

IT MEANS THAT TIMER OVERFLOW HAS OCCURRED PRIOR TO CS TIME3 AND THAT C(TIME3) = T - T1, INSTEAD OF 1.0 - (T1 - T). THE FOLLOWING FOUR ORDERS SET C(A) = TC - T1 + 1 IN EITHER CASE.

0139	REF 2	LAST 1091	01,3241	6 6112 0	AD OCT40001	OVERFLOW HAS OCCURRED. SET C(A) =
0140	REF 366	LAST 1114	01,3242	4 000 0 0	CS A	T - T1 + 1.0 - 201

R0141 NORMAL CASE (C(A) NZ) YIELDS SAME C(A): $-C - (1.0 - (T1 - T)) + 200 - 1$

0142	REF 1		01,3243	6 3371 1	AD OCT40201	
0143	REF 317	LAST 1114	01,3244	6 00 2 0	AD G	RESULT = TC - T1 + 1.
0144	REF 367	LAST 1114	01,3245	10 000 0	CCS A	TEST TC - T1 + 1
0145	REF 17	LAST 1113	01,3246	6 1400 1	AD LST1	IF TC - T1 POS, GO TO WLST5 WITH
0146	REF 1		01,3247	1 3311 0	TCF WLST5	C(A) = (TC - T1) + C(LST1) = TC - T2 + 1
0147			01,3250	13 251 0	NCCF	
0148	REF 319	LAST 1114	01,3251	4 000 2 1	CS G	

R0149 NOTE THAT THIS PROGRAM SECTION IS NEVER ENTERED WHEN T-T1 G/F -1,
 P0150 SINCE TC-T1+1 = (TC-T1) + (T-T1+1), AND DELTA T = TC-T G/F +1. (G/F
 R0151 SYMBOL MEANS GREATER THAN OR EQUAL TO). THUS THERE NEED BE NO COM-
 R0152 PAREN OVER A PREVIOUS OR IMMINENT OVERFLOW OF TIME3 HERE.

0153	REF 1		01,3252	6 4736 1	AD PCS1/2	WHEN TC IS NEXT, FORM QUANTITY
0154	REF 2	LAST 1114	01,3253	6 4736 1	AD PCS1/2	1.0 - DELTA T = 1.0 - (TC - T)
0155	REF 3	LAST 1114	01,3254	56 026 0	XCF TIME3	
0156	REF 7	LAST 1035	01,3255	6 4736 1	AD AECMAX	
0157	REF 315	LAST 1114	01,3256	6 000 2 0	AD Q	1.0 - DELTA T NOW COMPLETE.
0158			01,3257	0 000 6 1	EXTEND	ZFPD INDEX Q.
0159			01,3260	22 007 0	QXCF 7	(ZG)

L WAITLIST

LSEF'S PAGE NO. 7 E3 S3

0160	REF	1P	LAST	1114	01,3261	57'40' 1	WTLST4	XCH	LST1	
0161	REF	1P	LAST	1115	01,3262	57'40' 0		XCH	LST1 +1	
0162	REF	2P	LAST	1115	01,3263	57'40' 0		XCH	LST1 +2	
0163	REF	21	LAST	1115	01,3264	57'40' 1		XCH	LST1 +3	
0164	REF	22	LAST	1115	01,3265	57'40' 1		XCH	LST1 +4	
0165	REF	23	LAST	1115	01,3266	57'40' 1		XCH	LST1 +5	
0166	REF	24	LAST	1115	01,3267	57'40' 1		XCH	LST1 +6	
0167	REF	25	LAST	1115	01,3270	57'40' 0		XCH	LST1 +7	
0168	REF	2	LAST	1111	01,3271	50'42' 1		CA	WAIT/CO	(MINOR PART OF TASK CODE HAS REFE IN L.)
0169	REF	321	LAST	1114	01,3272	50'42' 0		IND-X	Q	
0170					01,3273	1 3274 1		TCF	+1	
0171	REF	24	LAST	744	01,3274	52'411 0		DXCH	LST2	
0172	REF	25	LAST	1115	01,3275	52'413 1		DXCH	LST2 +2	
0173	REF	26	LAST	1115	01,3276	52'415 1		DXCH	LST2 +4	
0174	REF	27	LAST	1115	01,3277	52'417 0		DXCH	LST2 +6	
0175	REF	28	LAST	1115	01,3311	53'421 0		DXCH	LST2 +80	
0176	REF	29	LAST	1115	01,3301	53'423 1		DXCH	LST2 +100	AT END, CHECK THAT C(LST2+10) IS STOP
0177	REF	30	LAST	1115	01,3302	53'425 1		DXCH	LST2 +120	
0178	REF	31	LAST	1115	01,3303	53'427 0		DXCH	LST2 +140	
0179	REF	32	LAST	1115	01,3304	53'421 1		DXCH	LST2 +160	
0180	REF	3	LAST	222	01,3305	5 5236 0		AD	ENDTASK	END ITEM, AS CHECK FOR EXCEEDING
0181										THE LENGTH OF THE LIST.
0182					01,3306	01 6 1		EXTEND		DUMMY TASK ADRES SHOULD BE IN FIXED-
0183	REF	1			01,3307	1 5215 0		RZF	LWTLIST	FIXED SO ITS ADRES ALONE DISTINGUISHES
0184	REF	1			01,3310	1 3364 1		TCF	WTARCT	IT.

L WAITLIST

USFP'S PAGE NO. 8 E3 S3

0185	RFF	268	LAST	1114	01,3311	10 331 0	WTLST5	CCS	A	TEST	TC - T2 + 1
0186	RFF	26	LAST	1115	01,3312	6 1401 0		AD	LST1 +1		
0187					01,3313	1 3317 0		TCF	+4		
0188	RFF	116	LAST	1102	01,3314	6 4753 1		AD	ONE		
0189	RFF	1			01,3315	0 3375 0		TC	WTLST2		
0190					01,3316	0001 1		CCT	1		
0191	RFF	365	LAST	1116	01,3317	10 000 0	+4	CCS	A	TEST	TC - T3 + 1
0192	RFF	27	LAST	1116	01,3320	5 1402 0		AD	LST1 +2		
0193					01,3321	1 3325 1		TCF	+4		
0194	RFF	117	LAST	1116	01,3322	6 4752 1		AD	ONE		
0195	RFF	2	LAST	1116	01,3323	0 3375 0		TC	WTLST2		
0196					01,3324	0002 1		CCT	2		
0197	RFF	370	LAST	1116	01,3325	10 000 0	+4	CCS	A	TEST	TC - T4 + 1
0198	RFF	28	LAST	1116	01,3326	6 1403 1		AD	LST1 +3		
0199					01,3327	1 3323 0		TCF	+4		
0200	RFF	118	LAST	1116	01,3330	6 4753 1		AD	ONE		
0201	RFF	3	LAST	1116	01,3331	0 3375 0		TC	WTLST2		
0202					01,3332	0003 1		CCT	3		
0203	RFF	371	LAST	1116	01,3333	10 000 0	+4	CCS	A	TEST	TC - T5 + 1
0204	RFF	29	LAST	1116	01,3334	6 1404 0		AD	LST1 +4		
0205					01,3335	1 3341 0		TCF	+4		
0206	RFF	119	LAST	1116	01,3336	6 4753 1		AD	ONE		
0207	RFF	4	LAST	1116	01,3337	0 3375 0		TC	WTLST2		
0208					01,3338	0004 1		CCT	4		
0209	RFF	372	LAST	1116	01,3341	10 000 0	+4	CCS	A	TEST	TC - T6 + 1
0210	RFF	30	LAST	1116	01,3342	6 1405 1		AD	LST1 +5		
0211					01,3343	1 3347 0		TCF	+4		
0212	RFF	120	LAST	1116	01,3344	6 4753 1		AD	ONE		
0213	RFF	5	LAST	1116	01,3345	0 3375 0		TC	WTLST2		
0214					01,3346	0005 1		CCT	5		
0215	RFF	373	LAST	1116	01,3347	10 000 0	+4	CCS	A	TEST	TC - T7 + 1
0216	RFF	31	LAST	1116	01,3350	6 1406 1		AD	LST1 +6		
0217					01,3351	1 3355 0		TCF	+4		
0218	RFF	121	LAST	1116	01,3352	6 4753 1		AD	ONE		
0219	RFF	6	LAST	1116	01,3353	0 3375 0		TC	WTLST2		
0220					01,3354	0006 1		CCT	6		

L WAITLIST

USER'S PAGE NO. 5 E3 S3

0221	REF 374	LAST 1116	01,3305	10 000 0	+4	CCS	A
0222	REF 32	LAST 1116	01,3306	6 1407 0		AD	LST1 +7
0223			01,3357	1 2262 0		TCF	+4
0224	REF 122	LAST 1116	01,3300	6 4753 1		AD	CN
0225	REF 7	LAST 1116	01,3361	0 3375 0		TC	WT1ST2
0226			01,3362	0 0007 0		CCT	7
0227	REF 275	LAST 1117	01,3362	1 0000 0	+4	CCS	A
0228	REF 1		01,3364	0 3372 1	WTABCR1	TC	FILLED
0229			01,3365	12 266 0		GROUP	
0230	REF 122	LAST 1117	01,3366	6 4753 1		AD	CN
0231	REF 1	LAST 1117	01,3367	0 3375 0		TC	WT1ST2
0232			01,3370	0 0010 0		CCT	10
0233			01,3371	402 1 0	OCT4*201	CCT	4*201

CAN'T GET REF

L WAITLIST

USER'S PAGE NO. 10 E3 S3

02332	REF	6	LAST 1111	01,3372	52 162 1	FILLED	EXCH	WAITEXIT
02334	REF	5	LAST 1199	01,3373	0 5706 0		TC	BAILOUT1
02336				01,3374	312 3 1		CCT	31203

NO ROOM IN THE INN

L WAITLIST

USER'S PAGE NO. 11 P3 S2

R0234 THE ENTRY TO WLST2 JUST PRECEDING OCT N IS FOR T LE TO LE T - 1.
 R0235 N N+1

R0236 (L MEANS LESS THAN OR EQUAL TO). AT ENTRY, $C(A) = -(TC - T + 1)$
 R0237 N+1

R0238 THE LAST ENTRY $-(T - T + 1)$ IS TO BE REPLACED BY $-(TC - T + 1)$, AND
 R0239 N+1 N

R0240 THE ENTRY $-(T - TC + 1)$ IS TO BE INSERTED IMMEDIATELY FOLLOWING.
 R0241 N+1

0242 RFF 1 01,2375 54 004 1 WLST2 TS WAITTEMP $C(A) = -(TC - T + 1)$

0243 RFF 321 LAST 1115 01,2376 50 002 0 INDEX C

0244 RFF 322 LAST 1119 01,2377 3 000 1 CAP 0

0245 RFF 322 LAST 1119 01,2377 54 002 1 TS 0

INDEX VALUE INTO C.

0246 RFF 124 LAST 1117 01,2401 3 4752 1 CAP CAP

0247 RFF 2 LAST 1119 01,2402 6 0564 0 AD WAITTEMP

0248 RFF 323 LAST 1119 01,2403 50 002 0 INDEX 0

0249 RFF 33 LAST 1117 01,2404 27 377 1 ADS LST1 -1

$C(A) = -(TC - T) + 1.$
 N

0250 RFF 2 LAST 1119 01,2405 4 0164 1 CS WAITTEMP

0251 RFF 324 LAST 1119 01,2406 50 002 0 INDEX C

0252 RFF 1 01,2407 1 3261 0 TCF WLST4

R0253 $C(TIME) = 1.0 - (T1 - T)$

R0254 $C(LST1) = -(T2 - T1) + 1$

R0255 $C(LST1+1) = -(T3 - T2) + 1$

R0256 $C(LST1+2) = -(T4 - T3) + 1$

R0257 $C(LST1+3) = -(T5 - T4) + 1$

R0258 $C(LST1+4) = -(T6 - T5) + 1$

R0259 $C(LST2) = 2C(0) - TASK1$

R0260 $C(LST2+2) = 2CAP - TASK2$

R0261 $C(LST2+4) = 2CAPR - TASK3$

R0262 $C(LST2+6) = 2CAPR - TASK4$

R0263 $C(LST2+8) = 2CAPR - TASK5$

R0264 $C(LST2+10) = 2CAPR - TASK6$

L WAITLIST

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P0265 ENTERS HERE ON T3 RUPT TO DISPATCH WAITLISTED TASK.

0266					01,3410	0	00	6	1	T3RUPT	EXTEND		
0267	OFF	21	LAST	1111	01,3411	04	00	7	1		PCW	SUPPBANK	READ CURRENT SUPPBANK VALUE AND
0268	OFF	6	LAST	983	01,3412	54	00	16	1		TS	BANKRUPT	SAVE WITH E AND F BANK VALUES.
0269					01,3413	0	00	6	1		EXTEND		
0270	OFF	6	LAST	983	01,3414	22	00	12	1		QXCH	QRLPT	
0271	OFF	6	LAST	1087	01,3415	3	47	24	0	T3RUPT2	CAF	NOCL12	DISPATCH WAITLIST TASK.
0272	OFF	34	LAST	1115	01,3416	57	04	7	0		XCH	LST1 +7	
0273	OFF	35	LAST	1120	01,3417	57	04	6	1		XCH	LST1 +6	
0274	OFF	36	LAST	1120	01,3418	57	04	5	1		XCH	LST1 +5	
0275	OFF	37	LAST	1120	01,3419	57	04	4	0		XCH	LST1 +4	1. MOVE UP LST1 CONTENTS, ENTERING
0276	OFF	38	LAST	1120	01,3420	57	04	03	1		XCH	LST1 +3	A VALUE OF 1/2 +1 AT THE BOTTOM
0277	OFF	39	LAST	1120	01,3421	57	04	2	0		XCH	LST1 +2	FOR T6-T5, CORRESPONDING TO THE
0278	OFF	40	LAST	1120	01,3422	57	04	01	0		XCH	LST1 +1	INTERVAL 01.01 SEC FOR ENFTASK.
0279	OFF	41	LAST	1120	01,3423	57	04	00	1		XCH	LST1	
0280	OFF	42	LAST	1111	01,3424	6	47	24	1		AD	PCSMAX	2. SET T2 = 1.0 - T2 -T USING LIST 1.
0281	OFF	4	LAST	1114	01,3425	26	00	06	1		ADS	TIME3	SO T2 WONT TICK DURING UPDATE.
0282	OFF	4	LAST	567	01,3426	54	00	32	1		TS	PLPTAGN	
0283	OFF	225	LAST	1108	01,3427	4	47	00	0		CS	ZERO	
0284	OFF	5	LAST	1120	01,3428	54	00	32	1		TS	PLPTAGN	SETS PLPTAGN TO +1 ON OVERFLOW.
0285					01,3429	0	00	6	1		EXTEND		DISPATCH TASK.
0286	OFF	4	LAST	1115	01,3430	4	52	37	0		DCS	ENDTASK	
0287	OFF	33	LAST	1115	01,3431	53	04	31	1		DXCH	LST2 +16F	
0288	OFF	34	LAST	1120	01,3432	53	04	27	0		DXCH	LST2 +140	
0289	OFF	35	LAST	1120	01,3433	53	04	25	1		DXCH	LST2 +120	
0290	OFF	36	LAST	1120	01,3434	53	04	23	1		DXCH	LST2 +100	
0291	OFF	37	LAST	1120	01,3435	53	04	21	0		DXCH	LST2 +80	
0292	OFF	38	LAST	1120	01,3436	53	04	17	0		DXCH	LST2 +6	
0293	OFF	39	LAST	1120	01,3437	53	04	15	1		DXCH	LST2 +4	
0294	OFF	40	LAST	1120	01,3438	53	04	13	1		DXCH	LST2 +2	
0295	OFF	41	LAST	1120	01,3439	53	04	11	0		DXCH	LST2	
0296	OFF	22	LAST	1111	01,3440	56	00	00	0		XCH	L	
0297					01,3441	0	00	06	1		EXTEND		
0298	OFF	22	LAST	1120	01,3442	01	00	07	1		WRITE	SUPPBANK	SET SUPPBANK FROM PBOCN OF 2CAOP
0299	OFF	223	LAST	1120	01,3443	56	00	01	0		XCH	L	RESTORE TO L FOR DXCH 2.
0300					01,3444	52	00	06	0		TCR		

L WAITLIST

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P0301 RETURN, AFTER EXECUTION OF TASKS BELOW TASK:

0302				5261			BLOCK 02	
0303	RFF	2	LAST 1111 TO 1114	54	54*		CLUNT# 33/WAIT	
0304	RFF	8	LAST 112	5261	10 352 1	TASKOVER	CCS RUPTAGN	IF +1 RETURN TO T3RUPT, IF -1 RESUME.
0305	RFF	2	LAST 1111	5262	3 522 1		CAF WAITBR	
0306	RFF	27	LAST 1111	5263	54 006 0		TS RBANK	
0307	RFF	1		5264	1 3415 0		TCE T3RUPT2	DISPATCH NEXT TASK IF IT WAS DUE.
0308	RFF	7	LAST 112	5265	2 0016 0		CA BANKRUPT	
0309				5266	0 0016 1		EXTEND	
031	RFF	22	LAST 1120	5267	1 0017 1		WRITE SUPERBANK	RESTORE SUPERBANK BEFORE RESUME IS DONE
0311				527	0 0016 1	RECUAP	EXTEND	
0312	RFF	7	LAST 1120	5271	22 012 1		QXCH QRUPT	
0313	RFF	1	LAST 1121	5272	2 0016 0	NCGPSM	CA BANKRUPT	
0314	RFF	1	LAST 1121	5273	54 006 1		XCH RBANK	
0315	RFF	11	LAST 112	5274	52 11 0	NCGPSM	QXCH ARUPT	
0315*				5275	0 0016 1		RELINT	
0316				5276	5 0017 1		RESUME	

L WAITLIST

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P0317 LONGCALL

P0318 PROGRAM DESCRIPTION DATE= 17 MARCH 1967
 R0319 PROGRAM WRITTEN BY W.F. JOHNSON LCG SECTION WAITLIST
 R0320 MOD BY= G. NELSON TO THE DOCUMENTATION ASSEMBLY SUNLISK REV. 100

R0321 FUNCTIONAL DESCRIPTION-
 R0322 LONGCALL IS CALLED WITH THE DELTA TIME ARRIVING IN A,L SCALED AS TIME2,TIME1 WITH THE 20ACR OF THE TASK
 R0323 IMMEDIATELY FOLLOWING THE TC LONGCALL. FOR EXAMPLE, IT MIGHT BE DONE AS FOLLOWS WHERE TIMELOC IS THE NAME OF
 R0324 A REGISTER CONTAINING A DELTA TIME AND WHERE TASKLOC IS THE NAME OF THE LOCATION AT WHICH LONGCALL IS TO
 R0325 START

P0326 CALLING SEQUENCE-

A0330	EXTEND
A0331	CCA TIMELOC
A0332	TC LONGCALL
A0333	20ADR TASKLOC

R0334 NORMAL EXIT MODE-

R0335 1). TC WAITLIST
 R0336 2). ETCR (TO L43 OF CALLING ROUTINE 1ST PASS THRU LONGCYCL)
 R0337 3). ETCR (TO TASKLOC IN SUBSEQUENT PASSES THRU LONGCYCL)

R0338 ALARM OR ABORT EXIT MODE-

R0339 NONE

R0340 OUTPUT-

R0341 LONGTIME AND LONGTIME+1 = DELTA TIME
 R0342 LONGEXIT AND LONGEXIT+1 = RETURN 20ACR
 R0343 LONGCAD AND LONGCAD+1 = TASK 20ACR
 R0344 1 = SINGLE PRECISION TIME FOR WAITLIST

R0345 PARAMETER INITIALIZATION-

R0346 1 = MOST SIGNIFICANT PART OF DELTA TIME
 R0347 2 = LEAST SIGNIFICANT PART OF DELTA TIME
 R0348 3 = ADDRESS OF 20ADR TASK VALUE

R0349 OPERIS-

R0350 A,C,L
 R0351 LONGCAD AND LONGCAD+1
 R0352 LONGEXIT AND LONGEXIT+1
 R0353 LONGTIME AND LONGTIME+1

R0354 *** THE FOLLOWING IS TO BE IN FIXED-FIXED AND UNSWITCHED FEASIBLE ***

R0355	1277	BLUCK 12
R0356	DEF 42 LAST 1120 12,1400	CRANK= LST
R0357	DEF 1 1277 531F3 1 LONGCALL DXCH LONGTIME	CONTAIN THE DELTA TIME
R0358	DEF 1 1277 531F3 1	EXTEND
		CONTAIN THE 20ADR

1 WAITLIST

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0359 PFF 225 LAST 1114 01,11 5 2042 0 NDX Q
 0360 03 2 4 1111 0 ECA Q
 0361 PFF 1 5312 521147 0 EXCH LONGCALL
 0362 0314 0 1116 1 EXTEND
 0363 PFF 1 5315 2 5211 0 ECA LONGCALL
 0364 0316 52 116 1 CTR
 0365 PFF 4 LAST 1122 03,1410 FRANK= LST1
 0366 PFF 1 0317 13453 LONGCALL 2CADR LONGCALL2
 0367 PFF 1 0317 2162 0

NOW GO TO THE APPROPRIATE SWITCHED BANK
 FOR THE REST OF LONGCALL

P0367 *** THE FOLLOWING MAY BE IN A SWITCHED BANK, INCLUDING ITS ERASABLE ***

0368 01,1452 BANK Q1
 0369 PFF LAST 1114 TO 1113 145 1454 COUNT# 43/WAIT
 0370 PFF 1 01,1453 211435 1 LONGCALL2 LONGEXIT +1
 0371 PFF 1 LAST 1111 01,1454 3 4752 0 CA TWC
 0372 PFF 226 LAST 1122 01,1455 26 112 1 ACS G
 0373 PFF 2 LAST 1122 01,1456 551434 1 TS LONGEXIT
 0374 PFF 2 LAST 1122 01,1457 3 1152 0 CA LONGTIME
 0375 PFF 276 LAST 1117 01,1458 13 111 0 CCS A
 0376 PFF 1 01,1461 1 2467 0 TCF LONGCYCL
 0377 PFF 1 01,1462 1 3464 0 TCF +2
 0378 PFF 1 01,1463 1 3522 0 TCF LONGECC
 0379 PFF 3 LAST 1122 01,1464 3 1153 1 +2 CA LONGTIME +1
 0380 PFF 2 LAST 1122 01,1466 6 3522 1 EXTEND
 0381 PFF 2 LAST 1122 01,1466 6 3522 1 BZNF LONGECC

SAVE THE CORRECT PP FOR RETURN
 OBTAIN THE RETURN ADDRESS

CHECK FOR LEGITIMATE DELTA-TIME

HI-ORDER OK --> ALL TS OK.
 HI-ORDER ZERO --> CHECK LC-ORDER.
 HI-ORDER NEG. --> NEG. DT
 CHECK LC-ORDER FOR ZERO OR NEGATIVE.

BAC DELTA-TIME. ABORT

R0374 *** WAITLIST ASK LONGCYCL ***

0375 01,1467 0 1116 1 LONGCYCL EXTEND
 0376 PFF 1 01,147 4 35 1 1 CCS DPBIT14
 0377 PFF 4 LAST 1123 01,1471 211152 0 FAS LONGTIME
 0378 PFF 5 LAST 1123 01,1472 111153 0 CCS LONGTIME +1
 0379 PFF 1 01,1473 1 2512 0 TCF MCHTIME

CAN WE SUCCESSFULLY TAKE ABOUT 1.25
 MINUTES OFF OF LONGTIME

A0380
 A0381
 A0382
 A0383
 A0384
 0385 01,1474 12 475 0 NDXP
 0386 01,1475 1 3475 0 TCF +1
 0387 PFF 6 LAST 1122 01,1476 111152 1 CCS LONGTIME
 0388 PFF 2 LAST 1122 01,1477 1 3512 0 TCF MCHTIME
 0389 01,1478 0 111 1 DPBIT14 CCT 00000
 0390 01,1479 20000 0 CCT 20000

THE PROBLEM BEHIND THIS PART IS
 INVOLVE, TAKING INTO ACCOUNT THAT THE
 WORDS MAY NOT BE SIGNED CORRECTED (OF
 BASIC INSTRUCTIONS
 DO NOT SIGN CORRECT) AND THAT WE SUBTRACT
 TWO BIT14 (1 OVER HALF THE PCS. VALUE
 REPRESENTABLE IN SINGLE WORD)
 CAN'T GET HERE *****

A0391

LONGCALL

L WAITLIST

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0342	FFF	66	LAST 1121	01,3512	2 4736 1	LASTTIME	CA	BIT14	GET BACK THE CORRECT DELTA TROP WAITLIST
0344	FFF	7	LAST 1123	01,3513	27*153 0		ADS	LONGTIME +1	
0345	FFF	27	LAST 1123	01,3514	0 5202 0		TC	WAITLIST	
0346	FFF	44	LAST 1123	01,3515	0 3517 1		FRANK=	LST1	
0347	FFF	1		01,3516	0 3517 1		2CACP	GETCACP	THE ENTRY TO OUR LONGCACP
0348	FFF	1		01,3516	0 3517 1				
0349	FFF	1		01,3517	3 3521 1	LONGRTSN	CA	TASKOVER	SET IT UP SO THAT ONLY THE FIRST EXIT IS
0350	FFF	3	LAST 1123	01,3518	53*435 0		CXCH	LONGEXIT	TO THE CALLER OF LONGCALL
0351	FFF	3	LAST 1123	01,3519	62 1 6 0		CTCB		THE REST ARE TO TASKOVER
0352	FFF	67	LAST 1124	01,3520	2 4736 1	MUCHTIME	CA	BIT14	WE HAVE OVER OUR ABOUT 1.25 MINUTES
0353	FFF	84	LAST 1124	01,3521	0 5202 0		TC	WAITLIST	SO SET UP FOR ANOTHER CYCLE THROUGH HERE
0354	FFF	45	LAST 1124	01,3522	1 3523 1		FRANK=	LST1	
0355	FFF	2	LAST 1123	01,3523	0 3467 1		2CACP	LONGCYCL	
0356	FFF	2	LAST 1123	01,3524	0 2564 0				
0357	FFF	1		01,3525	1 3527 1		TCF	LONGRTSN	NEW EXIT PROPERLY
0358	FFF	1		01,3526	1 3527 1				
0359	FFF	1		01,3527	1 3527 1				
0360	FFF	1		01,3528	1 3527 1				
0361	FFF	1		01,3529	1 3527 1				
0362	FFF	1		01,3530	1 3527 1				
0363	FFF	1		01,3531	1 3527 1				
0364	FFF	1		01,3532	1 3527 1				
0365	FFF	1		01,3533	1 3527 1				
0366	FFF	1		01,3534	1 3527 1				
0367	FFF	1		01,3535	1 3527 1				
0368	FFF	1		01,3536	1 3527 1				
0369	FFF	1		01,3537	1 3527 1				
0370	FFF	1		01,3538	1 3527 1				
0371	FFF	1		01,3539	1 3527 1				
0372	FFF	1		01,3540	1 3527 1				
0373	FFF	1		01,3541	1 3527 1				
0374	FFF	1		01,3542	1 3527 1				
0375	FFF	1		01,3543	1 3527 1				
0376	FFF	1		01,3544	1 3527 1				
0377	FFF	1		01,3545	1 3527 1				
0378	FFF	1		01,3546	1 3527 1				
0379	FFF	1		01,3547	1 3527 1				
0380	FFF	1		01,3548	1 3527 1				
0381	FFF	1		01,3549	1 3527 1				
0382	FFF	1		01,3550	1 3527 1				
0383	FFF	1		01,3551	1 3527 1				
0384	FFF	1		01,3552	1 3527 1				
0385	FFF	1		01,3553	1 3527 1				
0386	FFF	1		01,3554	1 3527 1				
0387	FFF	1		01,3555	1 3527 1				
0388	FFF	1		01,3556	1 3527 1				
0389	FFF	1		01,3557	1 3527 1				
0390	FFF	1		01,3558	1 3527 1				
0391	FFF	1		01,3559	1 3527 1				
0392	FFF	1		01,3560	1 3527 1				
0393	FFF	1		01,3561	1 3527 1				
0394	FFF	1		01,3562	1 3527 1				
0395	FFF	1		01,3563	1 3527 1				
0396	FFF	1		01,3564	1 3527 1				
0397	FFF	1		01,3565	1 3527 1				
0398	FFF	1		01,3566	1 3527 1				
0399	FFF	1		01,3567	1 3527 1				
0400	FFF	1		01,3568	1 3527 1				
0401	FFF	1		01,3569	1 3527 1				
0402	FFF	1		01,3570	1 3527 1				
0403	FFF	1		01,3571	1 3527 1				
0404	FFF	1		01,3572	1 3527 1				
0405	FFF	1		01,3573	1 3527 1				
0406	FFF	1		01,3574	1 3527 1				
0407	FFF	1		01,3575	1 3527 1				
0408	FFF	1		01,3576	1 3527 1				
0409	FFF	1		01,3577	1 3527 1				
0410	FFF	1		01,3578	1 3527 1				
0411	FFF	1		01,3579	1 3527 1				
0412	FFF	1		01,3580	1 3527 1				
0413	FFF	1		01,3581	1 3527 1				
0414	FFF	1		01,3582	1 3527 1				
0415	FFF	1		01,3583	1 3527 1				
0416	FFF	1		01,3584	1 3527 1				
0417	FFF	1		01,3585	1 3527 1				
0418	FFF	1		01,3586	1 3527 1				
0419	FFF	1		01,3587	1 3527 1				
0420	FFF	1		01,3588	1 3527 1				
0421	FFF	1		01,3589	1 3527 1				
0422	FFF	1		01,3590	1 3527 1				
0423	FFF	1		01,3591	1 3527 1				
0424	FFF	1		01,3592	1 3527 1				
0425	FFF	1		01,3593	1 3527 1				
0426	FFF	1		01,3594	1 3527 1				
0427	FFF	1		01,3595	1 3527 1				
0428	FFF	1		01,3596	1 3527 1				
0429	FFF	1		01,3597	1 3527 1				
0430	FFF	1		01,3598	1 3527 1				
0431	FFF	1		01,3599	1 3527 1				
0432	FFF	1		01,3600	1 3527 1				
0433	FFF	1		01,3601	1 3527 1				
0434	FFF	1		01,3602	1 3527 1				
0435	FFF	1		01,3603	1 3527 1				
0436	FFF	1		01,3604	1 3527 1				
0437	FFF	1		01,3605	1 3527 1				
0438	FFF	1		01,3606	1 3527 1				
0439	FFF	1		01,3607	1 3527 1				
0440	FFF	1		01,3608	1 3527 1				
0441	FFF	1		01,3609	1 3527 1				
0442	FFF	1		01,3610	1 3527 1				
0443	FFF	1		01,3611	1 3527 1				
0444	FFF	1		01,3612	1 3527 1				
0445	FFF	1		01,3613	1 3527 1				
0446	FFF	1		01,3614	1 3527 1				
0447	FFF	1		01,3615	1 3527 1				
0448	FFF	1		01,3616	1 3527 1				
0449	FFF	1		01,3617	1 3527 1				
0450	FFF	1		01,3618	1 3527 1				
0451	FFF	1		01,3619	1 3527 1				
0452	FFF	1		01,3620	1 3527 1				
0453	FFF	1		01,3621	1 3527 1				
0454	FFF	1		01,3622	1 3527 1				
0455	FFF	1		01,3623	1 3527 1				
0456	FFF	1		01,3624	1 3527 1				
0457	FFF	1		01,3625	1 3527 1				
0458	FFF	1		01,3626	1 3527 1				
0459	FFF	1		01,3627	1 3527 1				
0460	FFF	1		01,3628	1 3527 1				
0461	FFF	1		01,3629	1 3527 1				
0462	FFF	1		01,3630	1 3527 1				
0463	FFF	1		01,3631	1 3527 1				
0464	FFF	1		01,3632	1 3527 1				
0465	FFF	1		01,3633	1 3527 1				
0466	FFF	1		01,3634	1 3527 1				
0467	FFF	1		01,3635	1 3527 1				
0468	FFF	1		01,3636	1 3527 1				
0469	FFF	1		01,3637	1 3527 1				
0470	FFF	1		01,3638	1 3527 1				
0471	FFF	1		01,3639	1 3527 1				
0472	FFF	1		01,3640	1 3527 1				
0473	FFF	1		01,3641	1 3527 1				
0474	FFF	1		01,3642	1 3527 1				
0475	FFF	1		01,3643	1 3527 1				
0476	FFF	1		01,3644	1 3527 1				
0477	FFF	1		01,3645	1 3527 1				
0478	FFF	1		01,3646	1 3527 1				
0479	FFF	1		01,3647	1 3527 1				
0480	FFF	1		01,3648	1 3527 1				
0481	FFF	1		01,3649	1 3527 1				
0482	FFF	1		01,3650	1 3527 1				
0483	FFF	1		01,3651	1 3527 1				
0484	FFF	1		01,3652	1 3527 1				
0485	FFF	1		01,3653	1 3527 1				
0486	FFF	1		01					

L LATITUDE LONGITUDE SUBROUTINES

LSR'S PAGE NO. 1 E) S3

R0011 SUBROUTINE TO CONVERT ALT VECTOR AT GIVEN TIME TO LAT, LONG AND ALT

R0012 CALLING SEQUENCE

R0013 1-1 CALL

R0014 L LAT-LONG

R0015 SUBROUTINE USE

R0016 R-TC-RP, ARCTAN, SETGAMMA, SETRE

R0017 CASCABLE UNIT, ETC.

R0018 XCG, -AYC, AZC, T FROM (S T AT LAUNCH TIME)

R0019 ALPHA = POSITION VECTOR METERS E-20

R0020 MFAC = TIME (SECS E-20)

R0021 RACFLAC = 1, TO COMBINE EARTH RADIUS, = 0 FOR FIXED EARTH RADIUS

R0022 L1 = RACFLAC = 1 FOR EARTH, 1 FOR MOON

R0023 OUTPUT

R0024 LATITUDE IN LAT (EVS. P-1)

R0025 LONGITUDE IN LONG (EVS. E-1)

R0026 ALTITUDE IN ALT METERS E-20

R0027 0017 31,3742

R0028 0018 13,2106

R0029 0019 10,2151

RANK 30

SETLOC LATLONG

RANK

R0030 REF 1

R0031 REF 7 LAST 964

R0032 0022 13,2451

R0033 0023 12,2250

R0034 0024 13,2103

R0035 0025 12,2154

R0036 0026 REF 8 LAST 1125

R0037 0027 13,2350

R0038 0028 REF 2 LAST 115

R0039 0029 REF 6 LAST 1043

R0040 0030 14,2061

R0041 0031 REF 6 LAST 964

R0042 0032 REF 1

R0043 0033 13,2463

R0044 0034 REF 5 LAST 971

R0045 0035 14,2116

R0046 0036 REF 9 LAST 1125

R0047 0037 REF 1

R0048 0038 13,2371

R0049 0039 REF 1

R0050 0040 13,2272

R0051 0041 REF 1 LAST 1125

R0052 0042 13,2177

R0053 0043 REF 11 LAST 1125

R0054 0044 13,2377

LAT-LONG

CALLTYPE

CALLTYPE 54/LT-LG

FEAKK= ALPHAV

LAT-LONG STO SETPE

INCRFFX

OD

STCVL 60

ALPHAV

PUSH ABVAL

STEEL ALPHAM

ZEROCVFC

R00FF COS

LUNAFAC

CALLTYPE

CALLTYPE

R-TC-RP

UNIT

STCALL ALPHAV

SETGAMMA

CALL

SETPE

DLOAD DSC

ALPHAV

PEOL DSC

ALPHAV +2

DAD SCOT

SAVE TIME IN E-70 FOR R-TC-RP

C-EC= R FOR P-TC-RP

ARS. VALUE OF R FOR ALT FORMULA BELOW

SET MFAC=1 FOR EARTH, NON-ZERO FOR MOON

USE COS(C) TO GET NON-ZERO IN MFAC

O=EARTH, 1=MOON

RR VECTOR CONVERTED FROM R P-25

UNIT RP P-1

U2= 1/2 SINL FOR SETPE SLEP BELOW

SET GAMMA=E2/02 FOR EARTH, 1 FOR MOON

SCALED P-1

CALC RE METERS E-20

L LATITUDE LONGITUDE SLURGLINES

USER'S PAGE NO. 2 F4 S2

0045				13,241	76415 1
0046	OFF	1		13,241	00011 1
0047	OFF	7	LAST 584	13,242	14021 1
0048	OFF	12	LAST 1126	13,243	02036 0
0049	OFF	7	LAST 584	13,244	24022 1
0050	OFF	4	LAST 584	13,245	26510 1
0051	OFF	5	LAST 926	13,246	15120 0
0052	OFF	12	LAST 1126	13,247	02032 1
0053	OFF	8	LAST 1126	13,248	14121 1
0054	OFF	14	LAST 1126	13,249	02034 1
0055	OFF	4	LAST 1126	13,250	24022 1
0056	OFF	5	LAST 1126	13,251	26510 1
0057	OFF	3	LAST 926	13,252	15122 1
0058	OFF	3	LAST 1126	13,253	02037 1
0059				13,254	77625 0
0060	OFF	2	LAST 146	13,255	02073 0
0061	OFF	5	LAST 926	13,256	35124 1
0062	OFF	2	LAST 1126	13,257	02074 1

EMP	SLIP	
	GAMFF	
STOOL	CCSTH	CCS(LAT) P-1
	ALPHAV +4	
STCALL	SINTH	SIN(LAT) B-1
	APCTAN	
STOOL	LAT	LAT B0
	ALPHAV	
STOOL	CCSTH	CCS(LONG) B-1
	ALPHAV +2	
STCALL	SINTH	SIN(LONG) E-1
	APCTAN	
STOOL	LONG	LONG. REVS B-0 IN RANGE -1/2 TO 1/2
	ALPHAV	
CSU		ALT= R-RF METERS B-29
	FEADM	
STCALL	ALT	EXIT WITH ALT METERS P-29
	INCRPEX	

L LATITUDE L ALTITUDE SUBROUTINES

USER'S PAGE NO. 4 E4 S2

0109			13,245	74215 1	EAC	VXSC	(PE + ALT)(UNIT R) METERS E-30
0110	REF 6	LAST 1126	13,2461	01124 1		ALT	
0111	REF 17	LAST 1127	13,2462	02032 1		ALPHAV	
0112			13,2463	77772 1	VSL1		P METERS R-29
0113	REF 15	LAST 1128	14,2464	36742 1	STCALL	ALPHAV	EXIT WITH R IN METERS E-29
0114	REF 5	LAST 1127	13,2465	03674 1		INCDREF X	
0115	SUBROUTINE TO COMPLETE EARTH RADII						

R0116 INPUT

R0117 1/2 SIN LAT IN ALPHAV +4

R0118 OUTPUT

R0119 EARTH RADII IN FRAM AND MPAC (METERS R-29)

0120			13,2466	53545 0	CITEPAD	ELPAD	DSC	
0121	REF 19	LAST 1128	13,2467	02036 1			ALPHAV +4	SIN**2(L)
0122			13,2471	44252 0	SL1	BDSU		
0123	REF 1		13,2471	24305 1		DP1/2		COS**2(L)
0124			13,2472	44275 1	CMFR	PCSL		
0125	REF 1		13,2473	26507 1		FC		
0126	REF 2	LAST 1128	13,2474	24105 1		DF1/2		
0127			13,2475	75465 1	BDDV	SGT		
0128	REF 1		13,2475	26503 0		R2XSC		
0129			13,2477	77622 1	SR4R			
0130	REF 4	LAST 1127	13,2500	03673 0	STCPE	EPALM		
0131			13,2501	77616 1	FVQ			

R01311 THE FOLLOWING CONSTANTS WERE COMPUTED WITH A=6278166, E=6356784 METERS

R01312 R2XSC= P**2/SCALR R-51

R01313 R2/A2= P**2/A**2 SCALR R-1

R01314 FF=(1-P**2/A**2) SCALR R-1

0132			13,2502	01446 1	E2XSC	ZDFC	.0179450685	P**2/SCALR R-51
0133			13,2503	02035 1				
0133	REF 1	LAST 1093	13,2504		DP1/2	=	XLIMIT	
0134			13,2504	17711 1	R2/A2	ZDFC	.5933764884 R-1	GAMMA= P**2/A**2 R-1
0134			13,2505	05254 1				
0135			13,2506	00155 0	EF	ZDFC	6.6625116 E-3	(1-P**2/A**2) R-0
0135			13,2507	25255 1				

1 LATITUDE LONGITUDE SUBROUTINES

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P0137 ARCTAN SUBROUTINE

P0140 CALL TWO SUBROUTINES

P0139 SIN THETA IN SINTH P-1

P0140 COS THETA IN COSTH P-1

P0141 CALL ARCTAN

P0142 CTRPL

P0143 ARCTAN THETA IN ARCTAN THETA -- IN RANGE -1/2 TO +1/2

0144			13,2510	77610	1	ARCTAN	BOV	
0145	REF	1	13,2511	26512	0			CIRDOVFLW
0146			13,2512	62545	0	CIRDOVFLW	FLCAD	DSC
0147	REF	1	13,2513	00523	0			SINTH
0148			13,2514	63525	0		FDCL	DSC
0149	REF	1	13,2515	00521	1			COSTH
0150			13,2516	77615	0		EAC	
0151			13,2517	75464	0		EZF	SGRT
0152	REF	1	13,2520	26526	1			ARCTANXX
0153			13,2521	41165	0		BCDV	BOV
0154	REF	10	13,2522	00522	0			SINTH
0155	REF	1	13,2523	26544	1			ATAN=SG
0156			13,2524	67542	0		SR1	ASIN
0157	REF	4	13,2525	00525	0		STOPE	THETA
0158			13,2526	51125	1		PFCL	BMM
0159	REF	1	13,2527	00521	1			COSTH
0160	REF	1	13,2530	26522	1			NEGCCS
0161			13,2531	43545	1		FLCAD	RVC
0162			13,2532	57545	1	NEGCCS	FLCAD	CCCKF
0163			13,2533	43244	1		RPL	DAD
0164	REF	1	13,2534	26544	1			NECCUT
0165	REF	2	13,2535	24705	1			DPL/2
0166	REF	5	13,2536	10125	0	ARCTANXX	STORE	THETA
0167			13,2537	77616	0		RVC	
0168			13,2540	52225	1	NEGQLT	DSC	GETC
0169	REF	4	13,2541	24005	1			DPL/2
0170	REF	2	13,2542	26536	0			ARCTANXX
0171			13,2543	75345	1	ATAN=SG	FLCAD	SIGA
0172	REF	1	13,2544	11221	1			LCFPI/4
0173	REF	11	13,2545	00523	0			SINTH
0174	REF	6	13,2546	00125	0		STOPE	THETA
0175			13,2547	77616	0		RVC	
0176	REF	2	13,2548			ZCZPC	=	DFZPC

L LATITUDE LONGITUDE SUBROUTINES

USER'S PAGE NO. 6 E4 S3

PG177 SETGAMMA SUBROUTINE

R0178 SUBROUTINE TO SET GAMMA FOR THE LAT-LONG AND LAT-ORV SUBROUTINES

R0179 GAMMA = **2/Δ**2 FOR EARTH (P=1)

R0180 GAMMA = 1 FOR MOON (P=1)

R0181 CALLING SEQUENCE

R0182 L CALL

R0183 I+1 SETGAMMA

R0184 INPUT

R0185 LUNA, LAC=1 FOR EARTH, =1 FOR MOON

R0186 OUTPUT

R0187 GAMMA IN GAMRP (P=1)

0188			13,256	42145 0	SETGAMMA DLOC	R0FF	BRANCH FOR EARTH
0189	RFF	1	13,2561	26505 0		B2/42	EARTH GAMMA
0190	RFF	2 LAST 1127	13,2562	01743 0		LUNAFLAG	
0191	RFF	1	13,2563	26556 0		SETGMEX	
0192			13,2564	77735 0	SLOC		
0193	RFF	1	12,2564	24705 1		1P1	MOON GAMMA
0194	RFF	3 LAST 1127	13,2565	1111 1	SETGMEX	STORE	GAMRP
0195			13,2567	77616 0		PVC	
0196			13,2567		GAMRP	=	RC

L LATITUDE LONGITUDE SUBROUTINES

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R0147 SETRE SUBROUTINE

R0148 SUBROUTINE TO SET RE (EARTH OR MOON RADIUS)

R0149 RE = PM FOR MOON

R0200 RE = REE FOR FIXED EARTH RADIUS (COMPLETED RE FOR FISCHER ELLIPSOID)

R0201 CALLING SEQUENCE

R0202 L CALL

R0203 L+1 SETRE

R1204 SUBROUTINES USED

R0205 SETRAD

R0206 INFLU

R0207 FRACFLAG=0 FOR FIXED RE, 1 FOR COMPLETED RE

R0208 ALPHA+4= 1/2 SINI IF CTRAD IS CALLED

R0209 LUNAFLAG=1 FOR EARTH,=1 FOR MOON

R0210 OUTPUT

R0211 READM= 514PM FOR MOON (METERS E-29)

R0212 READM= FRAD OR COMPLETED RE FOR EARTH (METERS E-29)

0213				13,25	7122	1	SETRE	STC	VLCAD	
0214	REF	1		13,2561	71251	1			SETPRX	
0215	REF	1		13,2562	71203	0			514PM	
0216				13,2562	71214	0		BON	OLCAD	BRANCH FOR MOON
0217	REF	9	LAST 1130	13,2564	71703	1			LUNAFLAG	
0218	REF	1		13,2565	26575	1			TSTRLSM	
0219	REF	1		13,2566	17071	1			FRAD	
0220				13,2567	45714	0		PRFF	CALL	SPACEFLAG=0 FOR FIXED RE, 1 FOR COMPLETED
0221	REF	4	LAST 965	13,257	70742	1			FRACFLAG	
0222	REF	1		13,2571	26573	1			SETPRX	
0223	REF	1		13,2572	26466	1			CTRAD	
0224	REF	8	LAST 1128	13,2572	27672	1	SETPRX	STCALL	EXIT WITH RE OR PM METERS E-29	
0225	REF	2	LAST 1131	13,2574	71251	0			SETPRX	
0226				13,2575	77214	0	TSTRLSM	PRM	VLCAD	SPACEFLAG=1, SET RO=PLS
0227	REF	6	LAST 1131	13,2576	7072	1			FRACFLAG	=1 RO=RM
0228	REF	9	LAST 1131	13,2577	26573	1			SETPRX	
0229	REF	14	LAST 974	13,2578	02023	1			PLS	
0230				13,2581	64446	0		ARVAL	SR2R	SCALE FROM P-27 TO P-29
0231				13,2582	77650	1		CCTC		
0232	REF	3	LAST 1131	13,2582	26573	1			SETPRX	
0233	REF	12	LAST 963	7071			SETPRX	=	S2	

L PLANETARY INITIAL ORBITATION

USF'S PAGE NO. 1 EO 52

R0001 RE-TO-R SUBROUTINE
 R0002 SUBROUTINE TO CONVERT E (VECTOR IN PLANETARY COORDINATE SYSTEM, EITHER
 R0003 EARTH-FIXED OR MOON-FIXED) TO R (SAME VECTOR IN THE BASIC REF. SYSTEM)

R0004 $R = M(1) * (RP + LP * RP)$ $MT = M$ MATRIX TRANSPOSE

R0005 CALLING SEQUENCE
 R0006 1 CALL
 R0007 L+1 RE-TO-R

R0008 SUBROUTINES USED
 R0009 EARTHMX, MOONMX, EARTH

R0010 ITEMS AVAILABLE FROM LALACE DATA
 R0011 504LM= THE ITERATION VECTOR L OF THE MOON AT TIME TIMSLPL, EXPRESSED
 R0012 IN THE MOON-FIXED COORD. SYSTEM RADIANS EO
 R0013 ITEMS NECESSARY FOR SLRP, USED (SEE DESCRIPTION OF SUBR.)

R0014 INPUT
 R0015 MPAC= 0 FOR EARTH, NON-ZERO FOR MOON
 R0016 RP=EO= RP VECTOR
 R0017 G=7C= TIME

R0018 OUTPUT
 R0019 MPAC= R VECTOR METERS PER SEC FOR EARTH, B=27 FOR MOON

0000 REF 1 26,370 SETLOC PLANTING
 0001 26,3716 BANK

0002 REF 2 LAST 52 TO 14: 18 18* COLN1* 54/LFCOT

0003 26,3716 46121 1 RE-TO-R STG B1Z
 0004 REF 1 26,3717 00050 1 RFPFXIT
 0005 REF 1 26,3721 55733 0 RPTORX

0006 26,3721 77624 1 CALL
 0007 REF 1 26,3722 51727 1 MOONMX COMPUTE M MATRIX FOR MOON
 0008 26,3723 77775 1 LP=LM FOR MOON RADIANS EO

0009 REF 1 26,3724 02013 1 VLOAD
 0010 26,3725 52235 0 RPTORB VXV

0011 REF 1 26,3726 02701 0 VAE
 0012 REF 2 LAST 1132 26,3727 00001 0 504RPP
 0013 26,3730 52105 1 504RFP

0014 REF 1 26,3731 00025 0 VXV GTC
 0015 REF 1 26,3732 51715 0 MMAT01X
 0016 26,3733 77624 1 RPTORA CALL RFPXXXX

0017 REF 1 26,3734 55743 1 EARTHMX
 0018 REF 1 26,3735 77624 1 CALL
 0019 REF 1 26,3736 15711 0 EARTH
 0020 REF 2 LAST 1132 26,3737 76521 0 LXV VS11
 0021 26,3740 00025 0 MMATRIX

COMPUTE M MATRIX FOR MOON
 LP=LM FOR MOON RADIANS EO

MPAC=R*M(1) *(RP+LP*RP)
 RESET FUS-LFC TO 0 BEFORE EXITING
 EARTH COMPUTATIONS
 M MATRIX E-1

L VECTOR RADIANS EO
 LP=M(1)*L PAC B-1

PLANETARY INERTIAL ORIENTATION

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1142		26,1741	77680 1
0142	DEF 1	26,1742	55725 1
01432	DEF 1	26,2000	
01434		24,2677	
01436	DEF 1		

GCTC
 SETCORR
 SETLOC PLANTIN
 PANK
 COUNT# 55/LLECT

L PLANETARY INITIAL ORIENTATION

USER'S PAGE NO. 3 END 53

P0044 R-TOR-PP SUPERROUTINE
R0045 SUPERROUTINE TO CONVERT A VECTOR IN REFERENCE COORD. SYSTEM TO AN

R0046 VECTOR IN PLANETARY COORD. SYSTEM) EITHER EARTH-FIXED OR MOON-FIXED

R0047 $R = V(T) * (R - LYR)$

R0048 CALL IN SEQUENCE

R0049 1 CALL

R0050 L+1 R-TOR-PP

R0051 SUPERROUTINES USED

R0052 EARTHXX, MOONXX, EARTH1

R0053 INPUT

R0054 MPAC= 1 FOR EARTH, MOON=ZERO FOR MOON

R0055 5=0= R VECTOR

R0056 6=7= TIME

R0057 ITEMS AVAILABLE FROM LAUNCH DATA

R0058 504LM= THE ORBITATION VECTOR OF THE MOON AT TIME T1MSUBL, EXPRESSED

R0059 IN THE MOON-FIXED COORD. SYSTEM RADIANS RC

R0060 ITEMS NECESSARY FOR SUPERROUTINES USED (SEE DESCRIPTION OF SUBR.)

R0061 OUTPUT

R0062 MPAC=PP VECTOR METERS 1-29 FOR EARTH, 3-27 FOR MOON

0063				24,3677	46220 1	R-TOR-PP	STC	REF1Z	
0064	REF	2	LAST 1132	24,3700	00050 1			REFX1T	
0065	REF	1		24,3711	51721 1			RTORPA	
0066				24,3712	77624 1		CALL		
0067	REF	2	LAST 1132	24,3713	51727 1			MOONXX	
0068				24,3714	61475 1		VLOAD	VX1	
0069	REF	2	LAST 1132	24,3715	02013 1			504LM	LF=LM
0070	REF	3	LAST 1132	24,3716	00025 0			MMATRIX	
0071				24,3717	77772 0				$L=MT(T)*LP$ RADIANS RC
0072				24,3718	51225 1	RTORPP	VSL1	BVSL	
0073	REF	4	LAST 1132	24,3711	00001 0		VXV	504RPR	
0074	REF	4	LAST 1134	24,3712	00001 0			504RPR	
0075				24,3713	77721 0		VXV		$M(T)*(F-LXF)$ F-2
0076	REF	4	LAST 1134	24,3714	00025 0			MMATRIX	
0077				24,3715	40372 0	PPPPXXXX	VSL1	SFTPC	
0078				24,3716	00001 0			QD	
0079				24,3717	77655 1		ECTC		
0080	REF	3	LAST 1134	24,3718	00050 1			REFX1T	
0081				24,3721	77624 1	RTORPA	CALL		EARTH COMPLICATIONS
0082	REF	2	LAST 1132	24,3722	55743 1			EARTHXX	
0083				24,3723	77624 1		CALL		
0084	REF	2	LAST 1132	24,3724	15761 0			EARTH1	
0085				24,3725	77650 1		GCTC		$MPAC=L=(-AX,-AY,0)$ RAD P=0
0086	REF	1		24,3726	51711 0			RTORPP	

L PLANETARY INERTIAL ORIENTATION

LSEB'S PAGE NO. 4 FO S3

P0007 MOONX SUBROUTINE
 P0008 SUBROUTINE TO COMPUTE THE TRANSFORMATION MATRIX M FOR THE MOON

P0009 CALLING SEQUENCE

P0010 L CALL

R0001 L+I MOONX

P0002 SUBROUTINES USED

R0003 NEWANGLE

P0004 INPT

R0005 6-70= T14

P0006 ITEMS AVAILABLE FROM LAUNCH DATA

R0007 BSLBC, BDOT

P0008 T1ASUPC, NODIC, NODOT, FSLBC, FDOT

P0009 COSI= COS(I) B-1

R0010 SINI= SIN(I) B-1

P0011 I IS THE ANGLE (BTW THE MEAN LUNAR EQUATORIAL PLANE AND THE

R0012 PLANE OF THE ECLIPTIC (1 DEGREE 32.1 MINUTES)

P0013 OUTPUT

P0014 M MATRIX= 3X3 M MATRIX B-1 (STORED IN VAC AREA)

P0105			24,3727	40220.0	MOONX	STG	SETPD	
P0106	REF	1	24,3730	40051.0			FARTHMX	
P0107			24,3731	40011.1			BD	
P0108			24,3732	77770.1		AXT,1		B REQUIRES SL 0, SL 5 IN NEWANGLE
P0109			24,3733	00005.1			5	
P0110			24,3734	65345.0		CLCAC	PCDL	PD 100 8-90=BSLBC
P0111	REF	1	24,3735	14017.1			BSUPC	10-110=BDOT
P0112	REF	1	24,3736	14011.1			BDOT	
P0113			24,3737	45005.0		PUSH	CALL	PD 120
P0114	REF	1	24,3740	52712.0			NEWANGLE	EXIT WITH PD 80 AND MPAC= B REVS BD
P0115			24,3741	71415.0		PUSH	COS	PD 120
P0116	REF	1	24,3742	14041.1		STOPL	CCP	PD 80 COS(B) B-1
P0117			24,3743	77756.0		SIN		SIN(P) B-1
P0118	REF	1	24,3744	14043.0		STOPL	SCB	SETUP INPT FOR NEWANGLE
P0119	REF	1	24,3745	14015.0			FSURC	8-90=FSUBC
P0120			24,3746	41525.0		PDDL	PUSH	PD 100 THEN 120 10-110=FDOT
P0121	REF	1	24,3747	14017.0			FDOT	
P0122			24,3750	45170.0		AXT,1	CALL	F REQUIRES SL 1, SL 6 IN NEWANGLE
P0123			24,3751	70004.0			4	
P0124	REF	2 LAST 1135	24,3752	52712.0			NEWANGLE	EXIT WITH PD 80 AND MPAC= F REVS BD
P0125	REF	1	24,3753	14027.1		STOPL	AVCTR +2	SAVE F TEMP
P0126	REF	1	24,3754	14013.1			NODIC	8-90=NODIC
P0127			24,3755	41525.0		PDDL	PUSH	PD 100 THEN 120 10-110=NODOT
P0128	REF	1	24,3756	14015.1			NODOT	MPAC=T
P0129			24,3757	45170.0		AXT,1	CALL	NODE REQUIRES SL 0, SL 5 IN NEWANGLE
P0130			24,3758	70005.1			5	
P0131	REF	3 LAST 1135	24,3759	52712.0			NEWANGLE	EXIT WITH PD 80 AND MPAC= NODI REVS BD

L PLUINARY INITIAL COORDINATION

LSEPI'S PAGE NO. 5 FC 52

0132			24,3762	71474 1	FLSH	CCF	FC 10C	8-9C= NCCI REVS EO
0133			24,3763	77606 1	PUSH		PD 12C	1C-11D= CCS(NCCI) E-1
0134	REF	2	LAST 1135	24,3764	00025 0	STORE	AVECTR	
0135			24,3765	76475 1	DMP	SLIR		
0136	REF	2	LAST 1135	24,3766	00041 1	CCP		CCS(NCCI) B-1
0137	REF	1		24,3767	14135 1	STEEL	BVECTR +2	FC 10C 2C-25C=AVECTR= COS*SIN(NCCI)
0138			24,3770	76475 1	DMP	SLIP		SCF*SIN(NCCI)
0139	REF	2	LAST 1135	24,3771	00043 1	SCP		
0140	REF	2	LAST 1136	24,3772	14037 0	STEEL	BVECTR +4	FC 8C
0141			24,3773	41556 1	SIN	PLSH		PD 10C
0142			24,3774	52376 1	CCCMF	GETC		-SIN(NCCI) E-1
0143	REF	1		24,3775	52363 1	MCCNMXA		26-31C=BVECTR= COS*CCS(NCCI)
01475			25,3633		BANK	25		
01476	REF	1		25,2000	SFTLCC	PLANTIN3		
01477			25,3633		BANK			
01478	REF	1			COUNT4	44/LUPNT		
0148	REF	3	LAST 1136	25,3633	14133 1	MCCNMXA	STEEL	BVECTR
01491	REF	3	LAST 1136	25,3634	00027 1		AVECTR +2	FC 3C
01492	REF	1		25,3635	14037 0	STEEL	504F	MOVE F FROM TRMP LCC. TC 504F
01493			25,3636	76405 1	DMP	SLIR		
01494	REF	3	LAST 1136	25,3637	00041 1	CCP		
01495	REF	4	LAST 1136	25,3640	14027 1	STEEL	AVECTR +2	
0149	REF	1		25,3641	00011 1	SIN(NCCI)		8-9C=SIN(NCCI) E-1
0150			25,3642	76405 1	DMP	SLIP		
0151	REF	3	LAST 1136	25,3643	00043 0	SCP		
0152	REF	5	LAST 1136	25,3644	14031 0	STEEL	AVECTR +4	0
0153	REF	12	LAST 1136	25,3645	0524 1	HIGZECS		P-13D= CVECTR= -SCB B-1
0154			25,3646	57525 1	PDCL	CCCMF		FC 10C
0155	REF	4	LAST 1136	25,3647	00043 0	SCP		CCP
0156			25,3651	62325 0	PDCL	PCVI		FC 12C THEN PC 14C
0157	REF	4	LAST 1136	25,3651	00041 1	CCP		
0158	REF	4	LAST 1136	25,3652	00033 1	BVECTR		
0159			25,3653	63361 0	VXSC	PPVL		FC 20C
0160	REF	1		25,3654	14033 1	SINI		BVECTR*SINI B-2
0161	REF	1		25,3655	00011 1	CVECTR		
0162			25,3656	53361 0	VXSC	VAD		FC 14C
0163	REF	1		25,3657	14031 0	CCSI		CVECTR*COSI B-2
0164			25,3660	77772 0	VSL1			
0165	REF	5	LAST 1136	25,3661	24041 1	STOVL	MATRIX +12C	FC 8D
0166			25,3662	63361 0	VXSC	PPVL		*2=BVECTR*SINI+CVECTR*CCSI E-1
0167	REF	2	LAST 1136	25,3663	14033 1	SINI		PD 14D
0168	REF	5	LAST 1136	25,3664	00033 1	BVECTR		CVECTR*SINI B-2
0169			25,3665	52361 1	VXSC	VSU		FC 8D
0170	REF	2	LAST 1136	25,3666	14001 0	CCSI		BVECTR*CCSI B-2
0171			25,3667	65372 1	VSL1	PDCL		PD 14C
0172	REF	2	LAST 1136	25,3670	00037 0	504F		8-13D=BVECTR=VECTR*CCSI-CVECTR*SINI B-1
0173			25,3671	74346 0	COS	VXSC		
0174	REF	1		25,3672	00011 1	BVECTR		
0175			25,3673	72525 1	PDCL	SIN		FC 20C 14-19C= CVECTR*CCSF B-2

L PLANETARY INERTIAL ORIENTATION

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0176	REF	2	LAST 1126	25,3674	00017 0		5C4F	
0177				25,3675	52361 1	VXSC	V5U	FC 14C AVECTR*SINF B-2
0178	REF	6	LAST 1136	25,3676	00025 0		AVECTR	
0179				25,3677	77772 0	VSL1		
0180	REF	6	LAST 1126	25,3700	14033 1	STCCL	MMATRIX +6	M1= AVECTR*SINF-CVECTR*CCSF B-1
0181	REF	4	LAST 1137	25,3711	00117 0		5C4F	
0182				25,3702	74356 1	SIN	VXSC	FC 8C
0183				25,3713	71525 0	PDDL	CCS	FC 14C B-13C=AVECTR*SINF B-2
0184	REF	5	LAST 1137	25,3714	01007 0		5C4F	
0185				25,3715	52361 0	VXSC	VAD	FC 8C AVECTR*CCSF B-2
0186	REF	7	LAST 1137	25,3716	01025 0		AVECTR	
0187				25,3717	57572 0	VSL1	VCCMP	
0188	REF	7	LAST 1137	25,3718	44025 1	STCALL	MMATRIX	M2= -(AVECTR*CCSF+VECTR*SINF) B-1
0189	REF	2	LAST 1135	25,3711	00051 0		FARTHMAX	
0190	COMPUTE X=X0+(XCCT)*(T+T0)							
0191	B-9C= XC (PEVS B-1), PUSH TO SET AT 12C							
0192	1-11C=XCCT (PEVS/CSEC) SCALED B+23 FOR WEARTH, B+28 FOR MOODT AND BDOT							
0193	AND B+27 FOR FCCT							
0194	X1=DIFFERENCE IN 23 AND SCALING OF XCCT, 0 FOR WEARTH, 5 FOR MOODT AND							
0195	BDOT AND 4 FOR FCCT							
0196	6-7D=T (CSEC B-28), TIMSLBC= (CSEC B-42 TRIPLE FREQ.)							
0197				25,3712	54445 1	NEWANCLF DLOAD	SR	ENTER PC 14C
0198				25,3713	00007 0		6C	
0199				25,3714	20617 0		14C	
0200				25,3715	72371 1	TAC	TLOAD	CHANGE MODE TO TP
0201	REF	1		25,3716	01777 0		TIMSLBC	
0202	R T 733	LAST 1130		25,3717	00155 0		MFAC	
0203	F	1		25,3720	14017 1	STCCL	TIMSUBM	T+T0 CSEC B-42
0204	REF	2	LAST 1137	25,3721	00020 0		TIMSLM +1	
0205				25,3722	77555 1	DMP		PD 10C MULT BY XCCT IN 10-11C
0206				25,3723	43257 0	SL*	DAL	PD 8D ACC XC IN B-9C AFTER SHIFTING
0207				25,3724	21206 1		5,1	SUCH THAT SCALING IS B-0
0208				25,3725	67276 1	PUSH	SLOAD	PD 10C SAVE PARTIAL (XC+XCCT*T) IN B-9C
0209	REF	2	LAST 1137	25,3726	0017 1		TIMSUBM	
0210				25,3727	41261 1	SI	DMP	
0211				25,3728	20212 1		9C	
0212				25,3729	00013 0		14C	XCCT
0213				25,3732	43257 0	SL*	DAL	PD 8D SHIFT SUCH THAT THIS PART OF X
0214				25,3733	21213 0		10C,1	IS SCALED REVS/CSEC B-C
02141				25,3734	77602 1	RDV		TURN OFF OVERFLOW IF SET BY SHIFT
02142				25,3735	53136 0		+1	INSTRUCTION BEFORE EXITING
0215				25,3736	77616 0	RDV		MFAC=X0+(XCCT)*(T+T0) PEVS B0

L PLANETARY INERTIAL ORIENTATION

LSFR'S PAGE NO. 7 FD 53

R0216 EARTHXX SUPPDLTINE
 R0217 SUPPDLTINE TO COMPUTE THE TRANSFORMATION MATRIX M FOR THE EARTH

R0218 CALLING SEQUENCE

R0219 L CALL

R0220 I+1 EARTHXX

R0221 SUPPDLTINE USED

R0222 NEWANGLE

R0223 INPUT

R0224 INFLT AVAILABLE FROM LAUNCH DATA

AZC REVS E=0

R0225

TEPHEN CSFC P=42

R0226 A-TD= TIME CSFC E=28

R0227 OUTPUT

R0228 MMATRIX= 3X3 M MATRIX E-I (STORED IN VAC AREA)

R02282 26,3743 BANK 2A
 R02284 REF 2 LAST 1132 26,3743 SFILCC PLANTINI
 R02286 26,3743 BANK
 R02288 REF 3 LAST 1132 TO 1134: 21 394 COUNT# 11/LURDT

R0229 26,3743 40220 1 EARTHXX STG SETPD
 R0230 REF 3 LAST 1137 26,3744 10051 0 EARTHXX
 R0231 26,3745 10011 1 R0
 R0232 26,3746 77770 1 AXT,1
 R0233 26,3747 00000 1 0
 R0234 26,3748 65345 0 DLCC PDOL

R0235 REF 1 26,3751 01712 1 AZ
 R0236 REF 1 26,3752 14121 1 WEARTH
 R0237 26,3753 45026 0 PLSH CALL
 R0238 REF 4 LAST 1135 26,3754 53712 0 NEWANGLE
 R0239 26,3755 41401 1 SETPD PLSH

R0240 26,3756 00023 0 180
 R0241 26,3757 65346 0 COS PDOL
 R0242 REF 1 26,3760 00023 0 504AZ

R0243 26,3761 65356 1 SIN PDOL
 R0244 REF 14 LAST 1136 26,3762 06524 1 HI6ZFRCS
 R0245 26,3763 73525 1 PDOL SIN

R0246 REF 2 LAST 1138 26,3764 00023 0 504AZ
 R0247 26,3765 65276 1 DLCCF PDOL
 R0248 REF 3 LAST 1138 26,3766 00023 0 504AZ

R0249 26,3767 63346 0 COS PDOL
 R0250 REF 15 LAST 1138 26,3770 06524 1 HI6ZFRCS
 R0251 26,3771 41525 0 PLSH

R0252 REF 5 LAST 450 26,3772 06522 1 HI6ZFRCS
 R0253 26,3773 77450 1 GCTC
 R0254 REF 4 LAST 1138 26,3774 10051 0 EARTHXX

SET 8-9D=AZC

10-11C=WEARTH
 FOR SL 5, AND SL 10 IN NEWANGLE

LEAVING PD SET AT 12C FOR NEWANGLE

18-19C=504AZ

COS(AZ) SIN(AZ) 0
 20-27C= MMATRIX= -SIN(AZ) COS(AZ) 0 E-1
 0 0 1

L PLANETARY INERTIAL CRISTITATION

USER'S PAGE NO. 8 EC 53

R0255 PARTIAL SUPPORTING
 R0256 SUPPORTING TO COMPLETE L VECTOR FOR EARTH

R0257 CALLING SEQUENCE
 R0258 L CALL
 R0259 L+1 EARTH

R0260 INPUT
 R0261 AX0,AY0 SET AT LAUNCH TIME WITH AY0 IMMEDIATELY FOLLOWING AX0 IN CORE

R0262 OUTPUT
 R0263 - AX
 R0264 *FAC= -AY FAC1MS R-1
 R0265 0

R026505		06,2761	BANK 06
R02651	REF 1	06,2761	SETLOC EARTHLOC
R026515		06,2761	BANK
R02652	REF 1		COUNT* 55/LUPDT

R0266		06,3761	57545 1	EARTH	ELFAC DCOMP
R0267	REF 1	06,3762	01716 0		AX0
R0268	REF 1	06,3763	14017 1		STOCL 504LPL
R0269	REF 1	06,3764	01714 1		-AY0
R0270	REF 2	06,3765	14021 1		STOCL 504LPL +2
R0271	REF 4	06,3766	24007 0		LC6ZFROS
R0272	REF 3	06,3767	24023 0		STOVL 504LPL +4
R0273	REF 4	06,3770	00017 1		504LPL
R0274		06,3771	77616 0		FVC

L PLANETARY INERTIAL ORIENTATION

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P0275 CONSTANTS AND FRASABLE ASSIGNMENTS

0276	REF 5	LAST 1129	12,274	181	=	DF1/2
0279	REF 13	LAST 1130	0150	RPRFXIT	=	S1
0280	REF 12	LAST 1131	0151	EARTHXX	=	S2
0281				504PPP	=	00
0282			1	SINNOCI	=	90
0283			010	CVCTP	=	80
0284			010	CVCTP	=	80
0285			022	504A7	=	100
0286			016	TINSLPM	=	140
0287			016	504LPL	=	140
0288			024	AVECTR	=	200
0289			032	BVECTR	=	260
0290			0024	MATRIX	=	200
0291			0040	CCP	=	320
0292			042	SDR	=	340
0293			016	504F	=	60

1	SCALED R-1
P-TO-PP	AND PP-TO-R SLER EXIT
EARTHXX, MOONXX	SUPP. EXITS
6 REGS	F OR PP VECTOR
2	SIN(MODI)
6	C VECTOR MOON
6	C VECTOR MOON
2	AZ
3	TIME SUP M (MOON) T+TO IN GETAZ
6	L OR LP VECTOR
6	A VECTOR (MOON)
6	E VECTOR (MOON)
18	M MATRIX
2	COS(B) R-1
2	SIN(B) R-1
2	F (MOON)

L MEASUREMENT INCORPORATION

USER'S PAGE NO. 1 EQ S3

RC001 INCORP1--PERFORMS THE SIX DIMENSIONAL STATE VECTOR DEVIATION FOR POSITI
 R0002 ON AND VELOCITY. P THE SIX DIMENSIONAL DEVIATION OF POSITION, VELOCITY, A
 R0003 ND RADAR OR LANDMARK PLS. THE OUTPUT OF THE VECTOR ROUTINE ALONG WITH T
 R0004 HE PROCP TRANSITION MATRIX (W) ARE USED AS INPUT TO THE RCLTNE. THE DEVI
 R0005 TION IS OBTAINED BY COMPUTING AN ESTIMATED TRACKING MEASUREMENT FROM THE
 R0006 CURRENT STATE VECTOR AND COMPARING IT WITH AN ACTUAL TRACKING MEASUREMEN
 R0007 T AND APPLYING A STATISTICAL WEIGHTING VECTOR.

R0008 INPUT

R0009 OMNIFLG = 0 6 DIMENSIONAL VECTOR 1= 9 DIMENSIONAL

R0010 W = PROCP TRANSITION MATRIX 6X6 OR 9X9

R0011 VARIANCE = VARIANCE (SCALAR)

R0012 FTLTD = MEASURED DEVIATION (SCALAR)

R0013 VECTOR = 6 OR 9 DIMENSIONAL VECTOR

R0014 OUTPUT

R0015 DELTAX = STATE VECTOR DEVIATIONS 6 OR 9 DIMENSIONAL

R0016 ZI = VECTOR USED FOR THE INCORPORATION 6 OR 9 DIMENSIONAL

R0017 GAMMA = SCALAR

R0018 OMFCA = OMFCA WEIGHTING VECTOR 6 OR 9 DIMENSIONAL

R0019 CALLING SEQUENCE

R0020 L CALL INCORP1

R0021 ADEVAL EXIT

R0022 L+1 OF CALLING SEQUENCE

0023 27,3452

0024 REF 1 23,2406

0025 23,2533

BANK 37

SETLOC MEASING

BANK

0026 REF 1

COUNT \$\$\$/INCOR

0027 REF 18 LAST 613 55,14 11

FRANK= W

0028 23,2523 77620 0 INCORP1

0029 REF 2 LAST 127 23,2534 02772 1

0030 23,2535 66370 0

STG

EGRESS

AXT, I

SSP

0031 23,2536 00066 1

54D

0032 REF 14 LAST 1140 23,2537 00051 0

0033 23,2540 00022 1

0034 23,2541 66374 1

0035 23,2542 00022 1

S1

18D

SSP

18D

S2

0036 REF 14 LAST 1140 23,2543 00052 0

0037 23,2544 00006 1

0038 23,2545 63775 1

0039 REF 22 LAST 595 23,2546 02525 0

0040 REF 19 LAST 1141 23,2547 02467 0

0041 REF 2 LAST 127 23,2550 12665 1

0042 23,2551 77775 1

0043 REF 23 LAST 1141 23,2552 13533 1

6

VLOAD

WV*

EVECTOR

W + 54D, 1

STREF

ZI + 18D, 2

VLOAD

BVECTOR + 6

EVECTOR (1)

IX1 = 54 S1 = 18

IX2 = 18 S2 = 6

L M ASSEMBLY INSTRUCTIONS

LSEF'S PAGE NO. 2 FF 53

0044			23,2553	52717 1	MOV*	VAF*	
0045	REF	20	LAST 1141	23,2554	02555 1	W +100,1	
0046	REF	3	LAST 1141	23,2555	75112 1	Z1 +100,2	
0047	REF	4	LAST 1142	23,2556	12665 1	STORE	Z1 +100,2
0048				23,2557	77775 1	VLOAD	
0049	REF	24	LAST 1141	23,2558	02541 1	EVECTOR +120	EVECTOR (2)
0050				23,2559	52717 1	MOV*	VAF*
0051	REF	21	LAST 1142	23,2560	02643 1	W +1620,1	
0052	REF	5	LAST 1142	23,2561	75112 1	Z1 +100,2	P(0)*W+P(1)*(W+54)+P(2)*(W+108) FIRST PAS
0053	REF	6	LAST 1142	23,2562	12665 1	STORE	Z1 THEN Z2 THEN Z3
0054				23,2563	77770 0	TIx,1	
0055	REF	1		23,2564	46567 1	INCR01	
0056				23,2565	43114 0	TIx,2	
0057	REF	1		23,2570	46545 1		LCCF FOR Z1,Z2,Z3
0058	REF	3	LAST 587	23,2571	77776 1	DMFHLG	
0059	REF	1		23,2572	46576 1	INCR10	
0060				23,2573	77775 1	VLOAD	
0061	REF	17	LAST 913	23,2574	06524 1	ZEROVCS	
0062	REF	7	LAST 1142	23,2575	12657 1	STORE	Z1 +120
0063				23,2576	77271 1	SETPC	
0064				23,2577	00001 0		
0065	REF	8	LAST 1142	23,2578	02643 1	Z1	
0066				23,2579	47336 1	VSD	
0067	REF	6	LAST 586	23,2580	21634 1	TEMPOR	
0068				23,2581	47515 1	FDVL	VSC
0069	REF	9	LAST 1142	23,2582	02651 1	Z1 +6	
0070				23,2583	76234 1	RTR	TAC
0071	REF	7	LAST 1142	23,2584	21634 1	TEMPOR	
0072				23,2585	47515 1	FDVL	VSC
0073	REF	10	LAST 1142	23,2586	02657 1	Z1 +120	
0074				23,2587	76234 1	RTR	TAC
0075	REF	8	LAST 1142	23,2588	21634 1	TEMPOR	
0076				23,2589	77171 1	TAC	AXT,2
0077	REF	11	LAST 586	23,2590	02707 0	VARIANCE	
0078				23,2591	00000 1		
0079	REF	2	LAST 127	23,2592	02665 0	STORE	TRIPLA
0080				23,2593	40151 0	TLOAD	BCV
0081	REF	12	LAST 1142	23,2594	02707 0	VARIANCE	CLEAR CVFIND
0082				23,2595	46522 0	+1	
0083	REF	1		23,2596	02670 1	STORE	TEMPVAR
0084				23,2597	77654 1	PZE	TEMP STORAGE FOR VARIANCE
0085	REF	1		23,2598	46633 0		INCR10
0086				23,2599	40112 1	INCR10	RCV
0087	REF	2	LAST 1142	23,2600	46633 0		INCR10
0088	REF	2	LAST 1142	23,2601	02670 1	STORE	TEMPVAR
0089				23,2602	52114 1	INCR,2	GTC
0090				23,2603	00001 1	DFC	1
0091	REF	1		23,2604	46625 1	INCR10	INCR10
0092				23,2605	61551 1	INCR10	PCUND
0093	REF	3	LAST 1142	23,2606	02665 0	TLOAD	TRIPLA

L MEASUREMENT INCORPORATION

USER'S PAGE NO. 3 FE 53

0104
 0055 REF 3 LAST 1142 23,2635 75405 1
 0106 23,2636 12673 1
 0107 23,2637 76257 0
 0058 REF 4 LAST 1142 24,2641 57576 1
 0109 23,2641 72565 0
 0110 23,2642 62101 1
 0111 23,2643 00050 1
 0112 23,2644 77775 1
 0113 23,2645 77124 1
 0114 REF 2 LAST 115 23,2646 02113 1
 0115 23,2647 00242 1
 0116 23,2651 40265 1
 0117 REF 7 LAST 913 23,2651 06514 1
 0118 23,2652 60001 0
 0119 REF 2 LAST 146 23,2653 12501 1
 0120 23,2654 60351 0
 0121 REF 5 LAST 1142 23,2655 12665 0
 0122 REF 35 LAST 1080 23,2656 00147 1
 0123 23,2657 65345 0
 0124 REF 734 LAST 1137 23,2661 00155 0
 0125 REF 8 LAST 586 23,2661 13547 1
 0126 23,2662 77711 1
 0127 REF 15 LAST 1141 23,2663 00051 0
 0128 23,2664 70460 1
 0129 REF 16 LAST 1143 23,2665 00050 1
 0130 23,2666 41471 0
 0131 23,2667 77651 1
 0132 REF 1 23,2671 45711 1
 0133 REF 15 LAST 1141 23,2671 77731 1
 0134 23,2672 00052 0
 0135 23,2673 00766 1
 0136 23,2674 60775 1
 0137 REF 11 LAST 1142 23,2675 02643 1
 0138 REF 22 LAST 1142 23,2676 75134 0
 0139 23,2677 77206 0
 0140 REF 12 LAST 1143 23,2701 02651 1
 0141 23,2701 53303 1
 0142 REF 23 LAST 1143 23,2712 75112 1
 0143 23,2713 77206 0
 0144 REF 13 LAST 1143 23,2714 02657 1
 0145 23,2715 53303 1
 0146 23,2716 75770 1
 0147 REF 1 23,2717 61006 0
 0148 23,271 46674 0
 0149 23,2711 45575 1
 0150 REF 2 LAST 146 23,2712 74260 0
 0151 23,2713 45575 1
 0152 REF 3 LAST 1143 23,2714 74256 0
 0153 23,2715 45575 1
 0154 REF 4 LAST 1143 23,2716 74274 0

CMP SQRT
 TEMPVAR
 SL* TAD
 0,2
 TRIPA
 NCRM TACR,2
 X2
 DEC -2
 SXA,2 AXI,2
 NORMMGAM
 1620
 BDDV SETPD
 DP1/4TH
 0
 STORE GAMMA
 TLCAO ACM
 TRIPA
 X1
 CLCAO POOL
 MFAC
 DFLTAG
 NCRM
 S1
 XSU,1 SR1
 S1
 CLV PLSH
 CCTC
 AEWZCMP
 -3 SSP
 S2
 540
 VICAO VXM*
 ZI
 W +1620,2
 PLSH VLCAD
 ZI +6
 VXM* VAD
 W +1800,2
 PUSH VLCAD
 ZI +120
 VXM* VAD
 W +1950,2
 PLSH TIX,2
 INCCR2
 VLCAD STADR
 STORE CMFGA +120
 VLCAD STADR
 STORE CMFGA +6
 VLCAD STADR
 STORE CMFGA

ACORMALIZATION COUNT -2 FOR GAMMA

FD 0-1 = NCRM (A)

FD 0-1 = DFLTAG/A

INCCR2

COMPUTE CMFGA1,2,3

FD 2-7=CMFGA1,8-13=CMFGA2,14-19=CMFGA3

L MEASUREMENT INCORPORATION

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0142				23,2717	77214 1	PCN	VLCAC	
0143	OFF	4	LAST 1142	23,2720	02716 1		DMENFLG	
0144	OFF	1		23,2721	46724 1		INCCP2AP	
0145	OFF	18	LAST 1142	23,2722	06524 1		ZFFCVFCS	
0146	OFF	5	LAST 1142	23,2723	03517 1	STORE	DELTA +120	
0147				23,2724	66374 1	INCCP2AP	AXT,2	SSP
0148				23,2725	00022 1			180
0149	OFF	16	LAST 1142	23,2726	00052 0			S2
0150				23,2727	00006 1			6
0151				23,2730	77772 1	INCCP2	VLOAC*	
0152	OFF	6	LAST 1144	23,2731	74252 1		DELTA +180,2	
0153				23,2732	53761 1	VXSC	VSL*	
0154				23,2733	00001 0		0	DELTAQ/A
0155				23,2734	20201 1		0,1	
0156	OFF	5	LAST 1144	23,2735	12717 1	STORE	DELTA +180,2	
0157				23,2736	77304 0	TIX,2	VLCAC	
0158	OFF	1		23,2737	46730 1		INCCP3	
0159	OFF	6	LAST 1144	23,2740	02673 1		DELTA +6	
0160				23,2741	77732 1	VSL3		
0161	OFF	7	LAST 1144	23,2742	02673 1	STORE	DELTA +6	
0162				23,2743	77650 1	CONT		
0163	OFF	2	LAST 1141	23,2744	02772 1		DELTA	

L MEASUREMENT INTERPRETATION

USER'S PAGE NO. 5 F5 S3

R0164 INCORP2 - INCORPORATES THE COMPUTED STATE VECTOR DEVIATIONS INTO THE
 R0165 ESTIMATED STATE VECTOR. THE STATE VECTOR UPDATED MAY BE FOR EITHER THE
 R0166 LEM OR THE CSM. DETERMINED BY FLAG VEHUFFIC. (ZERO = LEM) (1 = CSM)
 R0167 INPUT
 R0168 PERMANENT STATE VECTOR FOR EITHER THE LEM OR CSM
 R0169 V EPOCH = EPOCH VECTOR (0=LEM 1=CSM)
 R0170 W = EPOCH TRANSITION MATRIX
 R0171 WITAX = COMPUTED STATE VECTOR DEVIATIONS
 R0172 DIMENLG = SIZE OF W MATRIX (2*20 = 4X6) (1=9X9)
 R0173 GAMMA = SCALAR FOR INTERPOLATION
 R0174 ZI = VECTOR USED IN INTERPOLATION
 R0175 WPCA = WEIGHTING VECTOR

R0176 OUTPUT
 R0177 UPDATED PERMANENT STATE VECTOR

R0178 CALLING SEQUENCE
 R0179 1 CALL INCORP2

R0180 NORMAL EXIT
 R0181 1+1 OF CALLING SEQUENCE

0182 REF 1 23,2741 SETLOC MEASINCL
 0183 23,2746 BANK

0184 REF 2 LAST 1141 TO 1145: 138 138* COUNT* 41/INCCR

0185		23,2746	45720 1	INCORP2	STC	CALL	
0186	REF 4	LAST 1144	23,2746	2772 1		GRESS	
0187	REF 27	LAST 790	23,2747	27412 0		INSTALL	
0188			23,2750	74375 0	VLCAD	VXSC	CALC. GAMMA * OMEGA1,2,3
0189	REF 7	LAST 1144	23,2751	03512 1		OMEGA	
0190	REF 3	LAST 1143	23,2752	03511 1		GAMMA	
0191	REF 2	LAST 127	23,2753	26712 0	STOVL	OMEGAM1	
0192	REF 8	LAST 1145	23,2754	03511 1		OMEGA +6	
0193			23,2755	77761 1	VXSC		
0194	REF 4	LAST 1145	23,2756	03510 1		GAMMA	
0195	REF 2	LAST 127	23,2757	26721 1	STOVL	OMEGAM2	
0196	REF 9	LAST 1145	23,2760	03517 1		OMEGA +120	
0197			23,2761	77761 1	VXSC		
0198	REF 5	LAST 1145	23,2762	03500 1		GAMMA	
0199	REF 2	LAST 127	23,2763	02727 1	STOVL	OMEGAM3	
0200			23,2764	77776 1	EXIT		
0201	REF 1		23,2765	3 2246 1	CAF	54CD	INITIAL 1X 1 SETTING FOR W MATRIX
0202	REF 1		23,2766	55'315 0	TS	WIXA	
0203	REF 1		23,2767	55'316 0	TS	WIXB	
0204	REF 226	LAST 1120	23,2770	2 4755 1	CAF	ZFC	
0205	REF 1		23,2771	55'317 1	TS	ZIXA	INITIAL 1X 2 SETTING FOR 2 COMPONENT
0206	REF 1		23,2772	55'320 0	TS	ZIXB	
0207	REF 114	LAST 972	23,2773	2 5353 1	TC	PHASCHNG	

L M ASSEMBLY INCOMPORATION

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0208				23,2774	04022 0	CCT	14022	
0209	PFF	08	LAST	975	23,2775	05534 0	TC	UPFLAG
0210	PFF	2	LAST	711	23,2776	07236 0	ADPES	3EINTFLE
0212	PFF	2	LAST	1145	23,2777	21316 1	CA	W1XB
0213	PFF	2	LAST	1145	23,3000	551315 0	TS	W1XA
0214	PFF	2	LAST	1145	23,3001	31320 1	CA	Z1XB
0215	PFF	2	LAST	1145	23,3002	551317 1	TS	Z1XA
0216	PFF	221	LAST	1015	23,3003	06042 1	TC	INTPRET
0217					23,3004	72150 1	LXA,1	LXA,2
0218	PFF	3	LAST	1146	23,3005	01315 1		W1XA
0219	PFF	3	LAST	1146	23,3006	01317 0		Z1XA
0220					23,3007	70721 0	SSP	DLCA*#
0221	PFF	17	LAST	1142	23,3010	00051 0		S1
0222					23,3011	00054 1		6
0223	PFF	14	LAST	1142	23,3012	75124 0		Z1,2
0224					23,3013	60276 1	DCOMP	NORM
0225	PFF	17	LAST	1144	23,3014	00052 0		S2
0226					23,3015	65161 1	VXSC	XCHX,2
0227	PFF	2	LAST	1145	23,3016	02713 0		DMFGAM1
0228	PFF	18	LAST	1146	23,3017	00051 0		S2
0229					23,3020	57144 1	LXC,2	XAF,2
0230	PFF	2	LAST	1142	23,3021	00047 1		X2
0231	PFF	3	LAST	1143	23,3022	02173 1		NCFMGAM
0232					23,3023	05057 0	VSL*	XCHX,2
0233					23,3024	57576 1		0,2
0234	PFF	10	LAST	1146	23,3025	00051 0		S2
0235					23,3026	77553 1	VAD*	
0236	PFF	25	LAST	1142	23,3027	02467 0		W +540,1
0237					23,3030	02735 1	STORE	HOLDW
0238					23,3031	57543 1	DLCA*#	DCOMP
0239	PFF	15	LAST	1146	23,3032	75134 0		Z1,2
0240					23,3033	74301 0	NORM	VXSC
0241	PFF	2	LAST	1146	23,3034	00052 0		S2
0242	PFF	3	LAST	1145	23,3035	02721 1		DMFGAM2
0243					23,3036	71124 0	XCHX,2	LXC,2
0244	PFF	21	LAST	1146	23,3037	00051 0		S2
0245	PFF	21	LAST	1146	23,3038	00047 1		X2
0246					23,3041	53674 1	XAL,2	VSI*
0247	PFF	4	LAST	1146	23,3042	02107 1		DMFGAM
0248					23,3043	57576 1		0,2
0249					23,3044	52724 1	XCHX,2	VAF*
0250	PFF	22	LAST	1146	23,3045	00051 0		S2
0251	PFF	26	LAST	1146	23,3046	02555 0		W +1080,1
0252	PFF	2	LAST	1146	23,3047	02743 0	STORE	HOLDW +6
0253					23,3050	77614 1	ROFF	
0254	PFF	5	LAST	1144	23,3051	02746 0		DMENFLC
0255	PFF	1			23,3052	47772 1		FAZB
0256					23,3053	57543 1	DLCA*#	DCOMP
0257	PFF	16	LAST	1146	23,3054	75134 0		Z1,2
0258					23,3055	74301 0	NORM	VXSC

START FIRST PHASE OF INCORP2
TO UPDATE A C3 9 DIM. W MATRIX IN TEMP

CALC UPPER 3XS PARTITION OF W MATRIX

CALC MIDDLE 3XS PARTITION OF W MATRIX

BRANCH IF 6 DIMENSIONAL

CALC LOWER 3XS PARTITION OF W MATRIX

MEASUREMENT INCORPORATION

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0259	REF	23	LAST	1146	23,3156	60552 0		S2	
0260	REF	3	LAST	1146	23,3157	62727 1		OMEGAM3	
0261					23,3160	71124 0	XCFX,2	LXC,2	
0262	REF	24	LAST	1147	23,3161	62551 0		S2	
0263	REF	22	LAST	1146	23,3162	00047 1		X2	
0264					23,3163	53674 1	XAC,2	VSL*	
0265	REF	4	LAST	1146	23,3164	62102 1		ACFMCAM	
0266					23,3165	57576 1		1,2	
0267					23,3166	52724 1	XCFX,2	VAC*	
0268	REF	25	LAST	1147	23,3167	60551 0		S2	
0269	REF	27	LAST	1146	23,3167	62643 1		W +162D,1	
0270	REF	4	LAST	1146	23,3171	62751 0	STCRF	HCLPW +12C	
0271					23,3172	77624 1	CALL		
0272	REF	16	LAST	587	23,3172	11226 1	FAZP	GRP2FC	
0273					23,3174	77776 1	EXIT		
0274	REF	4	LAST	1146	23,3175	61315 1	FAZP1	CA	W1XA
0275	REF	1			23,3176	63247 0		AD	60D
0276	REF	3	LAST	1146	23,3177	55216 0		TS	W1XR
0277		4	LAST	1146	23,3181	61317 0		CA	Z1XA
0278	REF	2	LAST	220	23,3181	61751 0		AD	MINUS2
0279	REF	3	LAST	1146	23,3182	55120 0		TS	Z1XR
0280	REF	222	LAST	1146	23,3183	06742 1		TC	INTPRFT
0281					23,3184	66350 1	IXA,1	SSP	
0282	REF	5	LAST	1147	23,3185	61315 1		W1XA	
0283	REF	18	LAST	1146	23,3186	60751 0		S1	
0284					23,3187	62506 1		6	
0285					23,3188	77775 1	VI0AD		
0286	REF	5	LAST	1147	23,3188	62735 1		HCLPW	
0287	REF	23	LAST	1147	23,3188	66467 1	STORE	W +54D,1	
0288					23,3189	77775 1	VLCAC		
0289	REF	6	LAST	1147	23,3184	62742 0		HCLPW +6	
0290	REF	20	LAST	1147	23,3185	66555 1	STORE	W +10FD,1	
0291					23,3186	77214 0	PRFF	VLCAC	
0292	REF	6	LAST	1146	23,3187	62746 0		OMFACLG	
0293	REF	1			23,3188	47131 0		FAZRS	
0294	REF	7	LAST	1147	23,3181	62751 0		HCLPW +12C	
0295	REF	30	LAST	1147	23,3182	66443 0	STORE	W +162D,1	
0296					23,3183	52100 1	FAZP2	TIX,1	
0297					23,3184	47126 1		+2	
0298	REF	1			23,3185	47136 0		FAZC	
0299					23,3186	77674 0	RTP		
0300	REF	1			23,3187	46772 0		FAZA	
0301					23,3188	43335 0	FAZB5	SLOAD	
0302	REF	4	LAST	1147	23,3181	61321 0		Z1XR	
0303	REF	1			23,3182	62751 0		12FD	
0304					23,3183	52533 0	EFIZ	GCTC	
0305	REF	2	LAST	1147	23,3184	47176 0		FAZC	
0306	REF	1			23,3185	47123 1		FAZB2	
0307					23,3186	77624 1	FA7C	CALL	
0308	REF	17	LAST	1147	23,3187	11226 1		GRP2FC	

START 2ND PHASE OF INCRP2 TO TRANSFER
TEMP DEG TO PERM W MATRIX

DONE WITH W MATRIX. UPDATE STATE VECTOR

L MESSAGE SENT INCORPORATION

LSFR'S PAGE NO. 8 E5 S3

0309				23,3140	53375 0	VLCAD	VAR	START 3RD PHASE OF INCRP2
0310	REF	4	LAST	586	23,3141		X789	7TH,8TH,9TH,COMPONENT OF STATE VECTOR
0311	REF	8	LAST	1144	23,3142		DELTA X +120	INCORPORATION FOR X789
0312	REF	2	LAST	146	23,3143		TX789	
0313					23,3144		CTR	
0314	REF	12	LAST	586	23,3145		VEHUFFLG	
0315	REF	1			23,3146		DECSM	
0316	REF	1			23,3147		MOVEPLEM	
0317					23,3150	FAZAB	BCVR	AXT,2
0318	REF	2	LAST	565	23,3151		TCANZIG	
0319					23,3152		0	
0320					23,3152		77714 1	
0321	REF	1	LAST	717	23,3154		PCFF	AXT,2
0322					23,3155		MCENTHS	
0323					23,3156		+2	
0324					23,3157		2	
0325	REF	5	LAST	1146	23,3161		VLOAD	VSP#
0326					23,3161		DELTA X	B27 IF MOON ORBIT, B29 IF EARTH
0327					23,3162		-7,2	
0328	REF	4	LAST	322	23,3163		VAR	RDV
0329	REF	1			23,3164		DELTA V	
0330	REF	5	LAST	1146	23,3165		FAZAB1	
0331	REF	1	LAST	1148	23,3166		STCVL	DELTA V
0332					23,3167		DELTA X +6	E5 IF MOON ORBIT, B7 IF EARTH
0333					23,3170		VSP#	VAL
0334	REF	4	LAST	322	23,3171		-4,2	
0335					23,3172		TALV	
0336	REF	1			23,3173		RDV	
0337	REF	5	LAST	1148	23,3174		FAZAB2	
0338	REF	1			23,3175		STCALL	TMOV
0339					23,3176	FAZAB1	FAZAB2	
0340	REF	12	LAST	781	23,3177		VLCAD	VAL
0341	REF	11	LAST	1146	23,3200		RCV	
0342	REF	14	LAST	1149	23,3201		DELTA X	
0343					23,3202	FAZAB2	STORE	RCV
0344	REF	11	LAST	781	23,3203		VLOAD	VAR
0345	REF	12	LAST	1148	23,3204		VCV	
0346	REF	12	LAST	1148	23,3205		DELTA X +6	
0347					23,3206		STCRF	VCV
0348	REF	4	LAST	258	23,3207		SXA,2	CALL
0349	REF	1			23,3210		PRODY	
03491					23,3211	FAZAB3	RECTIFY	
03492	REF	18	LAST	1147	23,3212		CALL	GAP2PC
0350					23,3213		PRN	RTP
0351	REF	13	LAST	1148	23,3214		VEHUFFLG	
0352	REF	1			23,3215		DECSM1	
0353	REF	2	LAST	27	23,3216		MOVEPLEM	
0354					23,3217		CALL	
0355	REF	1			23,3220		SVCWN2	STORE DOWNLINK STATE VECTOR
0356					23,3221	FAZAB4	CALL	

L MEASUREMENT INTERPRETATION

LSEFF'S PAGE NO. 5 F5 S3

0357	REF	10	LAST	1148	23,2222	11226	1		GPP2PC	PHASE CHANGE
0358					23,2222	77214	0	REF	VLCAD	
0359	REF	7	LAST	1147	23,2224	22746	0		DMENFLG	
0360	REF	1			23,2224	47230	0		FA7AP5	6 DIMENSIONAL
0361	REF	3	LAST	1146	23,2224	3472	0		TX789	5 DIMENSIONAL
0362	REF	5	LAST	1146	23,2227	17	1	STORE	X789	
0363					23,2227	64150	0	FAZAB5	LXA,1	SXA,1
0364	REF	5	LAST	1145	23,2231	42772	1		FGROSS	
0365	REF	12	LAST	1092	23,2232	29752	0		GERET	
0366					23,2232	77776	1	EXIT		
0367	REF	55	LAST	862	23,2234	14635	0	TC	POSTJUMP	EXIT
0368	REF	2	LAST	114	23,2235	2742	1	CADR	INTWAKE	
0369					23,2236	52134	1	PCCSM	RTB	GETC
0370	REF	1			23,2237	26724	1		MOVFFCSM	
0371	REF	1			23,2240	47150	0		FAZAB	
0372					23,2241	45134	1	CCCSM1	RTB	CALL
0373	REF	1			23,2242	24675	1		MOVFFCSM	
0374	REF	1	LAST	248	23,2242	26114	1		SVDWA1	STORE ROWLINK STATE VECTOR
0375					23,2244	77650	1	GOTJ		
0376	REF	1			23,2245	47271	0		FA7AB4	
0377	REF	19	LAST	1144	23,2253			ZFRONT	=	ZEROVPCS
0378					23,2246	10166	1	54CC	DEC	54
0379					23,2247	77171	0	6CC	DEC	-6
0380					23,2250	10114	1	12CC	DEC	12
0400	REF	1			22,2711			SETLCC	RENDEZ	
0401								RANK		
0402	REF	1						COUNT*	14/INCR	
0412					22,2711	51575	1	NEWCOMP	VLCAD	ABVAL
0414	REF	17	LAST	1146	22,2712	12643	1			ZI
0415	REF	1			22,2713	2446	0	STCVL	NCFMZI	
0416	REF	18	LAST	1146	22,2714	12651	1			ZI +6
0417					22,2715	41446	1	ABVAL	PUSH	
0418					22,2715	51125	0	DSL	PMN	
0419	REF	2	LAST	1146	22,2717	01145	0		NCFMZI	
0411					22,2721	45723	0		+3	
0412	REF	3	LAST	1149	22,2721	45545	1	DLCAD	STADR	
0413					22,2722	77732	1	STORE	NCFMZI	
0414	REF	14	LAST	1145	22,2723	51575	1	VLCAD	ABVAL	
0415					22,2724	62657	1		ZI +120	
0416	REF	4	LAST	1146	22,2725	45216	1	PUSH	DSL	
0417					22,2727	01145	0		NCFMZI	
0418					22,2727	71240	1	PMN	DLCAD	
0419					22,2731	45133	1		+3	
0420	REF	5	LAST	1149	22,2731	77626	0	STADR		
0421					22,2732	77732	1	STORE	NCFMZI	LARGEST ABVAL
0422	REF	6	LAST	1146	22,2733	66145	1	DLCAD	SXA,1	
0423	REF	7	LAST	1146	22,2734	0045	0		NCFMZI	
0424					22,2735	01144	1		NCFMZI	SAVE x1
0425					22,2736	62111	0	NCM	INCR,1	

L MEASUREMENT INCORPORATION

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0425 REF 36 LAST 1143 22,3737 3737 1
 0426 22,3740 3740 2 C
 0427 22,3741 53775 1
 0428 REF 20 LAST 1145 22,3742 3743 1
 0429 22,3743 2021 1 C
 0430 REF 21 LAST 115 22,3744 26643 1
 0431 REF 22 LAST 1150 22,3745 32651 1
 0432 22,3746 77657 1
 0433 22,3747 20211 1
 0434 REF 23 LAST 1150 22,375 26651 1
 0435 REF 24 LAST 1150 22,3751 32657 1
 0436 22,3752 66157 1
 0437 22,3753 2121 1 C
 0438 REF 8 LAST 1149 22,3754 3745 1
 0439 REF 25 LAST 1150 22,3755 37657 1
 0440 22,3756 54159 1
 0441 REF 6 LAST 1147 22,3757 32133 1
 0442 REF 9 LAST 115 22,375 33345 C
 0443 22,3761 77660 1
 0444 REF 10 LAST 1150 22,3752 37345 1
 0445 22,3763 70130 1
 0446 REF 7 LAST 1150 22,3764 32103 1
 0447 REF 11 LAST 1150 22,3755 33345 1
 0448 22,3766 40270 1
 0449 REF 12 LAST 1150 22,3767 33344 1
 0450 22,377 33343 1
 0451 22,3771 77650 1
 0452 REF 2 LAST 1143 22,3772 46671 1
 0453 3744

X1
 CFC 2
 VLOAD VSL*
 ZI
 0,1
 STOVL ZI
 ZI +6
 VSL*
 0,1
 STOVL ZI +6
 ZI +120
 VSL* SXA,1
 0,1
 NORMZI +1
 STORE ZI +120
 LXA,1 XSL,1
 NORMGM
 NORMZI +1
 XSL,1
 NORMZI +1
 SXA,1 LXC,1
 NORMGM
 NORMZI +1
 XAD,1 SETPD
 NORMZI
 20
 COTO
 INCR2 -3
 360

SAVE SHIFT

NORMZI

=

L. GENIC SUBROUTINES

USER'S PAGE NO. 1 EQ 53

PG001 PROGRAM DESCRIPTION - GENIC SUBROUTINE LCG SECTION
PG003 MOD NO. - 0
PG005 WRN BY KRUS
PG007

DATE - 1 SEPTEMBER 1967
LCG SECTION - GENIC SUBROUTINES
ASSEMBLY - COLOSSUS REVISION 88

PG008 FUNCTIONAL DESCRIPTION -

PG009 THE FOLLOWING SET OF SUBROUTINES SOLVE VARIOUS PROBLEMS INVOLVING THE TRAJECTORY PRODUCED BY A CENTRAL
PG011 INVARS-SQUARED FORCE ACTION, ON A POINT MASS, AS OUTLINED IN THE CMC AND LCG LUNAR LANDING MISSION CSOP, SECTION
PG013 6.5.1.2. A GENERAL USER POINT-OF-VIEW WAS TAKEN IN FORMULATING, MECHANIZING, AND SCALING THE SUBROUTINES,
PG015 RATHER THAN OPTIMIZING EACH FOR A PARTICULAR USE. THEREFORE, MULTIPLE USAGE CAN BE MADE OF THE SUBROUTINES
PG017 INVOLVING ANY REALISTIC SET OF CONSTRAINTS. IT SHOULD BE NOTED THAT ONLY ONE SET OF CODING IS USED, WHETHER THE
PG019 LAMBDA, MUON, OR ANY OTHER CELESTIAL BODY IS SPECIFIED AS THE CENTRAL BODY OF THE PROBLEM, PROVIDED ONE OBSERVES
PG021 THE INHERENT SCALE CHANGE INVOLVED IN POSITION, VELOCITY, MU, AND TIME, AS OUTLINED IN MISSION PROGRAMMING
PG023 DEFINITION MEMO NO. 11. THIS CAN BE ACCOMPLISHED BY SIMPLY ADDING TO THE MULTABLE AND INITIALIZING THE SUBROUTINE
PG025 APPROPRIATELY.

PG026 DUE TO THE UNIFORMITY OF THE EQUATIONS INVOLVED, CODING WAS MINIMIZED BY TREATING INDIVIDUAL EQUATIONS AND
PG028 BLOCKS OF EQUATIONS AS SUBROUTINES OF LOWER RANK WHENEVER POSSIBLE. AS A RESULT, THREE BY-PRODUCTS SUBROUTINES,
PG030 DIRECTLY USABLE AS INDEPENDENT SUBROUTINES, WERE GENERATED.

PG031 RESTRICTIONS -

PG032 THE ONLY LIMITATION IN THE SCOPE OF PROBLEM WHICH CAN BE SOLVED BY A PARTICULAR SUBROUTINE IS THE SCALING
PG034 LIMIT OF EACH PARAMETER AS SPECIFIED IN THE GSCP. THESE SCALING LIMITS WERE CHOSEN SO THAT ALL FEASIBLE TRAJECTORIES
PG036 COULD BE HANDLED.

PG037 SINCE THE SUBROUTINES (EXCEPT KEPLER) USE COMMON SUBROUTINES OF LOWER RANK WHICH USE FEASIBLE OTHER THAN
PG039 THE PLSLIST (DUE TO ITS LIMITED SIZE) AND COMMON INTERPRETIVE SWITCHES, THE GENIC SUBROUTINES CANNOT BE ALLOWED
PG041 TO INTERRUPT EACH OTHER. IT IS UP TO THE USER TO GUARANTEE THIS CONDITION.
PG043

L CONIC SUBROUTINES

LSRPS PAGE NO. 2 EQ S3

R0044 PROGRAM DESCRIPTION - KEPLER SUBROUTINE

DATE - 11 OCTOBER 1967

R0046 MOD NO. - 1

LFG SECTION - CONIC SUBROUTINES

R0048 MOD BY X0048

ASSEMBLY - COLDSUS 103 AND SUNDANCE 222

R0050 MOD NO. - 2 (AUGUST 1968) BY ROBERTSON: TO PERMIT BACKDATING BY MORE THAN ONE ORBITAL PERIOD.

R0052 MOD NO. - 3 (DEC 1968) BY ROBERTSON: SUPPRESSION OF X-MODULUSING

R0054 MOD NO. - 4 (JAN 1969) BY ROBERTSON: CLEAR CWFINE AT KEPLER ENTRY

R0051 FUNCTIONAL DESCRIPTION -

R0052 THIS SUBROUTINE, GIVEN AN INITIAL STATE VECTOR AND THE DESIRED TRANSFER TIME THROUGH WHICH THE STATE IS TO BE UPDATED ALONG A CONIC TRAJECTORY, COMPUTES THE NEW, UPDATED STATE VECTOR. THE TRAJECTORY MAY BE ANY CONIC SECTION - CIRCULAR, ELLIPTIC, PARABOLIC, HYPERBOLIC, OR RECTILINEAR WITH RESPECT TO THE EARTH OR THE MOON. THE USE OF THE SUBROUTINE CAN BE EXTENDED USING OTHER PRIMARY BODIES BY SIMPLE ADDITIONS TO THE MULTABLE WITHOUT INTRODUCING ANY CODING CHANGES, ACCEPTING THE INHERENT SCALE FACTOR CHANGES IN POSITION AND VELOCITY. AN ITERATION TECHNIQUE IS UTILIZED IN THE COMPUTATION.

R0053 IF A NEGATIVE TIME-OF-FLIGHT IS INPUT, THE PROGRAM WILL SOLVE FOR THE STATE WHICH WOULD BE PRODUCED BY EXTRAPOLATING THE POSITION BACKWARD IN TIME.

R0054 IF THE ABSOLUTE VALUE OF THE DESIRED TRANSFER TIME EXCEEDS THE ORBITAL PERIOD, THE SUBROUTINE, THROUGH A MODULUS TECHNIQUE, WILL COMPUTE THE STATE CORRESPONDING TO THE DESIRED TIME (WHETHER POSITIVE OR NEGATIVE).

R0056

R0057 THE RESTRICTIONS ARE -

R0058 1. (PREVIOUS RESTRICTION ON THE NEGATIVE DESIRED TRANSFER TIME IS NOW DELETED.)

R0059 2. THE PARAMETERS IN THE PROBLEM CANNOT EXCEED THEIR SCALING LIMITS AS SPECIFIED IN THE GSCP. IF

R0060 ANY OF THESE LIMITS ARE EXCEEDED, THE RESULTING SOLUTION WILL BE MEANINGLESS.

R0062

R0063 THE NUMBER OF ITERATIONS AND, THEREFORE, THE COMPUTATION SPEED IS DEPENDENT ON THE ACCURACY OF THE

R0064

R0065

R0066

R0067

R0068

R0069

R0070

R0071

R0072

R0073

R0074

R0075

R0076

R0077

R0078

R0079

R0080

R0081

R0082

REFERENCES -

R0083 R-479, MISSION PROGRAMMING DEFINITION MEMO NO. 10, LUNAR LANDING MISSION GSCP, SECTION 5.5, SGA

R0084 LEMO 67-4.

R0085

R0086

R0087 INFL - REASABLE INITIALIZATION REQUIRED

R0088 * SCALE FACTOR *

R0089 VARIABLE IN POWERS OF 2 *

R0090 -----*-----

R0091 INFL * +29 FOR EARTH * INITIAL POSITION VECTOR IN METERS

R0092 * +27 FOR MOON *

DESCRIPTION AND REMARKS

L CONIC SUBROUTINES

LSEF'S PAGE NO. 3 EC 52

R0088 VECT * +7 FOR EARTH * INITIAL VELOCITY VECTOR IN METERS/CENTISECOND
 R0094 * +5 FOR MOON *
 R0095 XI (386)* NONE * IN X REGISTER SET TO -20 OR -100 ACCORDING TO WHETHER THE EARTH OR MOON,
 R0097 * * RESPECTIVELY, IS THE CENTRAL BODY
 R0098 T1. * +28 * TIED TRANSFER TIME IN CENTISECONDS (CP)
 R0099.7 * * MAY BE POS OR NEG AND ABSOLUTE VALUE MAY BE GREATER OR LESS THAN ONE ORBITAL PERIOD.
 R0099 XKIPAW * +17 FOR EARTH * GUESS OF ROOT X OF KEPLER'S EQN IN SQRT(METERS). SIGN SHOULD AGREE WITH THAT OF TAU.
 R0100 * +16 FOR MOON * AND ABS VALUE SHOULD BE LESS THAN THAT CORRESPONDING TO A PERIOD, VIZ, $2\pi \sqrt{a^3/\mu}$
 R0101 * * MAJOR AXIS, FOR SPEED OF CONVERGENCE, BUT IF EITHER CONDITION FAILS, XKERNW IS RESET
 R0102 * * BY KEPLER TO A PROB. BUT VALID GUESS.
 R0103 TC * +28 * PREV. VALUE OF TIME IN CENTISECS. MUST BE LESS THAN ONE ORBITAL PERIOD.
 R0104 XPREV * +17 FOR EARTH * PREV. VALUE OF X IN SQRT(METERS). MUST BE LESS THAN AN X CORRESPONDING TO ONE
 R0105 * +16 FOR MOON * ORBITAL PERIOD, VIZ, $2\pi \sqrt{a^3/\mu}$
 R0106

R0107 SUBROUTINES CALLED -
 R0108 ELTIME
 R0109

R0110 CALLING SEQUENCE AND NORMAL EXIT MODES -

R0111 KEPLER-2 GOTO MUST BE IN INTERPRETIVE MODE BUT COULD BE ARBITRARY.
 R0112 KEPLER-1 KEPLER RETURNS WITH XPREV IN MPAC. PL IS AT C.
 R0114 KEPLER-3 ... CONTINUE

R0115 KEPLER MUST NOT BE CALLED DIRECTLY SINCE AN INTERRUPTION OF IT WOULD DESTROY THE VARIABLES IT NEEDS TO COMPLETE
 R0116 THE INTERMEDIATE JOB. THE USER MUST CALL CSMCONIC OR LCMCONIC WHICH GUARANTEES NO INTERRUPTS AND WHICH
 R0118 ALSO CALLS KEPLER TO COMPLETE A GUESS OF XKERNW.
 R0120

R0121 ARGUMENT EXIT MODES -
 R0122 NONE
 R0123

R0124 OUTPUT -

VAR	* SCALE FACTOR *	DESCRIPTION AND REMARKS
R0125	* +29 FOR EARTH * TERMINAL POSITION VECTOR IN METERS	
R0126	* +27 FOR MOON *	
R0127	* +7 FOR EARTH * TERMINAL VELOCITY VECTOR IN METERS/CENTISEC	
R0128	* +6 FOR MOON *	
R0129	* +28 * TRANSFER TIME IN CENTISECS TO WHICH KEPLER CONVERGED. ALWAYS LESS THAN ONE PERIOD.	
R0130	* +17 FOR EARTH * VALUE OF X IN SQRT(METERS) TO WHICH KEPLER CONVERGED. ALWAYS LESS THAN THE X	
R0131	* +16 FOR MOON * CORRESPONDING TO ONE PERIOD.	

L CCAIC SUPPLIERS

LSEP'S PAGE NO. 4 EO 53

R0137 FOR OTHER OUTPUT WHICH MAY BE OF USE, SEE DEPRIS.
R0138

R0139 SHORTS -

R0140 PARAMETERS WHICH MAY BE OF USE -

R0141 * SCALE FACTOR *

R0142 VARIABLE*14 POWERS OF 2*

DESCRIPTION AND REMARKS

R0143 -----*

R0144 UNIT * +1 *SEE UNIT VECTOR OF INITIAL POSITION

R0145 P1 * +29 FOR EARTH*14 MAGNITUDE OF INITIAL POSITION IN METERS

R0146 * +27 FOR MOON *

R0147 ALPHA * -22 FOR EARTH* P INVERSE OF SEMI-MAJOR AXIS IN 1/METERS

R0148 * -20 FOR MOON *

R0149 INCLIN * +28 *SEE INTERNAL NUMBER OF PERIODS IN CENTISECS. WHICH WAS SUBTRACTED FROM 121. TO PRELCE A

R0140 * *TAU. OF LESS THAN ONE PERIOD.

R0149 PARAMETERS OF AC ICS -

R0150 OP PARAMETERS - EPSTCNT, I LK, DELT, RCFRMY, XMCULC, PLUS PUSHLIST REGISTERS C THROUGH 39D.

R0152

L CONIC SUPER CUT LINES

LSC'S PAGE NO. 5 P1 S3

R0153 PROGRAM DESCRIPTION - LUNAR SUPER CUT LINES
 R0154 MOD NO. - 3
 R0157 MOD BY KPAUS
 R0159

DATE - 1 SEPTEMBER 1967
 LOG SECTION - CONIC SUPER CUT LINES
 ASSEMBLY - COLUSSUS REVISION RP

R0160 FUNCTIONAL DESCRIPTION -

R0161 THIS SUPER CUT LINES CALCULATES THE INITIAL VELOCITY REQUIRED TO TRANSFER A POINT-MASS ALONG A CONIC TRAJECTORY
 R0162 FROM AN INITIAL POSITION TO A TERMINAL POSITION IN A PRESCRIBED TIME INTERVAL. THE RESULTING TRAJECTORY MAY BE
 R0163 A SECTION OF A CIRCLE, ELLIPSE, PARABOLA, OR HYPERBOLA WITH RESPECT TO THE EARTH OR THE MOON. THE USE OF THE
 R0164 SUPER CUT LINES CAN BE EXTENDED USING OTHER PRIMARY BODIES BY SIMPLE ADDITIONS TO THE MUTABLE WITHOUT INTRODUCING ANY
 R0165 COMPLEX CHANGES, ACCEPTING THE INHERENT SCALE FACTOR CHANGES IN POSITION AND VELOCITY. AN ITERATION TECHNIQUE IS
 R0166 UTILIZED IN THE COMPUTATION.
 R0167

R0172 THE RESTRICTIONS ARE -

R0174 1. RECTILINEAR TRAJECTORIES CANNOT BE COMPLETED.
 R0175 2. AN ACCURACY DEGRADATION OCCURS AS THE COSINE OF THE TRUE ANGLE DIFFERENCE APPROACHES +1.0.
 R0177 3. THE ANGLE BETWEEN ANY POSITION VECTOR AND ITS VELOCITY VECTOR MUST BE GREATER THAN 1 DEGREE 47.5 MINUTES
 R0178 AND LESS THAN 179 DEGREES 12.5 MINUTES.
 R0180 4. NEGATIVE TRANSFER TIME IS AMBIGUOUS AND WILL RESULT IN NO SOLUTION.
 R0182 5. THE PARAMETERS IN THE PROGRAM MUST NOT EXCEED THEIR SCALING LIMITS SPECIFIED IN THE GSCP. IF THE
 R0183 LIMITS ARE EXCEEDED, THE RESULTING SOLUTION WILL BE MEANINGLESS.
 R0185 THE NUMBER OF ITERATIONS AND, THEREFORE, THE COMPUTATION SPEED IS DEPENDENT ON THE ACCURACY OF THE FIRST
 R0187 GUESS OF THE INDEPENDENT VARIABLE, COCA. THE AGC COMPUTATION TIME IS APPROXIMATE-
 R0188 LY .105 SECONDS FOR INITIALIZATION, .065 SECONDS FOR FINAL COMPUTATIONS, PLUS .205 SECONDS FOR EACH ITERATION.
 R0190
 R0191

R0192 REFERENCES -

R0193 R-474, MISSION PROGRAMMING DEFINITION MEMO NO. 10, LUNAR LANDING MISSION GSCP-SECTION 5.5, SGA MEMO 67-8,
 R0194 SGA MEMO 67-4.
 R0196

R0197 INPUT - FEASIBLE INITIALIZATION REQUIRED

R0198 * SCALE FACTOR *

R0199 VARIABLE IN POWERS OF *

R0200 ----- *

R0201 RIVED * +29 FOR EARTH*P INITIAL POSITION VECTOR IN METERS

R0202 * +27 FOR MOON *

R0203 R2V1 * +29 FOR EARTH*P TARGET OR TERMINAL POSITION VECTOR IN METERS

R0204 * +27 FOR MOON *

R0205 TCEST1 * +29 * DESIRED TRANSFER TIME IN CENTISECONDS

R0206 X1 (RPP) * NONE * IN IX REGISTER SET TO -20 OR -100 ACCORDING TO WHETHER THE EARTH OR MOON,

R0207 * * RESPECTIVELY, IS THE CENTRAL BODY

R0208 DECSW * NONE * SET +.5 IF DESIRED TRANSFER ANGLE IS LESS THAN 180 DEGREES, -.5 IF GREATER THAN 180 DEG.

R0209 COCSSW * NONE * CAN INTERPRET SWITCH TO BE SET IF NO GUESS OF COCA IS AVAILABLE, CLEAR IF A GUESS OF

DESCRIPTION AND REMARKS

1 CALLIO SUBROUTINES

USER'S PAGE NO. 6 EQ 53

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R0212      *          *COGA IS TO BE USED BY LAMBERT
R0214      COGA      * +5      *COSSESS OF COTANGENT OF FLIGHT PATH ANGLE (MEASURED FROM VERTICAL). THIS WILL BE
R0216      *          *IGNORED IF GUESSW IS SET.
R0217      NORMSW    * 1000    *AN INTERPRETER SWITCH TO BE SET IF UN IS TO BE AN INPUT TO THE SUBROUTINE, CLEAR IF
R0219      *          *LUMBERT IS TO COMPUTE ITS OWN NORMAL (UN).
R0220      UN        * +1      *COS UNIT NORMAL TO THE DESIRED ORBIT PLANE IN THE DIRECTION OF THE RESULTING ANGULAR
R0222      *          *MOMENTUM VECTOR. THIS WILL BE IGNORED IF NORMSW IS CLEAR.
R0224      VTARGET* VONE      *A P.P. TAG TO BE SET TO ZERO IF LAMBERT IS TO COMPUTE THE VELOCITY AT R2VEC AS WELL AS
R0226      *          *AT R1VEC.
R0227      ITERCT* 1000      *A P.P. COUNTER WHICH SPECIFIES THE MAXIMUM NUMBER OF ITERATIONS ALLOWABLE.
R02271     *          *THIS ITERATION MEANS A PASS THRU KEPLER EQN (DELTIME). AT LEAST ONE OF THESE MUST
R02272     *          *ALWAYS OCCUR, EVEN IF COGA CORRESPONDING TO SOLUTION WERE INPUT AS A GUESS.)
R02273     *          *ATMANY ITERATIONS ARE SUFFICIENT TO SOLVE ALL PROBLEMS INCLUDING THOSE WITHOUT GUESS.
R02274

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R0226      SUBROUTINES CALLED -
R0229      CFCM, CPTX, ISLTH, ITERATOR, LAMENTER (PART OF NEWSTAT)
R0230

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R0231 CALLING SEQUENCE AND NORMAL EXIT MODES -

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R0232      1          CALL          MUST BE IN INTERPRETIVE MODE BUT OVFIND ARBITRARY.
R0234      L+1          LAMBERT      RETURNS WITH FL AT 0 AND WITH VVEC IN MPAC IF VTARGET WAS NON-ZERO OR VTARGET
R0236      *          *IN MPAC IF VTARGET WAS ZERO.
R0237      L+2          PCN          CONTINUE IF SOLNSW CLEAR SINCE SOLUTION IS ACCEPTABLE
R0239      L+3          SOLNSW
R0240      L+4          LAMBERT
R0241      IF A LAMBERT RESULT IS TO BE A FIRST GUESS FOR THE NEXT LAMBERT CALCULATION, COGA MUST BE PRESERVED AND
R0243      GUESSW MUST BE CLEAR FOR EACH SUCCEEDING LAMBERT CALL.
R0244

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R0245 ABORT EXIT MODES -

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R0246      1          SOLNSW WAS SET UP ON EXITING, EITHER LAMBERT WAS ASKED TO COMPUTE A TRANSFER TOO NEAR 0 OR 360 DEG, OR IT
R0248      WAS TOO SMALL TO PRODUCE A REALISTIC TRANSFER BETWEEN P1VEC AND R2VEC. IN EITHER CASE THE FIX MUST BE MADE
R0250      ACCORDING TO THE NEEDS OF THE PARTICULAR USER. THE ABORT EXIT MODE MAY BE CODED AS ...
R0252      LAMBERT CLEAR      *S      A MEASURE OF PROXIMITY TO 0 OR
R0253      *          *1-ESTH      360 DEGREES.
R0254      *          *PSU      RMN
R0255      *          *CERRIT
R0256      *          *CHANCE12      CHANGE R2VEC DIRECTION SLIGHTLY.
R0257      *          *CLDAD      FAC
R0258      *          *TIESIEP
R0259      *          *SCMETIME
R0260      *          *STCALL TOESIED      INCREASE TOESIED
R0261      *          *LAMBERT
R0262

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L CONIC SUBROUTINES

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R0263 CUIPLT -
 R0264 * SCALE FACTOR *
 R0265 VARIABLE*IN POWERS OF 2* DESCRIPTION AND REMARKS
 R0266 -----*-----*
 R0267 VVEC * +7 FOR EARTH *DP INITIAL VELOCITY VECTOR IN METERS/CENTISECOND REQUIRED TO SATISFY THE BOUNDARY VALUE
 R0268 * +5 FOR MOON *PROBLEM.
 R0270 VTARGET * +7 FOR EARTH *DP RESULTANT VELOCITY VECTOR AT R2VEC IN METERS/CENTISECOND.
 R0272 * +5 FOR MOON *
 R0273 SCONSW * NONE *INTERPRETER SWITCH WHICH IS SET IF THE SUBROUTINE CANNOT SOLVE THE PROBLEM, CLEAR IF THE
 R0275 * *SOLUTION EXISTS.
 R0276 FOR OTHER OUTPUT WHICH MAY BE OF USE, SEE DEBRIS.
 R0277

R0278 DEBRIS -
 R0279 PARAMETERS WHICH MAY BE OF USE -

R0280 * SCALE FACTOR *
 R0281 VARIABLE*IN POWERS OF 2* DESCRIPTION AND REMARKS
 R0282 -----*-----*
 R0283 SINT * +1 *DP SIN OF ANGLE BETWEEN R1VEC AND R2VEC
 R0284 CSTH * +1 *DP COSINE OF ANGLE
 R0285 1-CSTH * +2 *DP 1-CSTH
 R0286 COCA * +5 *DP CO-TAN OF INITIAL REQUIRED FLIGHT PATH ANGLE MEASURED FROM VERTICAL
 R0289 P * +4 *DP RATIO OF SEMILATUS RECTUM TO INITIAL RADIUS
 R0290 R1A * +6 *DP RATIO OF INITIAL RADIUS TO SEMIMAJOR AXIS
 R0291 R1 (320) * +29 FOR EARTH*DP INITIAL RADIUS IN METERS
 R0292 * +27 FOR MOON *
 R0293 URI * +1 *DP UNIT VECTOR OF R1VEC
 R0294 U2 * +1 *DP UNIT VECTOR OF R2VEC

R0295 PARAMETERS OF NO USE
 R0296 DP PARAMETERS - EPSILON, CSTH-RHO, TPREV, TERLAMB, R2, RTNLAMB (SF), PLUS PUSHLIST REGISTER 0 THROUGH 410
 R0298 ADDITIONAL INTERPRETIVE SWITCHES USED - INFINFLG, 360SW, SLOPESW, OPDRSW
 R0300

1 CONIC SUBROUTINES

LSCF'S PAGE NO. 8 PD 53

PG361 PROGRAM DESCRIPTION - TIM -THETA SUBROUTINE
 PG363 MFC NO. - 1
 PG365 MFC BY KRAUSE
 PG367

DATE - 1 SEPTEMBER 1967
 LCC SECTION - CONIC SUBROUTINES
 ASSEMBLY - CCESSUS REVISION 88

R0369 FLATLINE DESCRIPTION -

R0369 THIS SUBROUTINE, GIVEN AN INITIAL STATE VECTOR AND A DESIRED TRUE-ANOMALY-DIFFERENCE THROUGH WHICH THE
 R0371 STATE IS TO BE UPDATED, CALCULATES THE CORRESPONDING TIME-OF-FLIGHT AND, IN ADDITION,
 PG373 PROVIDES THE OPTION OF COMPUTING THE NEW UPDATED STATE VECTOR. THE RESULTING TRAJECTORY MAY BE A SECTION OF A
 R0375 CIRCLE, ELLIPSE, PARABOLA, OR HYPERBOLA WITH RESPECT TO THE EARTH OR THE MOON. THE USE OF THE SUBROUTINE CAN BE
 R0377 EXTENDED USING OTHER PRIMARY BODIES BY SIMPLE ADDITIONS TO THE TABLE WITHOUT INTRODUCING ANY CODING CHANGES,
 R0379 ACCEPTING THE INHERENT SCALE FACTOR CHANGES IN POSITION AND VELOCITY.
 R0381

R0381 THE RESTRICTIONS ARE -

R0382 1. THE ANGLE BETWEEN ANY POSITION VECTOR AND ITS VELOCITY VECTOR MUST BE GREATER THAN 1 DEGREE 47.5 MINUTES
 R0384 AND LESS THAN 178 DEGREES 12.5 MINUTES.
 R0386 2. THE PARAMETERS IN THE PROBLEM MUST NOT EXCEED THEIR SCALING LIMITS SPECIFIED IN THE GSCF. IF THE LIMITS
 R0388 ARE EXCEEDED, THE RESULTING SOLUTION WILL BE MEANINGLESS.

R0389 THE GSC COMPLETION TIME IS APPROXIMATELY .252 SECONDS.
 R0391

R0391 REFERENCES -

R0393 -474, MISSION PRELIMINARY INITIATION MEMO NO. 10, LUNAR LANDING MISSION GSCF-SECTION 5.5, SCA MEMO #7-8.
 R0395

R0395 INPUT - FEASIBLE INITIALIZATION REQUIRED

VAR	SCALE FACTOR	DESCRIPTION AND REMARKS
R0396	* +29 FOR EARTH	INITIAL POSITION VECTOR IN METERS
R0397	* +27 FOR MOON	
R0398	* +7 FOR EARTH	INITIAL VELOCITY VECTOR IN METERS/CENTISECOND
R0399	* +5 FOR MOON	
R0400	* +1	OP SIGN OF TRUE-ANOMALY-DIFFERENCE THROUGH WHICH THE STATE IS TO BE UPDATED
R0401	* +1	THE COSINE OF THE ANGLE
R0402	* +1	AN INTERPRETIVE SWITCH TO BE SET IF ONLY TIME IS TO BE AN OUTPUT, CLEAR IF THE NEW STATE
R0403	* +1	TO BE COMPLETED ALSO.
R0404	* +1	INDEX REGISTER TO BE SET TO -20 OR -100 ACCORDING TO WHETHER THE EARTH OR MOON,
R0405	* +1	RESPECTIVELY, IS THE CENTRAL BODY.

R0405 SUBROUTINE CALLS -

L GENIC PLUM UTILITIES

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R0353 FALAN, COM, CCTX, PLATHE, NEWSTATE
 R0354

R0355 CALLING SEQUENCE AND MODEL EXIT MODES -

R0356 IF ONLY TIME IS DESIRED AS OUTPUT -

R0357 1 SET CALL MUST BE IN INTERPRETIVE MODE BUT DEFINING ARBITRARY.
 R0358 1+1 PVSX
 R0359 1+2 TIMETHET RETURN WITH PL AT 1 AND 1 IN MPAC
 R0360 1+3 ... CONTINUE
 R0361

R0362 IF THE UPDATE STATE VECTOR IS DESIRED AS WELL -

R0363 1 CLEAR CALL MUST BE IN INTERPRETIVE MODE BUT DEFINING ARBITRARY.
 R0364 1+1 PVSX
 R0365 1+2 TIMETHET RETURNS WITH PL AT 1. THE INITIAL POSITION VECTOR IS IN 3D OF THE PLS-LIST AND
 R0366 THE INITIAL VELOCITY VECTOR IN MPAC.
 R0367 1+3 STOVL NEWVVE
 R0368 1+4 STADD
 R0369 1+5 STORP NEWVVE
 R0370 1+6 ... NEWVVE AND NEWVVE ARE SYMBOLIC REPRESENTATIONS OF THE USER'S LOCATIONS.
 R0371 CONTINUE
 R0372
 R0373

R0374 ALERT EXIT MODES -

R0375 IF COMAFAC AND/OR INFINEL IS SET AT THE EXIT TO TIME-THETA, TIME-THETA WILL TRANSFER TO P0000 WITH
 R0376 AN ALERT CODE (ORIGINALLY 10627), AND NOT RETURN TO THE CALLING PROGRAM. (FOR 692 AND 721).
 R0377

R0378 OUTPUT -

DESCRIPTION AND REMARKS
R0379 * SCALE FACTOR *
R0380 VARIATION IN POWERS OF 2 *
R0381 T (3 D) * +21 THE TRANSFER TIME IN CENTISECONDS
R0382 INFINEL * N/A * AN INTERPRETIVE SWITCH WHICH IS SET IF THE TRANSFER ANGLE REQUIRES CLOSURE THROUGH
R0383 * * MINUTELY (NO SOLUTION), CLEAR IF A PHYSICAL SOLUTION IS POSSIBLE.
R0384 COMAFAC * N/A * AN INTERPRETIVE SWITCH WHICH IS SET IF RESTRICTION 1 HAS BEEN VIOLATED (NO SOLUTION),
R0385 * * ALL AD IF NOT.

R0386 IN ADDITION, IF PVSX IS CLEAR, THE FOLLOWING ARE OUTPUT-

R0387 VVEAL - * +7 FOR EARTH * TERMINAL VELOCITY VECTOR IN METERS/CENTISEC.
 R0388 MPAC +* +5 FOR MOON *
 R0389 PL - * +20 FOR EARTH * TERMINAL POSITION VECTOR IN METERS (PL AT 10)
 R0390 * +22 FOR MOON *

R0391 FOR OTHER OUTPUT WHICH MAY BE OF USE, SEE COMMENTS.
 R0392

L CHITIC CUMULATIVE

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R0406 DEEDIS -

R0407 PARAMETERS WHICH MAY BE OF USE -

PARAMETER	UNIT	DESCRIPTION AND REMARKS
R0408	* SCALE FACTOR *	
R0409	VARIALE IN DEEDIS OF 2*	
R0410	-----*-----*	-----*-----*
R0411	R1 (320)*	*24 FOR EARTHED MAGNITUDE OF INITIAL POSITION VECTOR, RVFC, IN METERS
R0412	* +27 FOR MOON *	
R0413	* +1 *	*RATIO OF R1 TO SEMIMAJOR AXIS (NEG. FOR HYPERBOLIC TRAJECTORIES)
R0414	* +4 *	*RATIO OF SEMIMAJOR AXIS TO R1
R0415	* +5 *	*RATIO OF SEMIMAJOR AXIS TO R1
R0416	* +1 *	*RATIO OF SEMIMAJOR AXIS TO R1
R0417	* +1 *	*RATIO OF SEMIMAJOR AXIS TO R1
R0418	* +1 *	*RATIO OF SEMIMAJOR AXIS TO R1
R0419	* +1 *	*RATIO OF SEMIMAJOR AXIS TO R1
R0420	* +1 *	*RATIO OF SEMIMAJOR AXIS TO R1
R0421	* +1 *	*RATIO OF SEMIMAJOR AXIS TO R1
R0422	* +1 *	*RATIO OF SEMIMAJOR AXIS TO R1

R0423 PARAMETERS OF NO USE -

R0424 SP PARAMETERS - RTATT, COMBSON, STAFFM, MAGVEC2=R2 (OF), PLUS PUSHLIST LOCATIONS C-110, 140-210, 240-350, 410

R0425 ADDITIONAL INTERPRETIVE SWITCHES USED - ACMSW, 26 SW

R0426

L CONIC SUBROUTINE

USER'S PAGE NO. 11 E7 S3

R0438 PROGRAM DESCRIPTION - CONIC-MAIUS SUBROUTINE
 R0439 AIT NO. -1
 R0432 WRITTEN BY KRAJSE
 R0434

DATE - 11 OCTOBER 1967
 LCC SECTION - CONIC SUBROUTINES
 ASSEMBLY - COLOSSUS REVISION 88

R0435 FUNCTIONAL DESCRIPTION -

R0436 THIS SUBROUTINE, GIVEN AN INITIAL STATE VECTOR AND A DESIRED RADII TO WHICH THE
 R0437 STATE IS TO BE RELATED, CALCULATES THE CORRESPONDING TIME-OF-FLIGHT AND, IN ADDITION,
 R0438 PROVIDES THE OPTION OF COMPUTING THE NEW UPDATED STATE VECTOR. THE RESULTING TRAJECTORY MAY BE A SECTION OF A
 R0439 CIRCLE, ELLIPSE, PARABOLA, OR HYPERBOLA WITH RESPECT TO THE EARTH OR THE MOON. THE USE OF THE SUBROUTINE CAN BE
 R0440 EXTENDED USING OTHER ORBITAL POSITIONS BY SIMPLE ADDITIONS TO THE MUTABLES WITHOUT INTRODUCING ANY CODING CHANGES,
 R0441 ACCEPTING THE INHERENT SCALE FACTOR CHANGES IN POSITION AND VELOCITY.
 R0442 IF THE DESIRED RADII IS BEYOND THE RADIUS OF APCENTER OF THE CONIC OR BELOW THE RADII OF PERICENTER,
 R0443 APPROX WILL BE SET AND THE SUBROUTINE WILL RETURN THE APCENTER OR PERICENTER SOLUTION, RESPECTIVELY.
 R0444

R0450 THE RESTRICTIONS ARE -

R0451 1. THE ANGLE BETWEEN ANY POSITION VECTOR AND ITS VELOCITY VECTOR MUST BE GREATER THAN 1 DEGREE 47.5 MINUTES
 R0452 AND LESS THAN 178 DEGREES 12.5 MINUTES.
 R0453 2. THE PARAMETERS IN THE PROBLEM MUST NOT EXCEED THEIR SCALING LIMITS SPECIFIED IN THE CSOR. IF THE LIMITS
 R0454 ARE EXCEEDED, THE RESULTING SOLUTION WILL BE MEANINGLESS.
 R0455 3. AN ACCURACY DEGRADATION OCCURS AS THE SENSITIVITIES OF TIME AND UPDATED STATE VECTOR TO CHANGES IN
 R0456 DESIRED INCREASE. THIS WILL OCCUR NEAR EITHER APSES OF THE CONIC AND WHEN THE CONIC IS NEARLY CIRCULAR. IN
 R0457 PARTICULAR, IF THE CONIC IS AN EXACT CIRCLE, THE PROBLEM IS UNDEFINED AND THE SUBROUTINE WILL ABORT.
 R0458

R0459 THE AGC COMPUTATION TIME IS APPROXIMATELY .363 SECONDS

R0460

R0461 REFERENCES -

R0462 44-479, MISSION REQUIREMENTS DEFINITIVE MEMO NO. 1, LUNAR LANDING MISSION CSOR-SECTION 5.5, SCA MEMO 67-8.
 R0463

R0465 INPUT - ENHANCED INITIALIZATION REQUIRED

R0466 * SCALE FACTOR *

R0467 VARIABLE IN POWERS OF 2*

R0468 -----*

R0469 FV * +29 FOR EARTH OR INITIAL POSITION VECTOR IN METERS

R0470 * +27 FOR MOON *

R0471 VVE * +7 FOR EARTH * INITIAL VELOCITY VECTOR IN METERS/SECOND

R0472 * +5 FOR MOON *

R0473 DIST * +29 FOR EARTH * TERMINAL RADIAL DISTANCE ON CONIC TRAJECTORY FOR WHICH TRANSFER TIME IS TO BE

R0474 * +27 FOR MOON *

R0475 SEARCH * APT
 R0476 * TAG SET TO +.5 OR -.5 ACCORDING TO WHETHER THE RADIAL VELOCITY AT DESIRED IS TO BE
 R0477 * POSITIVE OR NEGATIVE, RESPECTIVELY. THIS TAG REFUSES THE DOUBLE-VALUED PROBLEM TO A

L CONIC SUBROUTINE

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R0481 * * * * *
 R0481 XI (241)*NONE * * * * *
 R0483 * * * * *
 R0484 PVSX * NONE * * * * *
 R0486 * * * * *
 R0487 * * * * *

R0488 SUPP UTINES CALLED -
 R0489 PARAN, QTCM, GETX, SETTIME, NEWSTATE
 R0490

R0491 CALLING SEQUENCE AND NORMAL EXIT MODES -

R0492 IF ONLY TIME IS DESIRED AS OUTPUT -
 R0493 L S T CALL MUST BE IN INTERPRETIVE MODE BUT CVFINC ARBITRARY.
 R0495 L+1 PVSX
 R0496 L+2 TIMERC RETURN WITH PL AT 3 AND T IN MPAC
 R0497 L+3 ... CONTINUE
 R0498

R0499 IF THE UPDATE STATE VECTOR IS DESIRED AS WELL -

R0500 L CLEAR CALL MUST BE IN INTERPRETIVE MODE PLT CVFINC ARBITRARY.
 R0502 L+1 PVSX
 R0503 L+2 TIMERC RETURNS WITH PL AT 6. THE INITIAL POSITION VECTOR IS IN CD OF THE PUSHLIST AND
 R0504 THE INITIAL VELOCITY VECTOR IN MPAC.
 R0506 L+3 STCVL NEWVVE
 R0507 L+4 STADL
 R0509 L+5 STCVL NEWRVLL NIWVVEC AND NEWRVVEC ARE CYMEOLIC REPRESENTATIONS OF THE USERS LOCATIONS.
 R0510 L+6 ... CONTINUE
 R0511

R0512 APOST EXIT MODES -

R0513 IF SOLUSW AND/OR COGAFIAG AND/OR INFINLC IS SET AT THE EXIT TO TIME-RADIUS, TIME-RADIUS WILL TRANSFER
 R0514 TO PC000 WITH AN ALARM CODE (ORIGINALLY 0607), AND NOT RETURN TO THE CALLING PROGRAM. (PCP 692 & 721)
 R0522

R0523 OUTPUT -

R0524 * SCALE FACTOR *

R0525 VARIABLE IN POWERS OF 2*

R0526 -----*

DESCRIPTION AND REMARKS

R0527 T (300) * +28 * OF TRANSFER TIME IN CENTISECONDS

R0528 INFINLC * NONE

R0530 * * * * *

R0532 COGAFIAG * NONE * * * * *

R0534 * * * * *

R0535 APOSTW * NONE * * * * *

L C AIO SOLUTIONS

USER'S PAGE NO. 13 FC 53

R0547 * * * * *
 R0548 * * * * *
 R0549 * * * * *
 R0541 * * * * *
 R05411 * * * * *
 R05413 * * * * *
 R05415 * * * * *
 R0542 * * * * *

R0543 IN ADDITION, IF RVSW IS EQUAL, THE FOLLOWING ARE OUTPUT-

R0544 * * * * *
 R0545 * * * * *
 R0546 * * * * *
 R0547 * * * * *

R0548 * * * * *
 R0549 * * * * *

R0550 * * * * *

R0551 * * * * *

PARAMETER	DESCRIPTION AND REMARKS
R0552 * * * * *	* * * * *
R0553 * * * * *	* * * * *
R0554 * * * * *	* * * * *
R0555 * * * * *	* * * * *
R0556 * * * * *	* * * * *
R0557 * * * * *	* * * * *
R0558 * * * * *	* * * * *
R0559 * * * * *	* * * * *
R0560 * * * * *	* * * * *
R0561 * * * * *	* * * * *
R0562 * * * * *	* * * * *
R0563 * * * * *	* * * * *
R0564 * * * * *	* * * * *
R0565 * * * * *	* * * * *
R0566 * * * * *	* * * * *
R0567 * * * * *	* * * * *
R0568 * * * * *	* * * * *
R0569 * * * * *	* * * * *

R0570 * * * * *

R0571 * * * * *
 R0572 * * * * *
 R0573 * * * * *
 R0574 * * * * *

L CONIC SUBROUTINES

USER'S PAGE NO. 14 FC 53

R0575 PROGRAM DESCRIPTION - APSIDES SUBROUTINE
 R0577 MOD NO. - 1
 R0579 MOD BY KRAUSE
 R0581

DATE - 1 SEPTEMBER 1967
 LOG SECTION - CONIC SUBROUTINES
 ASSEMBLY - COLLOSSUS REVISION 88

R0582 FUNCTIONAL DESCRIPTION -

R0583 THIS SUBROUTINE, GIVEN AN INITIAL STATE VECTOR CALCULATES THE RADIUS OF PERICENTER AND OF APCCENTER AND THE
 R0585 ECCENTRICITY OF THE RESULTING CONIC TRAJECTORY, WHICH MAY BE A STRAIGHT LINE,
 R0587 CIRCLE, ELLIPSE, PARABOLA, OR HYPERBOLA WITH RESPECT TO THE EARTH OR THE MOON. THE USE OF THE SUBROUTINE CAN BE
 R0589 EXTENDED USING OTHER PRIMARY BODIES BY SIMPLE ADDITIONS TO THE MUTABLE WITHOUT INTRODUCING ANY CODING CHANGES,
 R0591 ACCEPTING THE INHERENT SCALE FACTOR CHANGES IN POSITION AND VELOCITY.
 R0592

R0593 THE RESTRICTIONS ARE -

R0594 1. IF APCCENTER IS BEYOND THE SCALING OF POSITION, THE SCALE FACTOR LIMIT (536,670,910 METERS WITH RESPECT
 R0596 TO THE EARTH OR 134,217,727.5 METERS WITH RESPECT TO THE MOON) WILL BE RETURNED.
 R0598 2. THE PARAMETERS IN THE PROBLEM MUST NOT EXCEED THEIR SCALING LIMITS SPECIFIED IN THE GSCF. IF THE LIMITS
 R0600 ARE EXCEEDED, THE RESULTING SOLUTION WILL BE MEANINGLESS.

R0601 THE AGC COMPUTATION TIME IS APPROXIMATELY .163 SECONDS.
 R0602

R0603 REFERENCES -

R0604 MISSION PROGRAMMING DEFINITION MEMO NO. 10, LUNAR LANDING MISSION GSCF-SECTION 5.5
 R0606

R0607 INPUT - FRASABLE INITIALIZATION REQUIRED

R0608 * SCALE FACTOR *

R0609 VARIABLE*IN PCWPS OF 2*

DESCRIPTION AND REMARKS

R0610 -----*-----*

R0611 RVEC * +29 FOR EARTH*CP INITIAL POSITION VECTOR IN METERS

R0612 * +27 FOR MOON *

R0613 VVEC * +7 FOR EARTH *CP INITIAL VELOCITY VECTOR IN METERS/CENTISECOND

R0614 * +5 FOR MOON *

R0615 X1 (38C)*NONE *INDEX REGISTER TO BE SET TO -20 OR -100 ACCORDING TO WHETHER THE EARTH OR MOON,

R0617 * *RESPECTIVELY, IS THE CENTRAL BODY.

R0618

R0619 SUBROUTINES CALLED -

R0620 PARM, GFCM

R0621

R0622 CALLING SEQUENCE AND NORMAL EXIT MODES -

L CONT. SITUATIONS

USER'S PAGE NO. 15 FD S3

R0622 IF ONLY TIME IS DESIRED, SET CITEUT -

R0624 L CALL MUST BE IN INTERPRETIVE MODE BUT CAVING ARBITRARY.

R0626 L+1 RETURNS WITH PL AT 0, RADIUS OF APPOCENTER IN MPAC AND RADIUS OF PERICENTER IN CC

R0628 L+2 ST CL *PERIC

R0630 L+3 *C

R0632 L+4 STOR *PERIAP *APCARS AND PERIAPSE ARE SYMBOLIC REPRESENTATIONS OF THE USER'S LOCATIONS

R0634 L+5 ... CONTINUE

R0636

R0624 OUTPUT -

R0630 * SCALE FACTOR

R0636 VARIABLE * IN POWERS OF 24 DESCRIPTION AND REMARKS

R0638 -----*-----

R0638 MPAC * +29 FOR EARTH * RADIUS OF APPOCENTER IN METERS

R0638 * +27 FOR MOON

R0640 * +25 FOR EARTH * RADIUS OF PERICENTER IN METERS

R0641 * +27 FOR MOON

R0642 ECC * +2 * E * ECCENTRICITY OF CONIC TRAJECTORY.

R0644 FOR OTHER OUTPUT WHICH MAY BE OF USE, SEE FEBPIS.

R0644

R0645 CFF IS -

R0646 PARAMETERS WHICH MAY BE OF USE -

R0647 * SCALE FACTOR

R0649 VARIABLE * IN POWERS OF 24

R0649 -----*----- DESCRIPTION AND REMARKS

R0651 R1 (R21) * +25 FOR EARTH * MAGNITUDE OF INITIAL POSITION VECTOR, RVEC, IN METERS

R0652 * +27 FOR MOON *

R0653 S1A * +1 * OF RATIO OF R1 TO SEMI-MAJOR AXIS (NEG. FOR HYPERBOLIC TRAJECTORIES)

R0655 P * +4 * OF RATIO OF SEMI-LATUS RECTUM TO R1

R0656 CFCF * +5 * OF CO-TAN OF ANGLE BETWEEN VEC AND VVEC

R0658 U1 * +1 * OF UNIT VECTOR OF RVEC

R0659 U2 * +1 * OF UNIT VECTOR OF VVEC

R0660 U3 * +1 * OF UNIT VECTOR OF U1xU2

R0661 MACVVEC2 * +7 FOR EARTH * P MAGNITUDE OF VVEC

R0662 * +5 FOR MOON *

R0663

R0664 PARAMETERS OF AGC USE -

R0665 SP PARAMETERS - RTNAP, CLIMSON, TYPK, PLUS PUSHLIST LOCATIONS (-5, 100-110, 140-210, 310-380.

R0667 ADDITIONAL INTERPRETIVE SWITCHES USED - AGCNSW

R0668

L CONIC SUBROUTINES

USER'S PAGE NO. 16 FC S3

067				12,2 72		BANK		
0671	REF	1				CONUT*	*1/CONIC	
0672	REF	2	LAST	176	54,170	FRANK=	UP1	
0678					12,2 22	41	1	1 KEPLERN
0679					12,2 24	00	0	1
0680					12,2 26	24	02	0
0681					12,2 26	77	73	1
0683	REF	4	LAST	693	12,2 27	1	2	5 9
0684					12,2 28	24	17	1
0685	REF	4	LAST	710	12,2 31	01	50	0
0686					12,2 32	66	25	0
0687	REF	2	LAST	698	12,2 33	01	27	1
0688					12,2 34	01	24	1
0689	REF	2	LAST	126	12,2 35	16	47	0
0690					12,2 36	01	45	0
0691	REF	4	LAST	690	12,2 37	24	14	1
0692	REF	5	LAST	1166	12,2 38	01	50	0
0693					12,2 39	76	44	1
0694	REF	3	LAST	457	12,2 40	01	51	0
0695					12,2 42	76	40	1
0696	REF	1			12,2 44	01	12	0
0697	REF	1			12,2 45	24	14	0
0698	REF	4	LAST	1166	12,2 46	01	51	0
0699					12,2 47	57	23	1
0700	REF	1			12,2 50	00	17	1
0701					12,2 51	52	40	1
0702	REF	6	LAST	1166	12,2 52	00	34	1
0703					12,2 53	61	42	0
0704	REF	1			12,2 54	11	17	1
0705	REF	1			12,2 55	50	04	0
0706					12,2 56	74	42	0
0707	REF	2	LAST	1166	12,2 57	11	17	1
0708					12,2 58	77	67	1
0709	REF	7	LAST	1166	12,2 59	00	34	1
0710	REF	1			12,2 62	00	11	1
0711					12,2 63	71	24	0
0712	REF	1			12,2 64	24	73	1
0713	REF	1			12,2 65	11	35	1
0714					12,2 66	40	77	0
0715	REF	2	LAST	1166	12,2 67	00	11	1
0716	REF	1			12,2 70	24	77	1
0717					12,2 71	52	16	1
0718	REF	2	LAST	1166	12,2 72	24	77	1
0719					12,2 73	55	26	1
0720								1 FLV
0721								SQRT
0722								RODV
0723								
0724								
0725								
0726								
0727								
0728								
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0798								
0799								
0800								

1/RODTMU (-17 OR -14)
C1=RV/RODTMU (+17 OR +16)

1/MU (-24 OR -28)

C2=RV/V/MU -1 (+6)

ALPHA=(1-C2)/R1 (-22 OR -20)

MAXIMUM X DEPENDS ON TYPE OF CONIC

-50SC (+12)

SQRT RODV

L COMIC SOLUTIONS

LSEPAGE NO. 17 F5 S3

0720	REF	1		12,2174	11737 0		2FISC	2FISC (+6)
0721	REF			12,2175	7760 1	TRV		
0722	REF	3	LAST 1167	12,2176	24177 1		STJREMAX	
0723	REF	1		12,2177	12112 1	STJREMAX	STORE	XMAX
0724	REF			12,2178	6523 0	OMP		RDDL
0725	REF	2	LAST 1166	12,2179	11023 1		1/FCCCTML	
0726	REF	2	LAST 1166	12,2180	12111 1		ALPHA	
0727	REF			12,2183	65201 1	NDPM		RDDL
0728	REF	27	LAST 1155	12,2184	71147 1			X1
0729	REF			12,2185	56257 1	SI *	QDV	
0730	REF			12,2186	21173 1			0 -6,1
0731	REF			12,2187	57700 1	BCV	RMK	
0732	REF	1		12,2188	24124 0		MCDDCNC	
0733	REF	2	LAST 1167	12,2189	24124 0		MCDDCNC	MPAC=PERIOD
0734	REF			12,2190	51525 1	PERIODCH	RDDL	QC=PERIOD
0735	REF	2	LAST 115	12,2193	12774 1			TAU.
0736	REF			12,2194	51125 1	PSL	RMK	
0737	REF			12,2195	12771 1		QD	
0738	REF	2	LAST 1167	12,2196	24124 1		MCDDONE	
0739	REF			12,2197	77765 1	SIGN		
0740	REF	2	LAST 1167	12,2198	12774 0		TAU.	
0741	REF	4	LAST 1167	12,2199	15774 0	STCPL		TAU.
0742	REF			12,2200	77650 1	QTC		
0743	REF	1		12,2201	24112 1		PERIODCH	
0744	REF			12,2202	71201 1	MCDDONE	SETPC	CLCAD
0745	REF			12,2203	12001 0			0
0746	REF	2	LAST 115	12,2206	12137 1			XK PNEW
0747	REF	1		12,2207	12025 1	STORE		X
0748	REF			12,2208	54135 0	SIGN		BZ
0749	REF	5	LAST 1167	12,2211	12577 0			TAU.
0750	REF	1		12,2212	24312 0			BADX
0751	REF			12,2213	51440 0	PMN		ABS
0752	REF	2	LAST 1167	12,2214	24312 0			BADX
0753	REF			12,2215	51725 1	PSL		RPL
0754	REF	2	LAST 1167	12,2216	12714 0			XMAX
0755	REF	2	LAST 1167	12,2217	24312 0			BADX
0756	REF			12,2218	51145 0	ST RHDS	CLCAD	RPL
0757	REF	6	LAST 1167	12,2241	12774 0			TAU.
0758	REF	1		12,2242	24152 1		STOREMIN	
0759	REF			12,2243	57545 1	CLCAD	CLCAD	OMP
0760	REF	2	LAST 1167	12,2244	12112 0			XMAX
0761	REF	1		12,2245	14715 1	STCPL		XMIN
0762	REF			12,2246	24117 0			KEPZEPD
0763	REF	4	LAST 1167	12,2247	12512 0	STORE		XMAX
0764	REF			12,2248	77650 1	QTC		
0765	REF	1		12,2251	24155 0		PXCCNF	
0766	REF			12,2252	77745 1	STOREMIN	CLCAD	
0767	REF	2	LAST 1167	12,2253	24777 0			KEPZEPD
0768	REF	2	LAST 1167	12,2254	12115 0		STORE	XMIN
0769	REF			12,2255	57245 1	EXCOMP	CLCAD	QMPR

L CCATIC SUBROUTINES

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0767	REF	7	LAST 1167	12,2156	7274 0		TAU.		
0768	REF	1		12,2157	1130 1		REF22		
0769	REF	1		12,2160	77645 0	ABS			
0770	REF	1		12,2161	16177 1	STEEL	EFFICIENT		
0771	REF	1		12,2162	01553 0		XPIEV		
0772	REF	1		12,2163	77621 1	XDIFF	PCSU		
0773	REF	2	LAST 1167	12,2164	00025 0		X		
0774	REF	2	LAST 1167	12,2165	02643 1	STORE	DELX		
0775	REF	3	LAST 1168	12,2166	62545 0	KEFLCCF	CLCAC	DEC	
0776	REF	3	LAST 1168	12,2167	00025 0		X	X=XREF	
0777	REF	38	LAST 1167	12,2170	41511 0	NORM	PUSH	DC=XSC (+34 CP +32 -N1)	PL AT 2
0778	REF	38	LAST 1167	12,2171	00047 1		X1		
0779	REF	4	LAST 1167	12,2172	53515 1	DMP	SPR*		
0780	REF	4	LAST 1167	12,2173	00011 1		ALPHA		
0781	REF	1		12,2174	21573 1		I -6,1		
0782	REF	1		12,2175	34031 1	STCALL	XT	XI=ALPHA XSC (+6)	
0783	REF	1		12,2176	24421 0		DELTIME		
0784	REF	1		12,2177	44200 0	BDV	BDSC		
0785	REF	1		12,2200	24311 1		TIMEDVEL	UNLIKFLY	
0786	REF	8	LAST 1168	12,2201	02074 0		TAU.		
0787	REF	2	LAST 1167	12,2202	02645 1	STORE	DELT	DELT=DELTINDEF	
0788	REF	2	LAST 1168	12,2203	44246 1	ABS	PCSU		
0789	REF	2	LAST 1168	12,2204	02177 1		EFFICIENT		
0790	REF	2	LAST 1168	12,2205	71244 0	BPL	CLCAC		
0791	REF	1		12,2206	24333 1		KEFFCAVC		
0792	REF	3	LAST 1168	12,2207	00039 0		T		
0793	REF	3	LAST 1168	12,2210	60025 1	PCSU	NORM		
0794	REF	2	LAST 111	12,2211	01551 1		TC		
0795	REF	39	LAST 1168	12,2212	00047 1		X1		
0796	REF	2	LAST 1168	12,2213	60035 0	FDDL	NORM		
0797	REF	2	LAST 1168	12,2214	02642 1		DELX		
0798	REF	23	LAST 1167	12,2215	00051 1		X2		
0799	REF	24	LAST 1168	12,2216	41260 0	XSL,1	DMP		
0800	REF	24	LAST 1168	12,2217	00047 1		X2		
0801	REF	3	LAST 1168	12,2220	02645 1		DELT		
0802	REF	3	LAST 1168	12,2221	56257 1	SLR*	BDV		
0803	REF	3	LAST 1168	12,2222	21002 1		I,1		
0804	REF	3	LAST 1168	12,2223	41542 1	SF1	PUSH	DC=TP IAI L-LX	PL AT 2
0805	REF	3	LAST 1168	12,2224	71244 0	BFL	CLCAC		
0806	REF	1		12,2225	24246 1		PCSU, LX		
0807	REF	4	LAST 1168	12,2226	00025 0		X		
0808	REF	5	LAST 1167	12,2227	00013 0	STORE	XMAX	MOVE MAX PCOUNT IN	PL AT 0
0809	REF	5	LAST 1167	12,2228	45221 1	BDV	PCSU		
0810	REF	2	LAST 1167	12,2229	00015 0		XMIN		
0811	REF	2	LAST 1167	12,2230	51000 0	BDV	BPL		
0812	REF	1		12,2233	24241 1		EXCHNGE		
0813	REF	2	LAST 1168	12,2234	24240 1		EXCHNGE		
0814	REF	2	LAST 1168	12,2235	52145 0	CLCAC	GETC		

L CUBIC SUBROUTINES

US AIRS PAGE NO. 15 E5 S3

0822				12,227	24260 1	OF		
0823	REF	1		12,227	24260 1	NEWDELX		
0824				12,224	45245 1	EXCHANGE	DLCL	
0825	REF	4	LAST 1169	12,224	45245 1		XMIN	
0826	REF	5	LAST 1169	12,224	45245 1		X	
0827				12,224	52175 1	EXCH	GOTO	TC FORCE MFAC +2 TO ZERO
0828	REF	1		12,224	11133 1		DEFS/10	
0829	REF	2	LAST 1169	12,224	24260 1		NEWDELX	
0830				12,224	77745 1	POSDELX	DLCL	
0831	REF	3	LAST 1169	12,224	77745 1		X	
0832	REF	5	LAST 1169	12,224	77745 1	STORE	XMIN	MOVE MIN FOUND IN
0833				12,224	45221 1	BSL	DSL	
0834	REF	6	LAST 1169	12,224	45221 1		XMAX	PL AT 1
0835				12,224	52175 1	BSL	BSL	
0836	REF	1		12,224	24274 1		BSL	
0837	REF	2	LAST 1169	12,224	24274 1		EXCHANGE	
0838				12,224	77745 1		DLCL	
0839				12,224	77745 1		DLCL	
0840	REF	4	LAST 1169	12,224	12444 1	NEWDELX	STORE	
0841				12,224	42244 1		BSL	
0842	REF	2	LAST 1169	12,224	24333 1		BSL	
0843	REF	7	LAST 1169	12,224	11125 1		X	
0844	REF	9	LAST 1169	12,224	14125 1		X	
0845	REF	4	LAST 1169	12,224	11133 1		T	
0846	REF	2	LAST 1169	12,224	11133 1		STORE	TC
0847				12,224	46124 1	EXCHANGE	BSL	
0848	REF	1		12,224	24444 1		CHECKCTR	
0849	REF	3	LAST 1169	12,224	24333 1		KEPCONVG	
0850				12,224	77653 1	GOTO		
0851	REF	1		12,224	24144 1		NEWDELX	ITERATE
0852				12,224	45345 1	EXCHANGE	DLCL	
0853	REF	7	LAST 1169	12,224	11133 1		XMAX	
0854	REF	9	LAST 1169	12,224	77625 1		X	
0855				12,224	52175 1	BSL	GOTO	TC FORCE MFAC +2 TO ZERO
0856	REF	2	LAST 1169	12,224	11133 1		DEFS/10	
0857	REF	3	LAST 1169	12,224	24260 1		NEWDELX	
0858				12,224	77645 1	BSL	BSL	
0859	REF	8	LAST 1169	12,224	11133 1		XMAX	
0860				12,224	77745 1	SIGN		
0861	REF	6	LAST 1169	12,224	12174 1		BSL	
0862	REF	10	LAST 1169	12,224	77625 1		X	
0863				12,224	77653 1	GOTO		

L CATIC SUPPLIES

USER'S PAGE NO. 20 EE 52

0864	REF	1	12,231	2414	1	STOREDS	
0875			12,2311	51145	1	TIMECVL DLOAD	X WAS TOO HIGH
0888	REF	11	12,2312	00025	0		X
0895	REF	1	12,2313	2432	1	NEGTCVFL	
0891	REF	1	12,2314	01114	0	STORE	XW X
0892			12,2315	70545	1	CMATCVFL DLOAD	SE1
0893	REF	5	12,2316	01643	1		DLX
0894	REF	6	12,2317	02643	1	STORE	DELX
0895			12,2320	44254	1	BZ	BPSL
08955	REF	1	12,2321	2112	1		KFP T
0896	REF	12	12,2322	0125	0		X
0897	REF	1	12,2323	1425	0	STGDL	X
0898	REF	4	12,2324	01551	1		TC
0899	REF	5	12,2325	00537	0	STORE	T
0900			12,2326	77650	1	CCD	
0901	REF	1	12,2327	24267	1		BEALCTC
09011	REF	4	12,2328	01115	0	NEGTCVFL STORE	XW X
09012			12,2331	77651	1	CCD	
09012	REF	1	12,2332	24215	0	CMATCVFL	
0892			12,2333	44545	0	KFPCCNVG DLOAD	SK4F
0893	REF	8	12,2334	00141	1		P1
0894			12,2335	74225	1	DSL	VXSC
0895	REF	1	12,2336	00035	1		XSCC(XI)
0896	REF	3	12,2337	02647	0		UPRECT
0897			12,2340	65372	1	VSL1	PDEL
0898	REF	14	12,2341	00025	0		X
0899			12,2342	60316	0	DSG	ICR4
0900	REF	4	12,2343	00047	1		X1
0901			12,2344	57275	0	EMPR	DMP
0902	REF	2	12,2345	00023	0		1/ CCTVU
0903	REF	15	12,2346	00025	0		X
0904			12,2347	53615	1	EMP	SRF#
0905	REF	1	12,2350	00023	1		S(XT1)
0906			12,2351	21572	1		0 - 7, 1
0907			12,2352	77621	1	BPSL	
0908	REF	6	12,2353	00037	0		T
0909			12,2354	74352	0	SLL	VXSC
0910	REF	5	12,2355	01511	0		VFFCT
0911			12,2356	53372	1	VSL1	VAD
0912			12,2357	77712	0	VSL4	
0913	REF	15	12,2358	01535	0	STORE	PCV
0914			12,2359	00246	1	ARVAL	NRW
0915	REF	25	12,2360	00050	1		X2
0916	REF	1	12,2361	14043	0	STGDL	CCACRA
0917	REF	1	12,2362	01031	0		XT
0918			12,2363	45275	0	EMPR	DSL
0919	REF	2	12,2364	00033	1		S(XT1)
0920	REF	1	12,2365	11015	0		01/12P

PL AT 0

PCV (+29 OR +27)

L Cyclic Subroutine

LUMIN'S PAGE NO. 21 OF 52

0921 12, 371 76476 1
 0922 R F 1 12, 2171 00121 1
 0923 12, 275 52625 1
 0924 R F 14 LAST 117 12, 37 00125 1
 0925 12, 274 56611 1
 0926 12, 375 74271 1
 0927 R F 5 LAST 117 12, 376 11143 1
 0928 R F 4 LAST 117 12, 377 12647 1
 0929 12, 378 12647 1
 0930 R F 2 LAST 117 12, 379 00135 1
 0931 12, 380 56251 1
 0932 12, 381 56612 1
 0933 R F 2 LAST 1171 12, 382 11143 1
 0934 12, 383 74221 1
 0935 R F 1 12, 384 11131 1
 0936 R F 4 LAST 117 12, 385 11511 1
 0937 12, 386 4245 1
 0938 12, 387 77625 1
 0939 R F 13 LAST 114 12, 388 62214 1
 0940 R F 7 LAST 117 12, 389 76437 1
 0941 R F 6 LAST 117 12, 390 15551 1
 0942 R F 17 LAST 1171 12, 391 18725 1
 0943 R F 2 LAST 116 12, 392 11553 1
 0944 12, 393 77651 1
 0945 R F 3 LAST 117 12, 394 72112 1

DMP SLIR
 PRC TMU
 DMP SLR#
 X
 D -3,2
 D V VXS
 RCN DPH
 LR FCT
 VSL 1 PDDL $Q[UPPCT(XI S(XI))-1]X PRC TMU/RCV (+15$
 XSCC(XI) CP +12) PL AT 6
 SLR# D V
 D -4,2
 RCN DPH
 RCL VXS
 D1/256
 VBE CT
 VSL# PL AT 0
 VBE CT
 STACH
 STCDL VCV $VCV (+7 (0 +4))$
 T
 STCDL TC
 X
 STJPC XPRFV
 CTC
 XPRPTN

L COMIC SLAP LINES

LSEK'S PAGE NO. 22 LF 53

0951	REF 4 LAST 1177	12,2421	77776 1	DELTIME	EX17	MFAC=X1 (+6), DC=XSC (+34 CR +32 -A1)
0952		12,2422	07225 0		TC	PCLY
0953		12,2423	00010 0		DEC	8
0954		12,2424	02525 1		ZDEC	.00232334
0955		12,2425	12525 1			
0956		12,2426	67255 0		ZDEC	-.266666684
0957		12,2427	75255 1			
0958		12,2428	15 1 1		ZDEC	.46349155
0959		12,2429	23771 1			
0960		12,2430	64342 0		ZDEC	-.261196675
0961		12,2431	42674 0			
0962		12,2432	64563 1		ZDEC	.210153242
0963		12,2433	14645 1			
0964		12,2434	75172 0		ZDEC	-.06221451
0965		12,2435	52672 0			
0966		12,2436	00616 1		ZDEC	.026268812
0967		12,2437	14331 0			
0968		12,2438	77633 1		ZDEC	-.06162316
0969		12,2439	40512 0			
0970		12,2440	00723 0		ZDEC	.001177342
0971		12,2441	11210 1			
0972		12,2442	77774 0		ZDEC	-.00199055
0973		12,2443	67515 0			
0974	REF 224 LAST 1147	12,2444	6142 1		TC	INTPRCT
0975	REF 3 LAST 1170	12,2445	1432 1		STCOL	S(XI)
0976	REF 3 LAST 1170	12,2446	01131 0			XI
0977		12,2447	77776 1		EX17	
0978	REF 5 LAST 1172	12,2448	7225 0		TC	PCLY
0979		12,2449	00010 0		DEC	8
0980		12,2450	01207 0		ZDEC	.03125001
0981		12,2451	01107 1			
0982		12,2452	72525 0		ZDEC	-.166666719
0983		12,2453	52516 0			
0984		12,2454	13311 1		ZDEC	.345555412
0985		12,2455	15327 1			
0986		12,2456	62776 0		ZDEC	-.416347410
0987		12,2457	54733 1			
0988		12,2458	11176 1		ZDEC	.284562054
0989		12,2459	13267 0			
0990		12,2460	73410 0		ZDEC	-.140117894
0991		12,2461	51614 0			
0992		12,2462	01446 1		ZDEC	.049247387
0993		12,2463	32641 1			
0994		12,2464	77451 1		ZDEC	-.013091523
0995		12,2465	65233 0			
0996		12,2466	00155 1		ZDEC	.002866389
0997		12,2467	37216 1			
0998		12,2468	77747 1		ZDEC	-.001529414
0999		12,2469	52226 0			
1000	REF 224 LAST 1172	12,2470	00142 1		TC	INTPRCT

L CONTROL SUBROUTINES

USERS PAGE NO. 22 PAGE 53

0984			12,2519	626 5 1	DMP	SRF*	PL AT 0
0981			12,2514	626 1 0		OC	
0982			12,2515	21574 1		0 -5,1	
0980	R	2	LAST 1171	12,2510	12125 1	STORE	XSCC(X1) (+34 OF +31)
0984			12,2517	724 5 0	DMP	SL1	
0985	REF	1	LAST 1174	12,2511	65234 1	KEPC1	
0986			12,2511	65234 1	RTB	PCPL	XCH WITH PL. (C=C1 XSCC(X1) (+48 OF +46
0987	REF	5	LAST 1172	12,2511	21634 0	TFACD	PL AT 0,2
0988			12,2512	526 5 1	DMP	SRF*	
0989	REF	4	LAST 1172	12,2511	65234 1	S(X1)	
0990			12,2516	21574 1		0 -5,1	
0991			12,2517	724 5 0	DMP	SL1	
0992	REF	2	LAST 1174	12,2517	65234 0	KEPC2	
0993			12,2521	65234 1	RTB	PCPL	3C=C2 XSCC(X1) (+35 OF +33) PL AT 6
0994	REF	1	LAST 1172	12,2521	21634 0	TPMODE	
0995	REF	5	LAST 1170	12,2522	76261 1	P1	
0996			12,2522	76261 1	SD	TAD	PL AT 3
0997			12,2524	21634 1		5	
0998			12,2525	413 1 0	ACOM	DMP	TO PRESERVE SIGNIF.
0999	REF	41	LAST 1170	12,2526	76261 1	X1	
1000	REF	18	LAST 1171	12,2527	76261 0	X	
1001			12,2530	76261 0	SE*	TAD	X(C2 XSCC(X1) +F1) (+49 OF +46) PL AT 0
1002			12,2541	21574 1		0 -2,1	
1003			12,2532	672 2 0	STAP	DMP	
1004	REF	4	LAST 1170	12,2533	76261 0	1/INOTML	
1005	REF	18	LAST 1171	12,2534	76261 0	STORE	T
1006			12,2535	76261 0	RVC		

L CONIC SUBROUTINES

USER'S PAGE NO. 24 E5 S3

1007			12,2536	71214 0	ITERATED BOUNDER ELONG		
1008	REF	1	12,2537	71214 1	SLIPPSW		
1009	REF	1	12,2540	24616 1	FIRSTIME		
1010	REF	1	12,2541	11237 0	DEF		
1011			12,2542	62225 1	DSL		
1012	REF	1	12,2543	62262 0	DEPTREV		
1013	REF	42	12,2544	00047 1	X1		
1014			12,2545	60325 0	PDOL		
1015	REF	1	12,2546	00015 0	DELINDEF		
1016	REF	26	12,2547	01055 1	X2		
1017			12,2548	41260 0	DMP		
1018	REF	27	12,2551	01047 1	X2		
1019	REF	3	12,2552	62760 1	DELDEF		
1020			12,2553	56257 1	ODV		PI UP 2
1021			12,2554	21202 1	1,1		
1022			12,2555	42142 1	REF		
1023	REF	1	12,2556	14351 1	REFPSW		
1024	REF	1	12,2557	24562 0	SGNCHCK		
1025			12,2558	75246 0	SIGN		
1026	REF	4	12,2559	62760 1	ARS		IN CASE 2ND DERIV. CHANGED SIGN, MUST DISREGARD IT TO FIND MIN.
1027			12,2562	51006 0	SGNCHCK		
1028	REF	1	12,2563	24621 0	PLSH		TRIAL DELINDEF PL DOWN 2
1029			12,2564	43145 0	RICAD		
1030	REF	1	12,2565	62766 1	RCN		
1031	REF	2	12,2566	04311 0	INDIP		
1032	REF	1	12,2567	24571 1	REFPSW		
1033	REF	1	12,2568	60017 1	MINCHECK		
1034			12,2571	45221 1	STORE		IF NOT 2ND ORDER, CAN MOVE MAX BOUND IN.
1035	REF	1	12,2572	01011 1	MINCHECK		
1036			12,2573	51000 0	RCV		
1037	REF	1	12,2574	24600 1	MCNCEFL		
1038	REF	2	12,2575	24630 1	MCNCEFL		
1039			12,2576	77550 1	GCTC		
1040	REF	1	12,2577	24632 0	DELCK		
1041			12,2600	45345 1	MCNCEFL		
1042	REF	2	12,2601	01011 1	DSL		TRIAL DELINDEF WOULD EXCEED MIN BOUND
1043	REF	2	12,2602	62766 1	MIN		
1044			12,2603	52005 0	INDIP		
1045	REF	3	12,2604	11033 1	GCTC		
1046	REF	1	12,2605	24634 0	REF/1		
1047			12,2606	41345 0	NEWDEL		
1048	REF	2	12,2607	01011 1	FIRSTIME		
1049	REF	1	12,2610	00051 0	DMP		
1050			12,2611	41325 0	TWEAKIT		ELCAD TWEAKIT(400) SENSITIVE TO CHANGE. S2(410) SHOULDNT CONTAIN PI ORDER DATES

L CONIC SUBROUTINE

LSPEC'S PAGE NO. 25 EF 53

1051	REF	2	LAST	1174	12,2617	77725	1			MAX
1052	REF	2	LAST	1174	12,2617	77725	1			TWEEKIT
1053					12,2614	77725	1		DSL	
1054					12,2617	5216	1		SICN	CCTD
1055	REF	5	LAST	1174	12,2617	5277	1			FIELDP
1056	REF	7	LAST	1174	12,2617	245	1			SIGCHECK

1057					12,2620	43145	1	PCDEL	ELFAD	RCN
1058	REF	2	LAST	1174	12,2621	5277	1			INDEX
1059	REF	4	LAST	1174	12,2622	14311	1			ORIFRSH
1060	REF	1			12,2622	2462	1			MAXCHECK
1061	REF	4	LAST	1174	12,2624	0	11	1	STORE	MIN

IF ACT 2ND CPELP, CAN MOVE MIN FOUND IN.

1062					12,2625	45221	1	MAXCHECK	PCSU	DSU
1063	REF	3	LAST	1174	12,2626	5277	1			MAX
1064					12,2627	500	1		BOV	BMN
1065	REF	1			12,2628	2463	1			MCPSDEL
1066	REF	2	LAST	1174	12,2629	2463	1			MCPSDEL
1067					12,2630	77745	1	DEL IK	ELI AD	
1068					12,2632	00001	1			QC
1069	REF	2	LAST	1174	12,2634	77745	1	NEWDEL	STORE	DELINDEF
1070					12,2635	77745	1		BOV	

1071					12,2636	45245	1	MCPSDEL	ELI AD	DSL
1072	REF	4	LAST	1174	12,2637	77745	1			MAX
1073	REF	6	LAST	1174	12,2640	77750	1			INDEX
1074					12,2641	5277	1		EXP	GCIC
1075	REF	4	LAST	1174	12,2643	11133	1			OPS/IN
1076	REF	2	LAST	1174	12,2642	24634	1			NEWDEL

1077	REF	125	LAST	1174	12,2644	4	4757	1	CHSACT	CS	QN
1078	REF	56	LAST	1174	12,2645	50	121	1		INDEX	FIXLOC
1079	REF	2	LAST	1174	12,2646	6	0726	1		AD	INTERCTR
1080	REF	57	LAST	1174	12,2647	50	121	1		INDEX	FIXLOC
1081	REF	4	LAST	1174	12,2648	54	126	1		TS	INTERCTR
1082	REF	725	LAST	1174	12,2649	54	154	1		TS	MPAC
1083	REF	58	LAST	1174	12,2650	0	1254	1		TC	MANZIC

L ORBITAL SUPERIMPOSITION

USER'S PAGE NO. 27 EE S3

1135 REF 1 LAST 45 4, 2 11
 1136 4, 2 11
 1137 REF 2 LAST 45 4, 2 11 16* 16*
 1138 REF 2 LAST 45 4, 2 11 16* 16*
 1139 REF 2 LAST 45 4, 2 11 16* 16*
 1140 REF 2 LAST 45 4, 2 11 16* 16*
 1141 REF 2 LAST 45 4, 2 11 16* 16*
 1142 REF 2 LAST 45 4, 2 11 16* 16*
 1143 REF 2 LAST 45 4, 2 11 16* 16*
 1144 REF 2 LAST 45 4, 2 11 16* 16*
 1145 REF 2 LAST 45 4, 2 11 16* 16*
 1146 REF 2 LAST 45 4, 2 11 16* 16*
 1147 REF 2 LAST 45 4, 2 11 16* 16*
 1148 REF 2 LAST 45 4, 2 11 16* 16*
 1149 REF 2 LAST 45 4, 2 11 16* 16*
 1150 REF 2 LAST 45 4, 2 11 16* 16*
 1151 REF 2 LAST 45 4, 2 11 16* 16*
 1152 REF 2 LAST 45 4, 2 11 16* 16*
 1153 REF 2 LAST 45 4, 2 11 16* 16*
 1154 REF 2 LAST 45 4, 2 11 16* 16*
 1155 REF 2 LAST 45 4, 2 11 16* 16*
 1156 REF 2 LAST 45 4, 2 11 16* 16*
 1157 REF 2 LAST 45 4, 2 11 16* 16*

SETLOC CONICS
 BANK

COUNT* 88/CONIC

REF 2 LAST 45 4, 2 11 16* 16*

REF 2 LAST 45 4, 2 11 16* 16*

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L CUNIC SUBROUTINES

USER'S PAGE NO. 28 EE 53

116P	REF	2	LAST 116P	12, 200		SETLOC CUNICS		
116C				12, 232		RANK		
116P	REF	2	LAST 116P TO	1177:	45P 45P*	COUNT#	\$/CUNIC	
1161				12, 732	40220 0	STQ	SETPD	PL AT 0
1162	REF	1		12, 2733	12710 0		RTTIT	
1163				12, 2734	1161 0		0	
11635				12, 735	774 0 1	BOV		
11636				12, 2736	24737 1		+1	
1164				12, 737	6375 0	VICAF	PRVL	SFTUP FOR PARM CALL
116P	REF	10	LAST 69P	12, 740	12555 0		VVIC	FL AT 6
1166	REF	12	LAST 1176	12, 2741	12744 1		VVIC	
1167				12, 2742	77624 1	CALL		
116P	REF	1		12, 2743	1146 0		PAFAM	
1169				12, 2744	4500 0	PRV	CALL	PL AT 6
117	REF	1		12, 2745	24764 1		CCGACVEL	
1171	REF	1		12, 2746	24767 1		GETX	
1172				12, 2747	42145 0	COMMNUCT	ELCAC	
1173	REF	8	LAST 1176	12, 2748	0031 0		XT	
1174	REF	1		12, 2751	14210 1		INFINFLG	
1175	REF	1		12, 2752	25752 0		ASTCUNIC	
1176				12, 2753	45014 0	CLEAR	CALL	
1177	REF	1		12, 2754	44272 0		CCGAFLAG	
1178	REF	2	LAST 1168	12, 2755	24421 0		DELTINE	
1179				12, 2756	45014 0	ECN	CALL	
1180	REF	7	LAST 162	12, 2757	03766 0		PVSW	
1181	REF	1	LAST 117P	12, 2758	02710 0		PRINT	
1182	REF	1		12, 2759	24653 1		NEWSTATE	
1183				12, 2760	77650 1	GOTO		
1184				12, 2761	02710 0		PRINT	
1185				12, 2762	77614 1	CCGACVEL	SETGC	
1186	REF	2	LAST 117	12, 2763	04133 0		CCGAFLAG	
1187	REF	2	LAST 1178	12, 2764	25752 0		ASTCUNIC	
11872				4, 146		RANK	4	
11874	REF	4	LAST 1177	4, 146		SETLOC	CUNICS	
11876				4, 146		RANK		
11878	REF	2	LAST 1177 TO	1177:	25 45P*	COUNT#	\$/CUNIC	
118P				4, 146	43120 1	STQ	CLLAP	MPAC=VIVEC, OD=RIVEF
1189	REF	2	LAST 126	4, 147	02753 1		RTAPRM	FL AT 6
1190	REF	7	LAST 771	4, 148	02665 1		NEWMSW	
11901				4, 149	77514 1	CLEAR		
11912	REF	2	LAST 1178	4, 150	04273 0		CCGAFLAG	
1191				4, 151	45131 0	SSP	CALL	
1192	REF	7	LAST 772	4, 152	12673 1		GFCMGEN	
1193				4, 153	27777 0		37777	
1194				4, 154	11112 0		GFCM	
119P				4, 155	14145 0	STREL	36P	GAMMA ALWAYS LESS THAN 180DEG
119P				4, 156	56261 1	SP	DDV	MPAC=SGA (+1), CC=CSGA (+1) FL AT 2
								36P=SGA (+1) PL AT 6

1 CIRCULAR SUBSTITUTIONS

LUMINAPY PAGE NO. 25 55 S3

1197			4, 2, 1	27616	5		
1198			4, 2, 62	6745	360		
1199			4, 2, 63	32746 1	STOVL*	CCCA	
1200			4, 2, 64	16355		MLTARIF, 1	
1201			4, 2, 65	14717 1	STOVL	1710	
1202			4, 2, 66	2723 1		MACVFC2	
1203			4, 2, 67	6316 1	PSC	NC00	
1204			4, 2, 68	33147 1		X1	
1205			4, 2, 69	41275 1	EMER	CMC	
1206			4, 2, 70	1017 1		1/ML	
1207			4, 2, 71	11141 1		R1	
1208			4, 2, 72	77657 0	SP#		
1209			4, 2, 73	21576 1		C -3, 1	
1210			4, 2, 74	44276 0	FUSE	PESU	QC=K1 VISO/ML (+6)
1211			4, 2, 75	11725 0		01/32	PL AT 2
1212			4, 2, 76	16742 1	STOVL	01A	R1A (+6)
1213			4, 2, 77	6215 1	EMF	NCRM	
1214			4, 2, 78	10745 1		360	
1215			4, 2, 79	33147 1		X1	
1216			4, 2, 80	52615 1	EMF	SP#	
1217			4, 2, 81	2745 1		360	
1218			4, 2, 82	21575 1		C -4, 1	
1219			4, 2, 83	62742 0	STOVL	P	P (+4)
1220			4, 2, 84	77653 1	STOVL		
1221			4, 2, 85	12753 1		PTAPPV	

GAP: ASSEMBLE REVISION 114 OF AEC PROGRAM LUMINARY BY NASA 2021112-071

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L COMPIC SUBROUTINES

USERS PAGE NO. 30 FS S3

1225				04,3112	77656 1	CEFM	UNIT		MPAC=V2VEC, CP=R1VEC	PL AT 6
1226	REF	2	LAST 126	04,3112	16712 1		STEEL	U2	U2 (+1)	
1227				04,3114	0045 0			360		
1228	REF	4	LAST 1175	04,3115	2672 0		STEEL	MAIVEC2		PL AT 6
1229				04,3116	77656 1		UNIT			
123	REF	5	LAST 1176	04,3117	02722 1		STORE	UP1	UP1 (+1)	
1231				04,3120	72441 0		ECT	SL1		
1232	REF	2	LAST 1180	04,3121	02712 1			U2		
1233				04,3122	77725 1		PDDL		CD=CSTH (+1)	PL AT 2
1234				04,3123	0045 0			360		
1235	REF	12	LAST 1175	04,3124	2441 1		STEEL	P1	P1 (+29 FR +27)	
1236	REF	6	LAST 1180	04,3125	02722 1			UR1		
1237				04,3126	76435 1		VAV	VSL1		
1238	REF	4	LAST 1180	04,3127	02712 1			U2		
1239				04,3130	75214 1		PCN	SIGN		
1240	REF	8	LAST 1178	04,3131	275 0			NC NSW		
1241	REF	1		04,3132	11144 0			HAVE NORM		
1242				04,3133	02673 1			GEOMSGN		
1243				04,3134	40756 0		UNIT	HCV		
1244	REF	1		04,3135	11142 0			COLINEAR		
1245	REF	6	LAST 772	04,3136	16674 0	UNITACFM	STEEL	UN	UN (+1)	
1246				04,3137	0045 0			360		
1247				04,3140	43555 0		SIGN	PVQ	MPAC=SNTH (+1), 340=SNTH.SNTH (+2)	
1248	REF	9	LAST 1180	04,3141	02673 1			GEOMSGN		
1249				04,3142	52162 0	COLLINEAR	VER1	GOTO		
125	REF	1		04,3143	11136 0			UNITACFM		
1251				04,3144	75246 0	HAVE NORM	BEVAL	SIGN		
1252	REF	17	LAST 1180	04,3145	02673 1			GEOMSGN		
1253				04,3146	77616 0		FVC		MPAC=SNTH (+1), 340=SNTH.SNTH (+2)	

L C N T C S I P R U T I T F C

L S E P ' S F A C A C . 31

F 5 S 3

1254			12,2767		BANK 12	
1255	F	1	12,2767		SFTLCC CCN105	
1256			12,2767		BANK	
1256F	000	1	1173	20 6244	COUNT* 11/0010	
1257			12,2767	64274 1	AXT,2	ASSUMES F (+4) IN "PAC"
1258			12,2771	00013 1		
1259	000	26	12,2771	00052 1	S2	
1260			12,2772	0001 1	1	
1261			12,2772	77414 1	CLEFR	
1262	000	1	12,2774	14276 1	3015W	
1263			12,2775	65246 1	PWPI	PL AT 2
1264	000	0	12,2776	12732 1	CSTH	
1265			12,2777	44242 1	SQ1	RFSU
1266	000	2	12,2777	11221 1	D1/4	
1267			12,2777	54329 1	FDOL	SPP
1268	000	1	12,2777	0272 1	SNTH	PL AT 4
1269			12,2777	2167 1	6	
1270			12,2777	77521 1	FCV	PL AT 2
1271			12,2777	776 1	FCV	
1272	000	1	12,2777	25122 1	PSL	360CHECK
1273			12,2777	41225 1	DMP	
1274	000	3	12,2777	02766 1	CCGA	PL AT 0
1275			12,2777	41132 1	SL2*	FCV
1276	000	1	12,2777	25122 1		360CHECK
1277			12,2777	634 1	WLDOP	DSC
1278			12,2777	05341 1		DD=W (+5)
1279	000	1	12,2777	05195 1	TICAD	PDUL
1280	000	1	12,2777	02742 1		WPRC
1281			12,2777	762 1		FIA
1282			12,2777	76442 1	SP4	TOR
1283	000	1	12,2777	25245 1	BMH	SQNT
1284			12,2777	424 1		INFINITY
1285			12,2777	61 1	ROLAC	DAC
1286	000	1	12,2777	25122 1	BOV	TLX,2
1287	000	1	12,2777	25122 1		R5FTX2
						WLDOP
1288			12,2777	41164 1	RODV	BFV
1289	000	2	12,2777	11015 1		01/128
1290	000	2	12,2777	25245 1		INFINITY
1291			12,2777	41440 1	PELYCCTE	EMT
1292	000	2	12,2777	25245 1		INFINITY
1293			12,2777	77716 1	FSQ	
1294			12,2777	41311 1	ACFM	DMP
1295	000	47	12,2777	02747 1		X1
1296	000	1	12,2777	02742 1		01A
1297			12,2777	77457 1	SCDA	EXIT
1298			12,2777	21567 1		-100,1
1299	000	6	12,2777	7225 1	TC	PCLY

L Cyclic SUBROUTINES

USER'S PAGE NO. 22 EF 52

1300		12,342	02115 1	DEC	5	
1301		12,343	21110 0	ZDEC	.5	
1301		12,344	00110 1			
1302		12,345	72525 0	ZCFR	-.166666770	
1302		12,345	52471 1			
1303		12,347	13146 1	ZDEC	.111111192	
1303		12,345	15713 0			
1304		12,351	75556 0	ZDEC	-.71411186	
1304		12,352	4521 0			
1305		12,353	11615 1	ZDEC	.55513232	
1305		12,354	13552 0			
1305		12,355	75371 0	ZDEC	-.047264058	
1306		12,356	63777 1			
1307		12,357	01232 0	ZDEC	.04694214	
1307		12,356	27357 0			
1308	REF 5 LAST 1172	12,361	542 1	TC	INTERPT	
1308		12,362	764 1	DMP	SLIP	PL AT 00
1310		12,363	43716 0	PUSH	PCN	
1311	REF 1 LAST 1181	12,364	14216 1		360SW	
1312	REF 1	12,364	25172 1		TRUE360x	
1313		12,366	60316 0	XCOMMON	ACPM	
1314	REF 49 LAST 1191	12,367	08147 1	ESC	X1	
1315		12,367	53535 1	END	SP=x	
1316	REF 7 LAST 1181	12,371	12742 1		R1A	
1317		12,372	21565 1		-120,1	
1318	REF 6 LAST 1178	12,373	14731 0	STOCL	XI	XI (+6)
1319	REF 12 LAST 118	12,374	0141 1		R1	
1320		12,375	75542 0	SP1	SQRT	
1321		12,375	41306 1	ROUND	DMP	
1322		12,377	77632 0	SL4R		PL AT C
1323	REF 22 LAST 1176	12,311	10125 0	STORE	X	X (+17 OF +16)
1324		12,311	60216 0	ESC	ACPM	
1325	REF 40 LAST 1182	12,312	02447 1		X1	
1326		12,313	41325 0	PDDL	DMP	OC=XSQ (+24 DP +32 -N1)
1327	REF 5 LAST 1175	12,314	02740 0		P	PL AT 2
1328	REF 14 LAST 1130	12,315	11141 1		R1	
1329		12,316	75452 0	SL3	SQRT	
1330		12,317	56455 0	DMP	SL30	
1331	REF 4 LAST 1181	12,317	12766 1		COGA	
1332	REF 2 LAST 1173	12,311	14043 0	STOCL	K5PC1	
1333	REF 8 LAST 1182	12,312	02742 1		R1A	
1334		12,313	43121 0	RPSU	CLFA	
1335	REF 2 LAST 1166	12,314	11117 1		R1/64	
1336	REF 2 LAST 1171	12,315	14270 0		INFINF16	
1337	REF 2 LAST 1173	12,316	01145 0	STORE	K5PC2	
1338		12,317	77616 0	END		

L COTIC SLEIGHTS

LSE'S FACT NO. 33 55 53

1340		12, 110	77774 0	RESETX2 EXT,2		
1341		12, 111	77773 1			
1341		12, 112	51101 1	RECHECK SETPD	RPL	
1342		12, 113	1 1		DC	
1342	OFF	1	12, 114	25127 1	INVPSEGN	
1344		12, 125	77514 1	SFT		
1345	OFF	2	12, 126	14176 1	360SW	
1346		12, 127	75546 1	INVPSEGN LOAD	SGRT	
1347	OFF	6	12, 113	7774	P	
1348		12, 113	41225 1	FDDL	DMP	DC=SGRT(F) (+2) PL AT 2
1349	OFF	1	12, 113	12715 1	SNTH	
1350	OFF	5	12, 113	12715 1	CCCA	
1351		12, 114	65257 1	SLI	PCIL	DC=SNTH CCA (+5) PL AT 4
1352	OFF	1	12, 114	12715 1	CSTH	
1353		12, 126	43212 1	SG4	DAC	
1354	OFF	1	12, 117	11125 1	D1/32	
1355		12, 114	41225 1	CSU	DMP	PL AT 2, D
1356		12, 114	55111 1	ACOM	HCFV	
1357	OFF	1	12, 114	11125 1	X1	
1358	OFF	1	12, 114	11125 1	SNTH	
1359		12, 114	51457 1	SLP*	ARS	NOTE: REF 36 CASE TREATED DIFFERENTLY
1360		12, 114	21174 1		0 - 5, 1	
1361		12, 114	63416 1	PHSE	DSC	DC=1/W (-1) PL AT 2
1362		12, 114	14142 1	STCCL	340	
1363	OFF	1	12, 114	11123 1	D1/16	
1364		12, 114	63416 1	1/WLCCP	DSC	2P=F (+4) PL AT 4
1365		12, 114	65214 1	PT	PCIL	PL AT 7
1366	OFF	11	12, 114	21434 1	TRMCCF	
1367	OFF	5	12, 114	12742 1	R1A	
1368		12, 114	41415 1	EMP	SG4	
1369		12, 114	11143 1		340	
1370		12, 117	77771 1	TAD		PL AT 4
1371		12, 114	75411 1	RAN	SGRT	
1372	OFF	4	12, 114	25215 1	INFINITY	
1373		12, 114	77615 1	DAD		PL AT 2
1374		12, 114	61414 1	TIX,2	ACOM	
1375	OFF	1	12, 114	25111 1	1/WLCCP	
1376	OFF	51	12, 114	11147 1	X1	
1377		12, 114	77615 1	HCFV		PL AT C
1378		12, 114	52157 1	SLP*	GCTC	
1379		12, 114	21172 1		0 - 7, 1	
1380	OFF	1	12, 114	25031 1	POLYCCCF	
1381		12, 117	51145 1	TRMCCP CLDAD	BMA	
1382	OFF	1	12, 117	12742 1	R1A	

L Cyclic Subroutines

USER'S PAGE NO. 24 P5 S2

1383	2 F	5	LAST 1183	12,3174	25215 1		INFINITY
1384				12,3175	64365 1	SGRT	ACRM
1385	P F	52	LAST 1183	12,3176	00047 1		XL
1386				12,3177	53655 1	ECDV	SL*
1387	FFF	2	LAST 1187	12,3178	11537 2		261SC
1388				12,3179	20176 0		0 -3,1
1389				12,3180	41425 1	ESU	PUSH
1390				12,3181	77650 1	GCTC	
1391	P F	1		12,3182	25066 0		XCOMMON
1392				12,3183	40011 1	INFINITY SETPE	BFV
1393				12,3184	11011 0		0
1394	FFF	1		12,3185	25211 2		OVFLCLR
1395				12,3186	43414 1	OVFLCLR SET	EVG
1396	FFF	3	LAST 1186	12,3187	24271 1		INFINFLG

WD=2P1/SGRT(R1A) -X

PL AT 11,2

NO SOLUTION EXISTS SINCE CLOSURE THROUGH INFINITY IS REQUIRED

L C TO SUBROUTINES

USER'S PAGE NO. 35 ES 53

1327				12, 1213	40220 0	LAMPRT	STQ	SETPD		
1328	REF	5	LAST 126	12, 1213	32711 0			PTNL	REF	
1329				12, 1214	30010 0			DD		
1329.5				12, 1215	77615 1		PCV			
1330				12, 1216	25217 1			+1		
1400				12, 1217	76614 0		FLFAP	VLFAC*		
1401	REF	1		12, 1218	12674 0			SCLNS*		
1404	REF	6	LAST 1176	12, 1219	11115 0			MUTABE(,)		
1404	REF	4	LAST 1176	12, 1220	14117 1		STCOL	1/MU		
1405	REF	3	LAST 1187	12, 1221	12671 0			TRESI*FD		
1406				12, 1222	77615 0		ENF*			
1407	REF	1		12, 1223	11124 1			BFF19		
1408	REF	2	LAST 126	12, 1224	77614 0		STOFF	FPSJICML		
1409				12, 1227	77214 0		SFT	VLCAP		
1410	REF	2	LAST 1174	12, 1228	111474 0			SLOPESW		
1411	REF	6	LAST 1185	12, 1231	12665 0			RIVEC		
1412				12, 1232	45115 0		PDVL	CALL	DD=HVIC (+25 LR +27)	PL AT 6
1413	REF	1	LAST 1185	12, 1233	12663 0			R2VEC	MPAC=P2VEC (+25 OR +27)	
1414	REF	2	LAST 1178	12, 1234	11112 0			GFCM		
1415	REF	10	LAST 1183	12, 1235	16730 1		STCOL	SNTH	DD=CSTH (+1)	PL AT 2
1416	REF	5	LAST 1180	12, 1236	12770 0			MAGVER2		
1417				12, 1237	65210 0		NCFM	PDCL		PL AT 4
1418	REF	54	LAST 1184	12, 1238	11147 1			X1		
1419	REF	15	LAST 1182	12, 1239	11141 1			P1		
1420				12, 1240	56262 1		SF1	DDV		PL AT 2
1421				12, 1241	65257 1		SL*	PDCL	DXCH WITH CD, DD=R1/P2 (+7)	PL AT 0,2
1422				12, 1242	20172 0			1 -6,1		
1423				12, 1243	77626 0		STORP			
1424	REF	7	LAST 1179	12, 1244	71145 1		STORE	CSTH	CSTH (+1)	
1425				12, 1247	44242 1		SPI	BDSU		
1426	REF	5	LAST 1181	12, 1248	11121 1			D1/4		
1427	REF	3	LAST 126	12, 1249	12734 0		STORE	1-CSTH	1-CSTH (+2)	
1428				12, 1250	52116 0		ROUND	BZF		
1429	REF	1		12, 1251	25473 0			261LAMP		
1430				12, 1254	55211 0		NCFM	PDCL		PL AT 4
1431	REF	54	LAST 1186	12, 1255	111047 1			X1		
1432				12, 1256	111011 0			DD		
1433				12, 1257	56242 1		SF1	DDV		PL AT 2
1434				12, 1258	75457 0		SL*	SCPT		
1435				12, 1259	21176 0			1 -3,1		
1436				12, 1260	54325 1		PDCL	SF	2F=SQRT(2P1/P2(1-CSTH)) (+5)	PL AT 4
1437	REF	11	LAST 1188	12, 1263	12730 1			SNTH		
1438				12, 1264	21167 1			6		
1439				12, 1265	44271 1		DDV	DDH		PL AT 2
1440	REF	3	LAST 1185	12, 1266	12734 0			1-CSTH		
1440.1				12, 1267	77626 0		STORP			
1440.2	REF	1		12, 1268	77760 0		STORP	CCGMAX		
1441				12, 1269	50111 1		PCV	BAN	IF DVFL, CCGMAX=CCGLPLIM	
1442	REF	1		12, 1270	25277 1			UPLIM	IF NEG, USE EVEN IF LT CCGLCLIM, SINCE	

L COMB SURPLIMITS

USER'S PAGE NO. 37 F5 S3

1484 12,334 44247 1
 1485 12,334 21871 1
 1486 DEF 4 LAST 1182 12,334 11125 1
 1487 DEF 11 LAST 1182 12,334 16742 1

SR* RDSU
 O-RD,1
 01/32
 STEEL PIA

RIA=2-P(1+CCCA CCGA) (+6)

1488 DEF 5 LAST 1184 12,337 42741 0
 1489 12,337 45000 0
 1490 DEF 1 12,337 25422 1
 1491 DEF 2 LAST 1178 12,337 24767 1
 1492 12,337 77745 1

P
 ECV CALL
 HIGHENERGY
 GETX
 LUCAD

1493 DEF 1 LAST 1170 12,337 21871 0
 1494 DEF 1 12,337 16762 0
 1495 DEF 7 LAST 1182 12,337 00021 0
 1496 12,337 45014 0
 1497 DEF 4 LAST 1184 12,337 04310 1

T
 STEEL TPREV
 XI
 ECV CALL
 INFLUENC

HAVE EXCEEDED THEORETICAL BOUNDS

1498 DEF 3 LAST 1186 12,337 25427 1
 1499 DEF 1 LAST 1178 12,337 24421 0
 1500 12,337 44247 1
 1501 DEF 1 12,337 25447 1
 1502 DEF 4 LAST 1186 12,337 02671 1

NECP
 DELTIME
 RDSU
 BIGTIME
 TRESIPED

1503 DEF 1 12,337 22761 1
 1504 12,337 44246 1
 1505 DEF 3 LAST 1186 12,337 22740 0
 1506 12,337 47044 1
 1507 DEF 1 12,337 25516 1

STORE TEMPLAMB
 APS RDSU
 FFSILCAL
 BPL RTB

1508 DEF 2 LAST 1186 12,337 24644 1
 1509 12,337 43020 0
 1510 DEF 1 12,337 25460 1
 1511 DEF 3 LAST 1186 12,337 07714 0
 1512 DEF 1 12,337 25419 0

CHECKCTR
 RHIZ BCM
 SUFFCHK
 SLOPESW
 GCITEP

1513 12,337 45345 1
 1514 DEF 11 LAST 1187 12,337 00037 0
 1515 DEF 2 LAST 1187 12,337 02742 0
 1516 12,337 77654 1
 1517 DEF 2 LAST 1187 12,337 25461 1

LUCAD CSU
 T
 TPREV
 R7E

1518 DEF 1 12,337 25461 1
 1519 12,337 77624 1
 1520 DEF 1 12,337 25526 1
 1521 12,337 52145 1
 1522 DEF 727 LAST 1181 12,337 00155 0

SUFFCHK
 CALL ITERATCH
 LUCAD R7E
 MPAC
 SUFFCHK

1523 DEF 3 LAST 1187 12,337 25460 1
 1524 12,337 77615 1
 1525 DEF 8 LAST 1186 12,337 27661 1
 1526 DEF 9 LAST 1187 12,337 02766 1
 1527 12,337 77650 1
 1528 DEF 1 12,337 25420 0

LAC CCGA
 STORE CCGA
 COTO

1529 12,337 51145 1
 1530 DEF 1 12,337 00015 1
 1531 DEF 1 12,337 25452 1

NECP
 LUCAD FPI
 CCGA
 LOWENERGY

IMPOSSIBLE TRAJECTORY DUE TO INACCURATE
 BOUND CALCULATION. TRY NEW CCGA.

L COTIC SUBROUTINE

USER'S PAGE NO. 35 E5 S3

1564	REF	4	LAST 1188	12,3505	77517 1		CCGMAX	
1565				12,3505	43342 0		SQL	DATA
1566				12,3506	77526 1		STADR	
1567	REF	14	LAST 1188	12,3507	75011 1		STCRF	CCCA
1568	REF	4	LAST 1188	12,3511	15 1		STORE	CCCGA
1569				12,3511	77550 1		COTC	
1570	REF	13	LAST 1188	12,3512	2527 1			LABELCCF

PL AT 0

1574				12,3514	52145 0	LODIM	LODAD	GOTD
1575	REF	1		12,3514	11645 0			CCGLQDIM
1576	REF	1		12,3515	2522 1			MINCCGA

CCGLQDIM=-.945511597

1577				12,3516	60345 0	INITV	CLDAD	NORM
1578		12	LAST 1188	12,3517	60341 1			R1
1579		7	LAST 1188	12,3520	30047 1			X1
1580				12,3521	70525 1		FDRL	SF1
1581	REF	1	LAST 1187	12,3522	02740 0			D

PL AT 2

1582				12,3523	77571 1		CCV	
1583				12,3524	75457 0		SL*	SCRT
1584				12,3525	20175 0			D -4,1
1585				12,3526	72435 0		END	SL1
1586	REF	2	LAST 1176	12,3527	0121 1			PCCTMU

PL AT 0

1587				12,3528	41206 0		PUSH	DVP
1588	REF	14	LAST 1185	12,3531	02766 1			CCCA
1589				12,3532	74261 1		SL	VXSC
1590				12,3533	20216 1			F
1591	REF	7	LAST 1180	12,3534	02722 1			UR1

VD=VTAN (+7)

PL AT 2

1592				12,3535	77725 1		PDOL	
1593				12,3536	76561 1		VXSC	VS11
1594	REF	7	LAST 1180	12,3537	02674 0			UN
1595				12,3540	52225 0		VXV	VAL
1596	REF	7	LAST 1180	12,3541	02722 1			UR1

XCF WITH 70

PL AT 0,6

1597				12,3542	77772 0		VS11	
1598	REF	13	LAST 1170	12,3543	02744 1		STORE	VVEC
1599				12,3544	53135 0		SLLAR	PZE
1600	REF	5	LAST 1189	12,3545	02702 0			VTARGET
1601	REF	1		12,3546	05551 1			TARGETV

PL AT 0

1602				12,3547	77650 1		COTC	
1603	REF	7	LAST 1188	12,3548	02711 0			RTNLAMB

1604				12,3551	45145 1	TARGETV	ELCAD	CALL
1605	REF	6	LAST 1188	12,3552	02720 0			MACVFC2
1606		1		12,3553	24711 1			LAMENTER
1607	REF	4	LAST 1189	12,3554	02712 1		STORE	VTARGET
1608				12,3555	77650 1		COTC	

RTNLAMB

L CONIC (LUMINOUS)

USERS PAGE NO. 40

FF 53

1611			12,4567	4227	TIMERAD	STG	SETPR		PL AT 0
1612	OFF	1	12,4568	4228			STHTP		
1613			12,4569	4229			0		
1614			12,4570	4230					
1615	OFF	2	12,4571	4231		POV	+1		
1616			12,4572	4232			PRVL		PL AT 6
1617	OFF	14	12,4573	4233		VLFAE	PRVC		
1618			12,4574	4234			VVEC		
1619	OFF	14	12,4575	4235		CALL			
1620			12,4576	4236			PRV		PL AT 0
1621	OFF	5	12,4577	4237			PRV		
1622			12,4578	4238			PRV		
1623	OFF	12	12,4579	4239			PRV		
1624	OFF	11	12,4580	4240			PRV		
1625			12,4581	4241			PRV		
1626	OFF	16	12,4582	4242			PRV		
1627			12,4583	4243			PRV		
1628	OFF	8	12,4584	4244			PRV		
1629			12,4585	4245			PRV		
1630	OFF	4	12,4586	4246			PRV		
1631	OFF	13	12,4587	4247			PRV		
1632			12,4588	4248			PRV		
1633	OFF	10	12,4589	4249			PRV		
1634			12,4590	4250			PRV		
1635	OFF	1	12,4591	4251			PRV		
1636	OFF	2	12,4592	4252			PRV		
1637	OFF	12	12,4593	4253			PRV		
1638			12,4594	4254			PRV		
1639	OFF	17	12,4595	4255			PRV		
1640	OFF	12	12,4596	4256			PRV		
1641			12,4597	4257			PRV		
1642			12,4598	4258			PRV		
1643			12,4599	4259			PRV		
1644	OFF	2	12,4600	4260			PRV		
1645			12,4601	4261			PRV		
1646	OFF	1	12,4602	4262			PRV		
1647			12,4603	4263			PRV		
1648	OFF	1	12,4604	4264			PRV		
1649			12,4605	4265			PRV		
1650	OFF	4	12,4606	4266			PRV		
1651	OFF	2	12,4607	4267			PRV		
1652			12,4608	4268			PRV		
1653	OFF	1	12,4609	4269			PRV		

I CONIC SUBROUTINE

LSE-15 PAGE N. 41 F5 S2

1654			12, 164	7551 1	TEMPAVEC VASC	VSL1	
1655	DEF	1	12, 1641	7574 1		UN	
1656			12, 1642	75745 1	VXV	PDVL	VXCH WITH CD
1657			12, 1643	7574 1		VC	
1658			12, 1644	75741 1	VXSC	VAF	PL AT 0
1659	DEF	1	12, 1645	75741 1		COSF	
1660			12, 1646	41572 1	VSL1	PLCH	PL AT 6
1661			12, 1647	56241 1	DT	EDV	LIMITS RESULT TO POSMAX OR NEGMAX
1662	DEF	1	12, 1651	2722 1		HR1	
1663	DEF	1	12, 1651	25766 1		DF1/4	
1664			12, 1652	47142 1	SP1	BCV	SCALE BACK DOWN TO NORMAL
1665			12, 1653	25654 1		41	CLEAR OVERFLO IF SFT
1666	DEF	0	12, 1654	26732 0	STCVL	CSTH	CSTH (+1)
1667	DEF	11	12, 1655	27222 1		HR1	
1668			12, 1656	76435 1	VXV	VSL1	
1669			12, 1657	72441 1	DOT	SL1	
1670	DEF		12, 1658	26734 1		HR1	
1671	DEF	14	12, 1661	16730 1	STCOL	SATH	SATH (+1)
1672	DEF	13	12, 1662	27441 1		P	
1673			12, 1663	77624 1	CALL		
1674	DEF	3	12, 1664	24767 1		GTX	
1675			12, 1665	77614 1	CL CD		
1676	DEF	4	12, 1666	26734 1		SCLNSW	
1677	DEF	1	12, 1667	24747 1		CONVACT	
1678			12, 1667	43101 1	CIRCULAR SETPD	SETCL	
1679			12, 1671	22601 0		0	
1680	DEF	7	12, 1672	22434 0		SCLNSW	
1681	DEF	2	12, 1673	25752 1		ABTCONIC	
1682			12, 1674	75745 1	HAD 2	FLCAD	SIGN
1683	DEF	3	12, 1675	24115 1		LODPHALF	
1684	DEF	2	12, 1676	20031 0		COSF	
1685	DEF	4	12, 1677	14721 1	STCOL	COSF	
1686	DEF	3	12, 1678	24115 1		KFPZERO	
1687			12, 1679	77614 1	SFTCR		
1688	DEF	1	12, 1682	24115 1		APCSW	
1689	DEF	1	12, 1683	25641 1		TEMPAVEC	

L COWIC SUBROUTINES

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F5 S3

1670			12, 704	40000	APSIDES	STL	SPRIN		PL AT C
1671	REF	1	12, 704	12710			RTNAPS		
1672			12, 704	12710			00		
1673			12, 704	77000		POV			
1674			12, 704	25711			+1		
1675			12, 711	62075		VULAD	PDVL		PL AT C
1676	REF	1	12, 712	26550			VVIC		
1677	REF	15	12, 712	27441			VVIC		
1678			12, 714	77624		CALL			
1679	REF	2	12, 715	11000			PAFAM		
1680			12, 716	77600		POV			PL AT C
1681	REF	1	12, 717	77700			RTT, CC		
1682			12, 722	40000	GETECC	END	SL4		
1683	REF	14	12, 721	50742			SL4		
1684			12, 722	75021		POV	SQ T		
1685	REF	5	12, 722	11000			D1/64		
1686	REF	3	12, 724	12000		ST, 3F	POV		
1687			12, 724	60015		END	POV		PL AT 2
1688	REF	1	12, 724	11000			SL4		
1689	REF	10	12, 727	11000			SL4		
1690			12, 733	72000		END	SL4		
1691	REF	14	12, 731	12000			P		
1692			12, 730	77000		POV			PL AT 0
1693			12, 730	60000		POV			PL AT 2
1694	REF	15	12, 734	77000			REF (+25, +27)		
1695	REF	50	12, 735	12000			SL4		
1696			12, 736	53725		POV	SL4		PL AT 4
1697	REF	10	12, 737	12000			SL4		
1698			12, 740	20000			SL4		
1699			12, 741	40000		POV	SL4		PL AT 2,0
1700			12, 742	50000		POV	SL4		
1701	REF	1	12, 744	12000			INFINAPC		
1702	REF	2	12, 744	25747			INFINAPC		
1703			12, 745	77600		CCIC			
1704	REF	2	12, 747	12000			RTNAPS		
1705			12, 747	50000	INFINAPC	FL, 3F	RTNAPS		RETURNS WITH APCAPSIS IN APCAPSIS
1706	REF	1	12, 745	20000			LOFCSMAX		THAT FL IS AT 1.
1707	REF	3	12, 745	12000			RTNAPS		

L COTIC SUBROUTINE

LSP'S PAGE NO. 43 E5 S3

17136			12,7742	7777 1	AETRONIC EXIT	
17137	4	LAST	12,7754	C 5642 1	TC	PCDCC
17138			12,7754	20617 1	CCT	20617

1725	4	LAST	772	12,7717	LCPCSMAX EQUALS LCPCMAX	DEPCSMAX IN LOW MEMORY.
------	---	------	-----	---------	-------------------------	-------------------------

R1727 ERTABLE ASSIGNMENTS

R1728 KEELER SUBROUTINE

P1729 INPUT -

R1730	WPCCT	ERASE	+5
R1731	WPCCT	ERASE	+5
R1732	TALL	ERASE	+1
R1733	XKTP	ERASE	+1
R1734	TC	ERASE	+1
R1735	XPCFV	ERASE	+1

1736	2016	1/M	EQUALS	146
1737	2022	PCCTML	EQUALS	166
1738	2022	1/PCCTML	EQUALS	166

R1739 OUTPUT -

R1740	PCV	ERASE	+5
R1741	VVV	ERASE	+5
R1742	PC	ERASE	+1
R1743	XPCFV	ERASE	+1

P1744 DECHICS -

1745	1	ALPHA	EQUALS	80
1746	112	XMAX	EQUALS	100
1747	114	XMIN	EQUALS	120
1748	114	X	EQUALS	200
1749	1131	XI	EQUALS	240
1750	122	S(XI)	EQUALS	260
1751	114	XSCC(XI)	EQUALS	280
1752	116	T	EQUALS	300
1753	114	R1	EQUALS	320
1754	142	KPC01	EQUALS	340
1755	144	KPC02	EQUALS	360

P1756	ELIX	ERASE	+1
R1757	DELT	ERASE	+1
R1758	UNPCCT	ERASE	+5
R1759	PCNCRS	ERASE	+1
R1760	XPCFV	EQUALS	XKTP

R1761 LAMERT SUBROUTINE

R1762 INPUT -

R1763 RIVOC ERASE +5

L CCMIC SUPERINTEND

USER'S PAGE NO. 44 55 53

R1764 R2V C PHASE 45
 R1765 TESTING PHASE 41
 R1766 CFCMSEN PHASE 43
 R1767 GLESSW
 R1768 C C PHASE 41
 R1769 ACENSW
 R1770 UN PHASE 45
 R1771 VTARGET TAG PHASE 40
 R1772 TWFKIT EQUALS 40

1 IF GUESS AVAILABLE, 1 IF NOT
 INPUT ONLY IF GLESSW IS 200.
 IF UN TO BE COMPUTED, 1 IF UN INPUT
 ONLY USED IF ACENSW IS 1
 ONLY USED IF GUESSW IS 1

R1773 INPUT -
 R1774 VTARGET PHASE 45
 R1775 VIVC EQUALS 40

AVAILABLE ONLY IF VTARGET IS 200.

R1776 INPUT -
 R1777 TIME SE PHASE 41
 R1778 L2 PHASE 45
 R1779 MACV C PHASE 41
 R1780 L41 PHASE 45
 R1781 P1 EQUALS 200
 R1782 UP PHASE 45
 R1783 STH PHASE 41
 R1784 CSTH PHASE 41
 R1785 L-CSTH PHASE 41
 R1786 CSTH-RPH PHASE 41

1787
 1788
 1789

14
 14
 14

GUESSMAX EQUALS 14
 CFCMIN EQUALS 80
 CCECA EQUALS 120

CICREEPS 1/MU

R1790 TWFKIT EQUALS 400
 R1791 P PHASE 41
 R1792 CICA PHASE 41
 R1793 FIA PHASE 41
 R1794 Y EQUALS 200
 R1795 XSC EQUALS 200
 R1796 XI EQUALS 240
 R1797 S(XI) EQUALS 240
 R1798 XSC(XI) EQUALS 240
 R1799 T EQUALS 300
 R1800 KFC1 EQUALS 240
 R1801 KFC2 EQUALS 400
 R1802 SLCMSW
 R1803 SCLMSW
 R1804 CTRCPS -

R1805 PVEL EQUALS 200
 R1806 VVE PHASE 45
 R1807 CFCFLAG
 R1808 VVSW
 R1809 INFINFL
 R1810 AWC SW

L CONIC SURFACES

USER'S PAGE NO. 45 FF 53

R1911 36 W
 R1912 PTATT EQUALS PTALAM
 R1913 FCC FRASE +1
 R1914 FINT EQUALS PTALAM
 R1915 FINTSC EQUALS PTALAM
 R1916 P2 EQUALS MACVEG
 R1917
 R1918 ATNPM FRASE +0
 R1919 FOSPECT FRASE +0
 R1920 FSLV FRASE +1

R1921 ITERATED SUB-ROUTINE

R1922 DEF RSW
 1923 1
 1924 1
 R1925 INTC FRASE +1
 1926 14
 1927 126
 1928 136
 R1929 CLEND FRASE +1
 R1930 CLENDV FRASE +1
 1931 400
 TWPKIT EQUALS 400

R1932 MCR KEPLER

R1933 EPSILON FRASE +1

R1934 MME LAMBERT

R1935 TEEPLME EQUALS CLEND

R1936 TPELV EQUALS CLENDV

R1937 EPSILON EQUALS EPSIL +2 DOUBLE PRECISION WORK

L INTEGRATION INITIALIZATION

LSRPS PAGE NO. 1 FL 53

P0006 1.0 INTRODUCTION

P0007 -----

P0008 FROM A USER'S POINT OF VIEW, ORBITAL INTEGRATION IS ESSENTIALLY THE SAME AS THE 27E INTEGRATION
 P0009 PROGRAM. THE SAME INITIALIZATION TO THE PROGRAM WILL BE MAINTAINED, THE SAME STALLING ROUTINE WILL BE USED AND
 P0010 OUTPUT WILL STILL BE VIA THE BUSLIST. THE PRIMARY DIFFERENCES TO A USER INVOLVE THE ADDED CAPABILITY OF
 P0011 TERMINATING INTEGRATION AT A SPECIFIC FINAL RADIUS AND THE DIFFERENCE IN STATE VECTOR SCALING INSIDE AND OUT-
 P0012 SIDE THE LUNAR SPHERE OF INFLUENCE.

P0013 IN ORDER TO MAKE THE CSM(LUN)PREC AND CSM(LUN)CONIC ENTRANCES SIMILAR TO FLIGHT 27E, THE INTEGRATION PROGRAM
 P0014 WILL STOP TO SET THE FINAL RADIUS (FINAL) TO 0 SO THAT REACHING THE DESIRED TIME ONLY WILL TERMINATE
 P0015 THE INTEGRATION. THE DESIRED FINAL RADIUS MUST BE SET BY USERS OF INTEGRVS AND INTEGRV, AND MUST BE DONE AFTER THE
 P0016 CALL TO INSTALL.

P0017 WHEN THE INPUT OF THE LUNAR SURFACE (INDICATED BY LUNAR SURFACE FLAG SET) CALLS TO LEMCONIC, LEMPREC, AND
 P0018 INTEGRV WITH VINFLAC = 1, WILL RESULT IN THE USE OF THE PLANETARY INERTIAL ORIENTATION SUBROUTINES TO PROVIDE
 P0019 BOTH THE LUNAR POSITION AND VELOCITY IN THE REFERENCE COORDINATE SYSTEM.
 P0020 THE PROGRAM WILL PROVIDE OUTPUT AS IF INTEGRATION WAS USED. THAT IS, THE BUSLIST WILL BE SET AS NOTED BELOW AND
 P0021 THE PERMANENT STATE VECTOR WILL BE UPDATED WHEN SPECIFIED BY AN INTEGRV CALL.

P0022 USERS OF INTEGRVS DESIRING INTEGRATION (INTYPEID = 1) SHOULD NOTE THAT THE ORBITALNESS PERTURBATION COMPUTATION
 P0023 IN LUNAR ORBIT IS TIME EXPENSIVE. THEREFORE, THE USER SHOULD SUPPLY AN INITIAL STATE VECTOR VALID AT SOME REAL
 P0024 TIME AND THE DESIRED TIME (TIMEID) ALSO AT SOME REAL TIME. FOR CONIC INTEGRATION, THE USER MAY STILL USE ZERO
 P0025 AS THE INITIAL TIME AND DESIRED TIME AS THE DESIRED TIME.

2.0 GENERAL DESCRIPTION

P0026 THE INTEGRATION PROGRAM BEGINS AS A CLOSED INTERPRETIVE SUBROUTINE AND PERFORMS THESE FUNCTIONS---

- P0027 (1) INTEGRATES (PRECISION OR CONIC) EITHER CSM OR LM STATE VECTOR
- P0028 (2) INTEGRATES THE W-MATRIX
- P0029 (3) PERMANENT OR TEMPORARY UPDATE OF THE STATE VECTOR

P0030 THERE ARE SIX ENTRANCES TO THE INTEGRATION PROGRAM. FOUR OF THESE (CSMPREC, LEMPREC, CSMCONIC, LEMCONIC) SET
 P0031 ALL THE FLAGS REQUIRED FOR THE INTEGRATION PROGRAM ITSELF TO CAUSE THE PRECISION OR CONIC INTEGRATION (KEPLER) OF
 P0032 THE LM OR CSM STATE VECTOR, AS THE NAMES SUGGEST. ONE ENTRANCE (INTEGRVS) PERMITS THE CALLING PROGRAM TO
 P0033 PROVIDE A STATE VECTOR TO BE INTEGRATED. THE CALLING PROGRAM MUST SET THE FLAGS INDICATING (1) PRECISION OR
 P0034 CONIC INTEGRATION, (2) IN OR OUT OF LUNAR SPHERE, (3) MINOR USE OR NOT, AND THE INTEGRATION PROGRAM COMPLETES
 P0035 THE FLAG SETTING TO PROVIDE W-MATRIX INTEGRATION. THE LAST ENTRANCE (INTEGRV, USED IN GENERAL BY THE
 P0036 NAVIGATION PROGRAMS) PERMITS THE CALLER TO SET FIVE FLAGS (NOT MCCFLAC OR MINFLAC) BUT NOT TO INPUT A STATE
 P0037 VECTOR. ANY PROGRAM WHICH CALLS INTEGRVS OR INTEGRV MUST CALL INSTALL BEFORE IT SETS THE INTEGRATION FLAGS
 P0038 AND/OR STATE VECTOR.

P0039 THREE SETS OF 42 VECTOR WORDS AND 2 FLAGS ARE USED FOR THE STATE VECTORS. TWO SETS, WHICH MAY NOT BE OVERLAPED, ARE
 P0040 USED FOR THE PERMANENT STATE VECTORS FOR THE CSM AND LM. THE THIRD SET, WHICH MAY BE OVERLAPED WHEN INTEGRATION
 P0041 IS NOT BEING DONE, IS USED IN THE COMPUTATIONS.

P0042 THE PERMANENT STATE VECTOR WILL BE PERIODICALLY UPDATED SO THAT THE VECTORS WILL NOT BE CLOSER THAN 4 TIMESTEPS.
 P0043 THE PERMANENT STATE VECTOR WILL ALSO BE UPDATED WHENEVER THE W-MATRIX IS INTEGRATED OR WHEN A CALLER OF INTECV
 P0044 SETS STATEID (THE NAVIGATION PROGRAMS P20, P22.)

1 INTEGRATION INITIALIZATION

USER'S PAGE NO. 2 EQ S3

P0102 APPENDIX A OF THE USER'S GUIDE LISTS THE STATE VECTOR QUANTITIES.

P0103

P0104 2.1 RESTART

P0105

PHASE CHANGES WILL OCCUR IN THE INTEGRATION PROGRAM ONLY FOR THE INTEGRV ENTRANCE (I.E., WHEN THE W-MATRIX IS INITIALIZED OR PERMANENT STATE VECTOR IS UPDATED.) THE CPOLE NUMBER USED WILL BE THAT FOR THE P2C-25 PROGRAMS (I.E., CPOLE2) SINCE THE INTEGRV ENTRANCE WILL ONLY BE USED BY THESE PROGRAMS. IF A RESTART OCCURS DURING AN INITIALIZATION OF THE STATE VECTOR ONLY, THE RECOVERY WILL BE TO THE LAST PHASE IN THE CALLING PROGRAM. CALLING PROGRAMS WHICH USE THE INTEGRV OR INTEGRVS ENTRANCE OF INTEGRATION SHOULD ENSURE THAT IF PHASE CHANGING IS DONE THAT IT IS PRIOR TO SETTING THE INTEGRATION INFLS IN THE PUSHLIST.

P0107 THIS IS BECAUSE THE PUSHLIST IS LOST DURING A RESTART.

P0108

P0109

P0110

P0111

THE INTEGRATION ROUTINE WILL MAINTAIN THE PERMANENT MEMORY STATE VECTORS IN THE SCALING AND UNITS DEFINED IN APPENDIX A OF THE USER'S GUIDE. THE SCALING OF THE OUTPUT POSITION VECTOR DEPENDS ON THE ORIGIN OF THE COORDINATE SYSTEM AT THE INSIDE OF INITIALIZATION TIME. THE COORDINATE SYSTEM TRANSFORMATION WILL BE DONE AUTOMATICALLY ON MULTIPLE TIME-STEP ENDS OF INTEGRATION ONLY. THIS IT IS POSSIBLE TO HAVE OUTPUT FROM SUCCESSIVE INTEGRATIONS IN DIFFERENT SCALING.

P0113 HOWEVER, RALT, VALT WILL ALWAYS BE SCALED THE SAME.

P0114

P0115

P0116

P0117

P0118

P0119

P0120

P0121

P0122

P0123

P0124

P0125

P0126

P0127

P0128

P0129

P0130

P0131

P0132

P0133

P0134

P0135

P0136

P0137

P0138

P0139

P0140

P0141

P0142

P0143

P0144

P0145

P0146

P0147

P0148

P0149

P0150

EARTH MOON

25 27

RRECTOSM(LEM) - RECTIFIED POSITION VECTOR

METERS

2 2

VRECTOSM(LEM) - RECTIFIED VELOCITY VECTOR

M/CSEC

2 2

TRECTOSM(LEM) - TIME STATE VECTOR IS VALID

CSEC

2 2

CUSTOMARILY IS, BUT NOT LUNAR

ORBIT DEPENDENCE ON REAL TIME.

2 2

DELTAPOS(LEM) - POSITION DEVIATION

METERS

22 18

IF TRECTOSM(LEM) = 0

2 2

DELTAPOS(LEM) - VELOCITY DEVIATION

M/CSEC

2 -1

IF TRECTOSM(LEM) = 0

2 2

1 INTEGRATION INITIALIZATION

USER'S FACIL NO. 3 FC S3

R0144				29	27
R0145	VCVSM(LM)	= CMT POSITION	METERS	2	2
R0146		IF THIS OBJECTS (LEM) IF			
R0147		TCCSM(LEM) = 1			
R0148					
R0149				7	5
R0150	VCVSM(LM)	= CMT VELOCITY	M/CSEC	2	2
R0151		IF THIS OBJECTS (LEM) IF			
R0152		TCCSM(LEM) = 1			
R0153					
R0154				28	28
R0155	TCCSM(LM)	= TIME SINCE RECTIFICATION	SECS	2	2
R0156		CUSTOMERLY M			
R0157					
R0158				1/2	17
R0159	XKOTISA(LEM)	= X OF KOPINIS EQUATION	M	2	2
R0160		IF TCCSM(LM) = 1			
R0161					
R0162	CMDONFLC	= PLACEMENT FLAG CORRESPONDING			
R0163	LMIDFLAC	TO PLACFLAC AND MIDFLAC		0,1	0,1
R0164	LMONFLC	= 0, L = LM		0	0
R0165	LMIDFLC			0,1	0,1
R0166					
R0167	PLACFLAC	= PLACEMENT FLAG		0,1	0,1
R0168					

IN ADDITION, IF (LUMINARY) IS SET, THE INITIAL INPUT VALUES FOR LUMAR
 SOLAR EPHEMERIDES SUBROUTINE AND PLANETARY INERTIAL ORIENTATION SUB-
 ROUTINE MUST BE RESET.

R0173 OUTPUT

AFTER EVERY CALL TO INTEGRATION

				DEPTH	MCCN
R0174				29	29
R0175					
R0176					
R0177	00	DATA POSITION	METERS	2	2
R0178				7	7
R0179	00	DATA VELOCITY	M/CSEC	2	2
R0180				28	28
R0181	120	DATA TIME		2	2
R0182				28	27
R0183	140	DATA POSITION	METERS	2	2
R0184				7	5
R0185	00	DATA VELOCITY	M/CSEC	2	2
R0186				36	36
R0187	240	DATA MI	M/CSEC	2	2
R0188					
R0189	X1	MUTABLE MEMORY		-2	-100
R0190					
R0191	X2	LOCAL IN			
R0192	X2	COORDINATE SYSTEM ORIGIN		0	2
R0193		(THIS, NOT MCCN, SHOULD BE			

L INITIALIZATION

USE PAGE NO. 4 EC 53

R0104 USED TO SET INITIAL POSITION.)

R0105

R0106 IN ADDITION TO THE ABOVE, THE PRESENT STATE VECTOR IS UPDATED WHENEVER

R0107 STATEFC WAS SET AND WHEN VECTOR MATRIX IS TO BE INTEGRATED. THE PUSH

R0108 CALL IS SET TO 0 AND EVERY CALL IS CLEARED BEFORE RETURNING TO THE

R0109 CALLING PROGRAM.

R0200

R0201

R0202

R0203

R0204

R0205

R0206

R0207

R0208

R0209

R0210

R0211

R0212

R0213

R0214

R0215

R0216

R0217

R0218

R0219

R0220

R0221

R0222

R0223

R0224

R0225

R0226

R0227

R0228

R0229

R0230

R0231

R0232

R0233

R0234

R0235

R0236

R0237

R0238

R0239

R0240

R0241

R0242

R0243

4.0 CALLING SEQUENCES AND SAMPLE CODE

A) EXPLICIT INITIAL INTEGRATION. CONECONIC, LEMCONIC ENTRANCES

L-X STORE TIME TO STATE VECTOR (95 PLUS LSST (14531))

L CALL

L+1 (CONECONIC OR LEMCONIC)

L+2 RETURN

INPLT 28

TIME (IN PLT) TIME TO INTEGRATE TO...CENTISECONDS SCALED 2

OUTPLT

THE DATA LISTED IN SECTION 3.0 PLUS

RCVV POSITION VECTOR OF VEHICLE WITH RESPECT TO SECONDARY

BODY... METERS R-29 ONLY IF MIFLAG = TIMEFLAG = 1

B) CONIC INTEGRATION. CONECONIC, LEMCONIC ENTRANCES

L-X STORE TIME IN PUSH LIST (TIMEC1)

L CALL

L+1 (CONECONIC OR LEMCONIC)

INPLT/OUTPUT

SAME AS PRECISION INTEGRATION, EXCEPT RCVV NOT SET

C) INTEGRATE GIVEN STATE VECTOR. INTEGRVS ENTRANCE

CALL

INSTALL

VICAR

POSITION VECTOR

STEVE

RCV

STEVE

VELOCITY VECTOR

STEVE

MV

STEVE

FINAL RADIALS

STEVE

PHYSICAL

STEVE

SET(CLEAR) SET(CLEAR)

STEVE

INTEGRATE

STEVE

INTEGRVS

INPLT

RCV

POSITION VECTOR

METERS

VCV

VELOCITY VECTOR

M/SEC

IT

TIME TO STATE VECTOR (MAY = 1)

CONIC R-29

L INTEGRATION INITIALIZATION

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R1244      TREC1 TIME T INTEGRATE TO          CSFC E-28 (PF 320)
R1245      (MAY BE OVERWRITTEN IF TET=0)
R1246      OUTPUT
R1247      SAME AS FOR PRELIMINARY OR BASIC INTEGRATION,
R1248      DEPENDENT ON TYPELOC.
R1249      (1) INTEGRATE STATE VECTOR, STATE VECTOR ENTRANCE
R1250      L-8      STOP TIME IN PUSH LIST (TREC1)(MAY BE DONE AFTER CALL TO INSTALL)
R1251      L-8      CALL
R1252      L-7
R1253      L-6      SET(CLEAR) SET(CLEAR)
R1254      L-5      VINTFLAG 1=CSM, 0=LM
R1255      L-4      INTYPELOC 1=0, 1=1, 2=2, 3=3, 4=4, 5=5, 6=6, 7=7, 8=8, 9=9, 10=10, 11=11, 12=12, 13=13, 14=14, 15=15, 16=16, 17=17, 18=18, 19=19, 20=20, 21=21, 22=22, 23=23, 24=24, 25=25, 26=26, 27=27, 28=28, 29=29, 30=30, 31=31, 32=32, 33=33, 34=34, 35=35, 36=36, 37=37, 38=38, 39=39, 40=40, 41=41, 42=42, 43=43, 44=44, 45=45, 46=46, 47=47, 48=48, 49=49, 50=50, 51=51, 52=52, 53=53, 54=54, 55=55, 56=56, 57=57, 58=58, 59=59, 60=60, 61=61, 62=62, 63=63, 64=64, 65=65, 66=66, 67=67, 68=68, 69=69, 70=70, 71=71, 72=72, 73=73, 74=74, 75=75, 76=76, 77=77, 78=78, 79=79, 80=80, 81=81, 82=82, 83=83, 84=84, 85=85, 86=86, 87=87, 88=88, 89=89, 90=90, 91=91, 92=92, 93=93, 94=94, 95=95, 96=96, 97=97, 98=98, 99=99, 100=100, 101=101, 102=102, 103=103, 104=104, 105=105, 106=106, 107=107, 108=108, 109=109, 110=110, 111=111, 112=112, 113=113, 114=114, 115=115, 116=116, 117=117, 118=118, 119=119, 120=120, 121=121, 122=122, 123=123, 124=124, 125=125, 126=126, 127=127, 128=128, 129=129, 130=130, 131=131, 132=132, 133=133, 134=134, 135=135, 136=136, 137=137, 138=138, 139=139, 140=140, 141=141, 142=142, 143=143, 144=144, 145=145, 146=146, 147=147, 148=148, 149=149, 150=150, 151=151, 152=152, 153=153, 154=154, 155=155, 156=156, 157=157, 158=158, 159=159, 160=160, 161=161, 162=162, 163=163, 164=164, 165=165, 166=166, 167=167, 168=168, 169=169, 170=170, 171=171, 172=172, 173=173, 174=174, 175=175, 176=176, 177=177, 178=178, 179=179, 180=180, 181=181, 182=182, 183=183, 184=184, 185=185, 186=186, 187=187, 188=188, 189=189, 190=190, 191=191, 192=192, 193=193, 194=194, 195=195, 196=196, 197=197, 198=198, 199=199, 200=200, 201=201, 202=202, 203=203, 204=204, 205=205, 206=206, 207=207, 208=208, 209=209, 210=210, 211=211, 212=212, 213=213, 214=214, 215=215, 216=216, 217=217, 218=218, 219=219, 220=220, 221=221, 222=222, 223=223, 224=224, 225=225, 226=226, 227=227, 228=228, 229=229, 230=230, 231=231, 232=232, 233=233, 234=234, 235=235, 236=236, 237=237, 238=238, 239=239, 240=240, 241=241, 242=242, 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R1249      INPUT
R1250      TREC1 (PF 320) TIME T INTEGRATE TO          CSFC E-28
R1251      OUTPUT
R1252      SAME AS FOR PRELIMINARY OR BASIC INTEGRATION
R1253      THE PROGRAM WILL NOT RECALCULATE, RECALCULATE DEPENDENT ON
R1254      THE PROGRAM STATE VECTOR REPRESENTATION.

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R2906
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2. INITIALIZATION, INITIALIZATION

USEFUL PAGE NO. 6 F3 S3

1323				13,2621	77544 1		CALL	
1324	RFF	2	LAST	1145	27412 1			INTSTALL
1325				13,2622	45314 1		SET	CALL
13251	RFF	4	LAST	227	01176 1			ACCCFLAG
1326	RFF	7	LAST	577	26645 1			SETIFLGS
1327				13,2626	57014 1		SET	GTIO
1328	RFF	2	LAST	227	01147 1			PRCHFLAG
13282	RFF	1			25225 1			STATELP
1329				13,2631	07031 1	6015FCS	20FC	67100
1330				13,2632	25140 1			
134				13,2633	77414 1			
1345	RFF	4	LAST	557	01672 1			STATFLG
1346	RFF	136	LAST	1277	05353 1		TC	PHASCHNG
1347				13,2636	20332 1		OCT	20032
1348				13,2637	07061 1		EXTEND	
1349	RFF	2	LAST	235	02642 1		6015FCS	
1350	RFF	4	LAST	776	05277 1		TC	LCICALL
1351	RFF	4	LAST	258	01126 1		FRANK=	REFCTHIS
1352	RFF	2	LAST	240	02634 1		20ADP	STATEINT
1353				13,2643	26163 1			
1354	RFF	143	LAST	967	05155 1		TC	ENDOFFJOB
1355				13,2645	43114 1	SETIFLGS	SET	CLEAR
1356	RFF	5	LAST	1271	01672 1			STATFLG
1357	RFF	15	LAST	780	01573 1			INTYPELG
1358				13,2651	43114 1		CLEAR	CLEAR
1359	RFF	14	LAST	656	01676 1			DIAFLAG
1360	RFF	3	LAST	587	01675 1			DEORSLG
1361				13,2652	77216 1		SVG	
1362				13,2654	77776 1	INT	EXT	
1363	RFF	17	LAST	1271	05353 1		TC	PHASCHNG
1364				13,2656	07002 1		OCT	07002
1365	RFF	97	LAST	572	05516 1		TC	DOWNFLAG
1366	RFF	2	LAST	1200	00221 1		ADRES	QUITFLAG
1367	RFF	144	LAST	1271	05155 1		TC	ENDOFFJOB

R0411 ATOPCSM TRANSFERS PRECT TO PRECT +41 TO PRECTCSM TO PRECTCSM +41

R0432 CALLING SEQUENCE

R 14 L CALL

RC434 L+I ATCP(CSV

P 141. NIPAL XIT AT 142

0430				13,2662	47121 7	ATPCPSM	STQ	RTH
1437	REF	77	LAST 1181	13,2662	31151 0			S2
1438	REF	7	LAST 1149	13,2664	26675 1			MFV ECLSM
0430				13,2665	45014 7			CALL
1443	REF	7	LAST 711	13,2666	14562 0		SFT	CARONFLC
1441	REF	3	LAST 1149	13,2667	25114 1			SVOWN1

L INITIATION INITIALIZATION

LSE-15 PAGE NO. 7

F3 S3

0442				13,267	43,14 1	BCA	CLRG	
0443	REF	14	LAST	761	13,267		MCNFLAG	
0444	REF	20	LAST	1201	13,267	00 51	S2	
0445	REF	1	LAST	1201	13,267	4423	CMCFLC	
0446	REF	2	LAST	1202	13,267	00 51	S2	
0447	REF	1			13,267	00 51	SETBANK	
0448	REF	2	LAST	111	13,267	55,50 1	DIFFCNT	INITIALIZE INDEX
0449	REF	3	LAST	1202	13,267	51,50 1	INDEX	DIFFCNT
0450	REF	4	LAST	116	13,267	3 15 2 1	CA	RECT
0451	REF	4	LAST	12 2	13,267	51,50 1	INDEX	DIFFCNT
0452	REF	5	LAST	120	13,267	55,50 4	TS	RECTCSM
0453	REF	5	LAST	1202	13,267	11,50 1	CCS	DIFFCNT
0454	REF	5	LAST	1201	13,267	1 26,76 1	TCF	MOVFCSM +1
0455	REF	56	LAST	1175	13,267	1 26,76 1	TC	TRANSIC

IS TRANSFER COMPLETE
NO-LECP
COMPLETE- RETURN

R0455 PTCSCM TRANSFERES RECTCSM TO RECTCSM +41 TO RECT TO RECT +41

R0457 CALLING SEQUENCE

R0458 L CALL
R0459 PTCSCM

R0460 NORMAL EXIT AT L+2

0461				13,270	43,14 1	PTCSCM	KTR	RCN
0462	REF	9	LAST	1149	13,270	26,724 1	MOVFCSM	RCN
0463	REF	9	LAST	1202	13,271	4423 1	CMCFLC	
0464	REF	1			13,271	26,717 1	SETMCN	
0465					13,271	66,214 1	CLMFCN	CLAR
0466	REF	15	LAST	1202	13,271	00,762 1	MCNFLAG	
0467	REF	5	LAST	1149	13,271	00,762 1	PRDY	
0468					13,271	00,762 1		
0469					13,271	77,616 1	PVQ	
0470					13,271	66,214 1	SETMCN	SFT
0471	REF	16	LAST	1 02	13,272	00,62 1	SSP	
0472	REF	16	LAST	1002	13,272	00,62 1	MCNFLAG	
0473					13,272	00,62 1	PRDY	
0474					13,272	00,62 1		
0475	REF	3	LAST	1201	13,272	1 4,137 1	MOVFCSM	TC
0476	REF	6	LAST	1202	13,272	55,50 1	TS	DIFFCNT
0477	REF	7	LAST	1202	13,272	51,50 1	INDEX	DIFFCNT
0478	REF	10	LAST	1202	13,272	3 15,54 1	CA	RECTCSM
0479	REF	1	LAST	1202	13,272	51,50 1	INDEX	DIFFCNT
0480	REF	7	LAST	1202	13,272	51,50 1	TS	RECT
0481	REF	5	LAST	1202	13,272	11,50 1	CCS	DIFFCNT
0482	REF	3	LAST	1202	13,272	1 27,75 1	TCF	MOVFCSM +1
0483	REF	57	LAST	1202	13,272	1 27,75 1	TC	TRANSIC

R0484 TRANSFERES RECTCSM TO RECTCSM +41 TO RECTCSM TO RECTCSM +41

1 INTEGRATION INITIALIZATION

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0486				13,273	4703	1	ATCPLM	STQ	RTH
0487	REF	2	LAST 1202	13,273	0751	0			S2
0488	REF	2	LAST 1148	13,273	2751	1			MOVEALEM
0489				13,274	4314	0		SIT	CALL
0490	REF	2	LAST 1148	13,274	4314	1			LMCONFLG
0491	REF	2	LAST 1148	13,274	2671	1			SVOWN2
0492				13,274	4314	0		PCN	CLRG
0493	REF	17	LAST 1202	13,274	0751	1			LMCONFLG
0494	REF	21	LAST 1203	13,274	0751	1			S2
0495	REF	4	LAST 1202	13,274	0424	1			LMCONFLG
0496	REF	32	LAST 1202	13,274	0751	0			S2
0497	REF	3	LAST 1202	13,275	0337	0	MOVEALEM	TC	SETRANK
0498	REF	1	LAST 1202	13,275	5515	1		TS	DIFECNT
0499	REF	11	LAST 1203	13,275	5115	0		INDEX	DIFECNT
0500	REF	8	LAST 1202	13,275	3152	1		CA	PRFCT
0501	REF	12	LAST 1203	13,275	5115	0		INDEX	DIFECNT
0502	REF	2	LAST 1112	13,275	5515	0		TS	PRFCTLEM
0503	REF	12	LAST 1202	13,275	1115	1		CCS	DIFECNT
0504	REF	4	LAST 1202	13,275	1275	1		TCF	MOVEALEM +1
0505	REF	58	LAST 1202	13,276	0614	0		TC	DANZIG

R0516 REFLEM TRANSFERS PRFCTLEM TO PRFCTLEM +41 TO PRFCT TO PRFCT +41

0506				13,276	4704	1	PTCALEM	PCN	RTP
0507	REF	16	LAST 1202	13,276	0431	1			SLEFLAG
0508	REF	1		13,276	2752	0			USEPLOS
0509	REF	2	LAST 1148	13,276	2671	1			MOVEALEM
0510				13,276	5214	0		PCN	GTC
0511	REF	5	LAST 1203	13,276	4314	1			LMCONFLG
0512	REF	2	LAST 1202	13,276	2671	1			SETRANK
0513	REF	1		13,277	2671	1			CLMCON
0514	REF	4	LAST 1203	13,277	0337	0	MOVEALEM	TC	SETRANK
0515	REF	14	LAST 1203	13,277	5515	1		TS	DIFECNT
0516	REF	15	LAST 1203	13,277	5115	0		INDEX	DIFECNT
0517	REF	3	LAST 1203	13,277	3162	1		CA	PRFCTLEM
0518	REF	16	LAST 1203	13,277	5115	0		INDEX	DIFECNT
0519	REF	9	LAST 1203	13,277	5515	0		TS	PRFCT
0520	REF	17	LAST 1203	13,277	1115	1		CCS	DIFECNT
0521	REF	2	LAST 1202	13,277	1277	0		TCF	MOVEALEM +1
0522	REF	55	LAST 1203	13,278	0614	0		TC	DANZIG

0523				13,278	7721	1	USEPLOS	SETPD	VICAD
0524				13,278	0011	0			0
0525	REF	14	LAST 1131	13,278	0202	1			PIS
0526				13,278	4152	0		FILE	PLCH
0527	REF	51	LAST 1200	13,278	0641	1			TOTCL
0528	REF	12	LAST 790	13,278	1517	0		STEEL	TET
0529	REF	1		13,278	2725	0			S/P

1 INTEGRATION INITIALIZATION

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0501				13,311	7724 1	CALL		
0531	REF	7	LAST 1107	13,312	55716 1		RF-TC-F	
0532	REF	16	LAST 117	13,313	25535 1	STOVL	PCV	
0533	REF	7	LAST 127	13,314	24011 1		ZLMT	
0534				13,315	14011 1	STOVL	TD	
0535	REF	14	LAST 1213	13,316	01517 1		TET	
0536				13,317	14017 1	STOVL	6D	
0537	REF	0	LAST 1213	13,318	27735 1		5/R	
0538				13,319	45114 1	SET	CALL	NEEDED FOR SETTING XI ON EXIT
0539	REF	1	LAST 1202	13,320	0062 1		ACCF1AC	
0540	REF	1	LAST 1204	13,321	55716 1		AP-TC-F	
0541				13,322	74235 0	VXV	VXSC	
0542	REF	17	LAST 1214	13,323	01525 1		PCV	
0543	REF	1		13,324	26011 1		OMFGMOM	
0544	REF	14	LAST 1171	13,325	25543 1	STOVL	VGV	
0545	REF	0	LAST 1127	13,326	24017 1		ZLMT	
0546	REF	6	LAST 1148	13,327	01521 1	STOVL	TET	
0547				13,328	01714 1	AXT,2	SX,2	
0548				13,329	00002 1		2	
0549	REF	7	LAST 1207	13,330	02030 0		PCPY	
0550	REF	6	LAST 1148	13,331	25527 1	STOVL	TIV	
0551	REF	1		13,332	27150 1		A-PCFK	
0552	REF	1		13,333	32240 1	SETBANK	CAF	INTRANK
0553	REF	30	LAST 1121	13,334	54000 1		TS	BANK
0554	REF	1		13,335	33450 1	CAF	PCPYCAF	
0555	REF	327	LAST 1127	13,336	00002 1		TC	C
0556	REF	11	LAST 1202	13,337	00002 1		FRANK=	RRFCICSM
0557	REF	17	LAST 1251	13,338	26163 1	INTRANK	PCPY	INTRANK

R0558 SPECIAL PURPOSE ENTRY TO ORBITAL INTEGRATION. THESE ROUTINES PROVIDE ENTRANCES TO INTEGRATION WITH
 R0559 APPROPRIATE SWITCHES SET OR CLEARED FOR THE DESIRED INTEGRATION.

R0560 C-METHOD AND LEMPERC METHOD ORBIT INTEGRATION BY THE ENKE METHOD TO THE TIME INDICATED IN TDECI
 R0561 ACCELERATIONS (U TO 3-DIMENSIONAL ARE INCLUDED). NO W-MATRIX INT. IS DONE.

R0562 THE PERMANENT STATE VECTOR IS NOT UPDATED.

R0563 C-METHOD AND LEMPERC METHOD ORBIT INTEGR. BY KEPLER'S METHOD TO THE TIME INDICATED IN TDECI

R0564 AND DISILLING ACCELERATIONS ARE INCLUDED. IN THE PROGRAM FLOW THE GIVEN

R0565 STATE VECTOR IS USED TO OBTAIN A FIRST SOLUTION OF KEPLER'S EQUATION

R0566 THE ROUTINES ASSUME THAT THE GSM (LEP) STATE VECTOR IN P-M-M IS VALID.

R0567 SWITCHES SET PRIOR TO ENTRY TO THE MAIN INTEG. FROM ARE AS FOLLOWS

R0571 C-METHOD C-METHOD LEMPERC LEMPERC

R0572 VSTATEC SET SET CLEAR CLEAR

R0573 INTYPELG CLEAR SET CLEAR SET

R0574 C-METHOD CLEAR CLEAR CLEAR CLEAR

R0575 FAILING SIGNAGE

R0576 L-X STORE TIME

L INTEGRATION INITIALIZATION

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R0577 L CALL (STCALL T0FC1)
 R0578 L+1 CSMPREC (LSMCNIC, LEMPREC, LEMCNIC)
 R0579 NORMAL EXIT TO L+2

R0580 DIRECTING CALLER
 R0581 INTERCVI
 R0582 PRECUT FOR CSMPREC AND LEMPREC
 R0583 CONTROL FOR CSMCNIC AND LEMCNIC

R0584 OUTPUT - SEE PAGE 2 OF THIS LOG SECTION
 R0585 INPUT

R0586	T0FC1	TIME	TO	INT	TO	CSMCNIC	STQ	CALL
R0587						45120	1	CSMPREC
R0588	REF 4	LAST 1192	13,3044	00046	0			CALL
R0589	REF 29	LAST 1201	13,3046	27412	0			INTSTALL
R0590			13,3047	43130	1		SXA,1	SFT
R0591	REF 2	LAST 119	14,3050	02132	0			IRETURN
R0592	REF 19	LAST 655	13,3051	01474	1			VINTFLAG
R0593			13,3052	43134	0		IFLACP	SET
R0594	REF 3	LAST 237	13,3052	01467	0			CLEAR
R0595	REF 15	LAST 1201	13,3054	01676	1			PRECIFLG
R0596			13,3055	77614	1			DIM0FLAG
R0596.1	REF 16	LAST 1201	13,3056	01677	0		CLRG	INTYFFLG
R0596.2	REF 1		13,3057	27137	1			INTERCVI
R0597			13,3060	45120	1		LEMPREC	STQ
R0598	REF 61	LAST 1205	13,3061	00046	0			CALL
R0599	REF 30	LAST 1205	13,3062	27412	0			INTSTALL
R0600			13,3063	43130	1		SXA,1	CLRG
R0601	REF 3	LAST 1205	14,3064	02132	0			IRETURN
R0602	REF 20	LAST 1205	13,3065	01634	1			VINTFLAG
R0603	REF 1		14,3066	27052	0			IFLAG
R0604			13,3067	45120	1		CSMCNIC	STQ
R0605	REF 62	LAST 1205	13,3070	00046	0			CALL
R0606	REF 31	LAST 1205	13,3071	27412	0			INTSTALL
R0607			14,3072	43130	1		SXA,1	SFT
R0608	REF 4	LAST 1205	14,3073	02132	0			IRETURN
R0609	REF 21	LAST 1205	13,3074	01474	1			VINTFLAG
R0610			13,3075	43014	0		IFLAG	CLEAR
R0611	REF 16	LAST 1205	13,3076	01676	1			DIM0FLAG
R0612	REF 17	LAST 1205	14,3077	01433	1			INTYFFLG
R0613	REF 2	LAST 1205	13,3078	27137	1			INTERCVI
R0614			13,3079	45120	1		LEMCNIC	STQ
R0615	REF 43	LAST 1205	13,3082	00046	0			CALL
R0616	REF 42	LAST 1205	13,3083	27412	0			INTSTALL
R0617			14,3084	43130	1		SXA,1	CLRG

INITIALIZATION

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0618	REF	5	LAST 1205	13,315	02112 0		IFETLEN
0619	REF	22	LAST 1205	13,316	01634 1		VINTFLAG
0620	REF	1		13,317	27175 1		IFLAGC
0621				13,318	66214 0	INTERVS SET	SSP
0622	REF	4	LAST 1205	13,311	01467 0		PRECIFLG
0623	REF	5	LAST 1204	13,312	02031 1		PECCY
0624				13,313	00001 1		"
0625				13,314	66214 0	BOF	SSP
0626	REF	1	LAST 1204	13,315	0243 0		NECNFLAG
0627				13,316	27121 0		+3
0628	REF	6	LAST 1204	13,317	2711 1		PECCY
06281				13,318	00002 0		2
0629				13,319	77220 1	STQ	VLDATA
0630	REF	6	LAST 1204	13,320	02102 0		IFETLEN
0631	REF	4	LAST 1204	13,321	2407 0		750000
0632	REF	7	LAST 1204	13,322	01521 0	STORE	TOCLTAV
0633	REF	7	LAST 1204	13,323	35527 1	STCALL	TALV
0634	REF	2	LAST 1148	13,324	27673 1		RECTIFY
0635				13,325	43014 0	CLAP	SET
0636	REF	17	LAST 1205	13,326	01676 1		DIMFLAG
0637	REF	1		13,327	0402 1		NWIFLG
06371				13,328	77014 1	SETCC	
06372	REF	1		13,329	0402 1		NEWFLAG
0638	REF	1		13,330	27151 1		READED
0639	NOT ONLY INITIALLY TO INIT INTEGRATION WHICH PERMITS THE CALLER,						
0640	NORMALLY THE NAVIGATION PROGRAM, IT SET THE INTEG. FLAGS. THE ROUTINE						
0641	IS ENTERED AT INTERV.1 BY OSWELL ET AL. AND AT ALCATER BY INTERVS.						
0642	THE ROUTINE SETS UP A-ONLY IF ENTERED AT INTERV.1 AND SETS THE INTEG.						
0643	PROGRAM FOR PRECISION TO CONIC						
0644	THE CALLER MUST FIRST CALL INTSTLL TO CHECK IF INTEG. IS IN USE BEFORE						
0645	SETTING ANY FLAGS.						
0646	THE FLAGS WHICH SHOULD BE SET OR CLEARED ARE						
0647	VINTFLAG (LOCATED WHEN ENTERED FROM INTERVS)						
0648	INTERFLG						
0649	DIMFLAG						
0650	ISODDFLG						
0651	CALLING SEQUENCE						
0652	L-X CALL						
0653	L-Y INTSTALL						
0654	L-I SET OR CLEAR ALL THE FLAGS. ALSO CAN SET STATEFLG IF DESIRED						
0655	AND DIMFLAG IS CLEAR.						
0656	L CALL						
0657	L+1 INTEGRV						
0658	INITIALIZATION						
0659	FLAGS AS ABOVE						
0660	STORE TIME TO INTEGRATE TO INTRCE						
0661	OUTPUT						
0662	BATT AS						

L INITIATION INITIAL/ TIME

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E3 S3

P1663 VATT DEFINED
P1664 TAT

P1664

1665				13,3135	77420	INTERV	STC	
1666	REF	7	LAST 1216	13,3135	721 2 0			IR-TURN
1667				13,3137	43 14 0	INT CRV1	SFT	SET
1668	REF	2	LAST 1216	13,3140	1406 0 0			FFCFLAG
1669	REF	2	LAST 1206	13,3141	14762 1			NEWIFLG
1670				13,3142	77721 1	INTERV2	SSP	
1671	REF	13	LAST 1140	13,3142	77721 1			QPRET
1672	REF	2	LAST 1216	13,3144	27151 1			ALORFED
1673				13,3145	52 14 0		PCN	GETC
1674	REF	23	LAST 1216	13,3146	11714 1			VINTFLAG
1675	REF	1		13,3147	267 5 1			PTCACSM
1676	REF	2	LAST 298	13,3150	26761 1			PTCALEM
1677				13,3151	77745 1	ALORFED	ELDAD	
1678	REF	12	LAST 1142	13,3152	11041 1			TDFCL
1679	REF	2	LAST 114	13,3152	11115 0		STORE	TDFC
1680				13,3154	52 14 0		PLFF	GOTO
1681	REF	18	LAST 1216	13,3155	61753 0			INTYFFLG
1682	REF	1		13,3156	2724 0 0			TESTLCOP
1683	REF	1		13,3157	27244 0			PVCCN
1684				13,3160	77414 0	A-CHK	REF	EXIT
1685	REF	6	LAST 1201	13,3161	01752 0			STATEFLG
1686	REF	1		13,3162	27231 1			RECTCLT
1687	REF	108	LAST 1201	13,3163	15252 1		TC	PHASCHNG
1688				13,3164	14 122 0		GET	14122
1689	REF	60	LAST 1146	13,3165	155 4 0		TC	UFFLAG
1690	REF	3	LAST 1146	13,3166	15236 0		ADRES	REINTFLG
1692	REF	227	LAST 1201	13,3167	16042 1		TC	INTPRET
1693				13,3170	77721 1		SSP	
1694	REF	14	LAST 1207	13,3171	27153 1			QPRET
1695	REF	1		13,3172	27177 0			PREXIT
1696				13,3173	52 14 0		PCN	GETC
1697	REF	24	LAST 1207	13,3174	11714 1			VINTFLAG
1698	REF	3	LAST 497	13,3175	26662 1			ATPCCSM
1699	REF	2	LAST 37	13,3176	26735 1			ATOPLEM
1700				13,3177	77624 1	PREXIT	CALL	
1701	REF	20	LAST 1140	13,3178	11226 1			GFP2FC
1702				13,3201	45101 1	RECTOUT	SETPE	CALL
1703				13,3202	211 0 0			0
1704	REF	3	LAST 1206	13,3203	27672 0			RECTIFY
1705				13,3204	53775 1		VLOAD	VSL*
1706	REF	10	LAST 1213	13,3205	1502 0			PRECT
1707				13,3206	57576 1			M,2
1708				13,3207	53715 1		PCVL	VSL*
1709	REF	7	LAST 1171	13,3210	71511 0			VRECT
1710				13,3211	57576 1			M,2
1711				13,3212	62325 0	PCVL		PCVL

PHASE CHANGE HAS OCCURRED BETWEEN
INSTALL AND INTWAKE

VATT TO P16

VATT TO P16 TAT TO P12

L INTEGRATION INITIALIZE

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0712	REF	15	LAST 1204	13,3214	01517		TET
0713	REF	11	LAST 1207	13,3214	01517		WRECT
0714				13,3215	64716		PDVL
0715	REF	8	LAST 1207	13,3215	01511		WRECT
0716	REF	2	LAST 697	13,3217	5177		ML ARTH,2
0717				13,3220	76016		PUSH
0718				13,3221	77765		ECF
0719				13,3222	76014		BCN
0720	REF	20	LAST 1206	13,3224	01372		ACONFLAC
0721				13,3224	27276		+2
0722				13,3225	77776		-2
0723				13,3226	40111		INTEXIT
0724				13,3227	01011		SETPD
0725				13,3230	27231		W
0726				13,3231	43514		+1
0727	REF	2	LAST 1201	13,3232	04676		CLEAR
0728	REF	8	LAST 1200	13,3233	01667		WVINTCG
0729				13,3234	77614		PRCTFLG
0730	REF	7	LAST 1207	13,3235	01672		CLEAR
0731				13,3236	77545		ST/TFELG
0732	REF	9	LAST 1207	13,3237	02102		SLOAD
0733	REF	733	LAST 1187	13,3240	01154		EXIT
0734	REF	98	LAST 1175	13,3241	50120		TESTUN
0735	REF	15	LAST 1207	13,3242	54052		CA
0736	REF	4	LAST 1140	13,3243	013423		MEAC
0737	RVCON	SETS	LD ORBIT				INDEX
0738			INTEGRATION TO DO A CONIC SOLUTION FOR POSITION AND				FIXLOC
0739			VELOCITY FOR THE INTERVAL (TET-TD.C)				TS
0740							GCFFCT
0741							TC
0742							INTWAKE
0743	REF	2	LAST 1207	13,3244	45305		
0744	REF	7	LAST 1207	13,3245	01115		RVCON
0745	REF	14	LAST 1208	13,3246	01517		CLEAR
0746	REF	18	LAST 1160	13,3247	0674		DSU
0747	REF	4	LAST 1207	13,3250	27672		TDC
0748				13,3251	77024		TET
0749	REF	1		13,3252	22414		STCALL
0750				13,3253	42245		TAN.
0751	REF	8	LAST 1171	13,3254	01051		RECTIFY
0752	REF	17	LAST 1208	13,3255	01517		CALL
0753	REF	13	LAST 1208	13,3256	45517		KEPPREP
0754	REF	2	LAST 1207	13,3257	27011		DAI
							TC
							TET
							STCALL
							TET
							RECTIFY

ALLOW UPDATE OF DOWNLINK STATE VECTOR

1 INTEGRATION INITIALIZATION

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PC745F

TESTLOOP

0746			13,326	4214	TESTLOOP REF	CLPCC	
07462	REF	4	LAST 1201	13,326		QUITFLAG	
07463				27265		+	
07464	REF	8	LAST 1206	13,326		STATFLAG	
07465	REF	1		13,326		INTEXT	STCP INTEGRATION
07466				13,325	73311	+3	SETPC
0747				13,326	5013		ICD
0748	REF	1	LAST 1204	13,327	27233		PRDY
0749				13,327	51575		VICAD
0750	REF	1	LAST 1204	13,327	1525		RCV
0751				13,327	43136		PUSH
0752	REF	1		13,327	17262		CLAR
0753				13,327	5023		MIFLAG
0754	REF	1		13,327	53755		DSU*
0755				13,327	27231		BMM
0756				13,327	77614		PMS,2
0757	REF	7	LAST 1206	13,327	10162		+3
0758				13,327	41245		SET
0759				13,328	50133		NONFINAL CLCAD
0760				13,328	5042		DMP
0761				13,328	95762		ICD
0762	REF	2	LAST 1206	13,328	51770		340
0763				13,328	41266		SKIR
0764	REF	1		13,328	25762		OLV*
0765				13,328	40442		MUTAPTH,2
0766				13,328	54245		SGRT
0767	REF	730	LAST 1208	13,328	10155		DMP
0768				13,328	20220		.2C
0769				13,328	43136		SP3
0770	REF	1		13,328	27342		SR4
0771				13,328	50221		CL
0772	REF	1		13,328	27411		MPAC
0773	REF	2	LAST 1206	13,328	27342		15F
0774				13,328	45345		PUSH
0775	REF	4	LAST 1208	13,328	11115		RCV
0776	REF	19	LAST 1206	13,328	61517		MAXDT
0777				13,328	54234		BDSL
0778	REF	6	LAST 945	13,328	21413		BMM
0779				13,328	20211		DT/2MAX
0780	REF	2	LAST 115	13,327	02076		MAXDT
0781				13,327	51400		DEL
0782	REF	1		13,327	27246		TDLC
0783				13,327	51025		TST
0784				13,327	50115		SL
0785	REF	1		13,327	27352		SCNACDFE
0786				13,327	75345		PD
0787				13,327	02076		DT/2
0788	REF	3	LAST 1206	13,327	51400		AFS
				13,327	27246		CFIMAXDT
				13,327	51025		BMM
				13,327	50115		120
				13,327	27352		SCNCHK
				13,327	75345		ICN
				13,327	02076		120
				13,327	51400		DT/2

B-15

15 TIME TO INTEG. TO GP THAN MAXTIME

L INTEGRATION INITIALIZATION

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078	REF	4	LAST 12	13, 234	27376	STCALL	DT/2	
079	REF	2	LAST 12	13, 234	27376	PCHCHK	CLCAC	
0791				13, 234	65345	MAXDT	PDCL	EXCHANGE DT/2MAX WITH COMPUTED MAX.
0792	REF	2	LAST 12	13, 234	27411		DT/2MAX	
0793				13, 234	77651	COTD		
0794	REF	1		13, 234	27321		DT/2CCNF	
0795				13, 234	77734	CETMAXDT	RTB	
0796	REF	12	LAST 26	13, 234	21713		STCAMPAC	
0797	REF	5	LAST 1210	13, 234	27376	STCALL	DT/2	
0798	REF	1		13, 234	27376		LS(1MAX)	
0799				13, 234	61545	PCHCHK	CLCAC	
0800	REF	6	LAST 121	13, 234	27376		DT/2	
0801				13, 234	58325	CSI	RMN	
0802	REF	1		13, 234	27471		DT/2MIN	
0803	REF	2	LAST 1214	13, 234	27167		A-PCHK	
0804				13, 234	43141	FFFF	REF	NO BACKWARDS INTEGRATION WHEN IN FCC
0805	REF	3	LAST 1211	13, 234	17410		PCHFLAG	
0806	REF	1		13, 234	23211		TIMESTEP	
0807	REF	6	LAST 1216	13, 234	11717		PREIFLG	
0808	REF	5	LAST 1214	13, 234	23211		TIMESTEP	
0809				13, 234	45345	CLCAC	DSI	
0810	REF	7	LAST 121	13, 234	12751		DT/2	
0811				13, 234	10115		120	
0812				13, 234	43741	EMN	PCHCLR	
0813	REF	3	LAST 121	13, 234	27167		A-PCHK	
0814	REF	3	LAST 1217	13, 234	14742		PREIFLG	
0815	REF	3	LAST 1216	13, 234	23211		TIMESTEP	
0816				13, 234	45345	CLCAC	DSI	
0817	REF	5	LAST 121	13, 234	11115		TFT	
0818	REF	2	LAST 1215	13, 234	15170		TFT	
0819				13, 234	77541	RMN		NO BACKWARD INTEGRATION
0820	REF	7	LAST 1205	13, 234	27226		INTXIT	
0821				13, 234	45345	FDL	SR4	
0822	REF	3	LAST 111	13, 234	12771		DT/2	IS 4(DT) LS(TFEC - TF1)
0823				13, 234	44322	SR2	RSU	NO
0824				13, 234	52740	RMN	GTC	
0825	REF	4	LAST 121	13, 234	27226		INTXIT	
0826	REF	4	LAST 1214	13, 234	23211		TIMESTEP	
0827				13, 234	70342	DT/2 IN	2DEC	3 F-2C
0828				13, 234	14341	DT/2MAX	2DEC	4 F-2C P-20
0829				13, 234	14152			
0830				13, 234	14111			
0831	REF	1		13, 234	77776	INTSTALL	EXIT	
0832	REF	1		13, 234	27176	CA	BASELNG	
0833	REF	1		13, 234	73464	MASK	INTRITAB	IS THIS STALL AREA FREE
0834				13, 234	81076	EXTFAR		
0835	REF	1		13, 234	12451	BZF	CKTCGPAR	YES
0836	REF	1		13, 234	23463	CAF	WAKESTAL	
0837	REF	4	LAST 41	13, 234	65123	TC	JCHSLCFF	
0838				13, 234	77776	INTWAKE	EXIT	

L INT POSITION INITIAL17 TIME

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08345	REF	2	LAST	711	13,3422	1	2442	TCF	INTWAKE1	
084	REF	2	LAST	121	13,3423	4	115 1	INTWAKE	CS	PASFLAG
0841	REF	1			13,3424	7	4745 1	MASK	REINPTT	IS THIS INSTALLED ROUTINE TO FE
0842	REF	277	LAST	1122	13,3425	1		CCS	A	RESTAL FE
0843	REF	3	LAST	1211	13,3426	3	3443 1	TC	INTWAKE1	NO
0844	REF	59	LAST	1216	13,3427	50	124 1	INDEX	FIXLOC	
0845	REF	16	LAST	1218	13,3428	3	1452 0	CA	QPRET	
0846	REF	4	LAST	1251	13,3431	55	1254 0	TS	THAS12	YES, CONT RESTART WITH SOMEONE FLUSES G
0847	REF	100	LAST	1217	13,3432	2	5352 1	TC	PHASFLAG	
0848	REF				13,3433	14	122 0	CCT	04022	
0851	REF	6	LAST	1211	13,3434	2	1054 1	CA	TBASE2	
0852	REF	7	LAST	1211	13,3435	50	12 1	INDEX	FIXLOC	
0853	REF	17	LAST	1211	13,3436	54	122 1	TS	QPRET	
0854	REF	8	LAST	1211	13,3437	2	4745 0	CAF	REINPTT	
0855	REF	3	LAST	1211	13,3438	7	1116 1	MASK	RASFLAG	
0856	REF				13,3441	7	1136 1	EXTEND		
0857	REF	1			13,3442	1	2461 0	H7H	GCRAC	CONT INTWAKE IF WE CAME FINE VIA RESTART
0861	REF	2	LAST	1211	13,3443	3	3443 1	INTWAKE1	CAF	WAKESTAL
0862	REF				13,3444	0	004 0	INHINT		
0863	REF	5	LAST	467	13,3445	7	5117 1	TC	JCBWAKE	
0864	REF	22	LAST	1113	13,3446	1	364 1	CCS	LOCCTR	
0865	REF	4	LAST	1211	13,3447	1	2442 0	TCF	INTWAKE1	
0866	REF				13,3450	1	051 0	SCPTYDHE	CCF	41
0868	REF	2	LAST	1211	13,3451	4	2464 0	CS	INTPTAB	
0869	REF	4	LAST	1211	13,3452	7	1116 1	MASK	RASFLAG	
0870	REF	5	LAST	1211	13,3453	54	116 1	TS	RASFLAG	RELEASE STALL AREA
0871	REF				13,3454	0	012 1	REFINT		
0872	REF	2	LAST	1211	13,3455	1	3461 1	TCF	GCRAC	
0874	REF	2	LAST	1216	13,3456	3	4735 1	CKTCGRAC	CAF	INTPTAB
08745	REF				13,3457	0	004 0	INHINT		
0875	REF	6	LAST	1211	13,3460	26	1136 1	ACS	PASFLAG	
0876	REF	229	LAST	1217	13,3461	6	142 1	GCRAC	TC	INTPTAB
0877	REF				13,3462	77	616 0	RVQ		
0878	REF	33	LAST	1218	13,3463	27	413 1	WAKESTAL	CADR	INSTALL #1
0882	REF				13,3464	20	1 0 1	INTPTAB	CCT	20100

L INFORMATION INITIALIZATION

LSECT'S PAGE NO. 17 53 53

P0855 AUTOMATIC

R0896 THIS ROUTINE PERFORMS THE TRANSITION FROM A THRUSTING PHASE TO THE COAST
 R0897 PHASE BY INITIALIZING THE VEHICLE PERMANENT STATE VECTOR WITH THE
 R0898 VEHICLE LEFT BY THE PREVIOUS PHASE IN RN, VN, P1TIME.

R0899 BEFORE THIS IS DONE THE W-MATRIX, IF ITS VALID (PRWFLAG OR RENDWLOC IS
 R0900 SET) IS INTEGRATED FORWARD TO P1TIME WITH THE PRE-THRUST STATE VECTOR.

R0901 IN ADDITION, THE OTHER VEHICLE IS INTEGRATED (PERMANENT) TO P1TIME.

R0902 FINALLY TRKXCAT IS ZEROED

R0903	OFF	4	LAST 1200	13,3470		SETLOC INITIAT	
R0904				13,3475		RANK	
R0905	OFF	4	LAST 1200 TO	1212:	413 469*	CMAT#	81/INTIN
R0906				13,3469	43000 1	AUTOMATIC	STC
R0907	OFF	6	LAST 1149	13,3466	72772 1		PCN
R0908	OFF	11	LAST 836	13,3467	02716 0		RGRESS
R0909	OFF	1		13,3470	27524 0		RENDWLOC
R0910				13,3471	77614 1		INT/W
R0911	OFF	1		13,3472	01711 1	ON	PRWFLAG
R0912	OFF	2	LAST 1212	13,3472	27534 1		INT/W
							W-MATRIX VALID ,GC INTEGRATE IT
R0913				13,3474	45145 0	OTHERS	FLOAD
R0914	OFF	34	LAST 966	13,3475	01234 0		CALL
R0915	OFF	34	LAST 1211	13,3476	27412 0		P1TIME
R0916				13,3477	45014 0		INSTALL
R0917	OFF	25	LAST 1207	13,3478	01474 1	SET	CALL
R0918	OFF	1	LAST 1201	13,3479	25545 1		VINTFLAG
R0919	OFF	1	LAST 1207	13,3480	34341 0		SETFLOCS
R0920	OFF	11	LAST 1204	13,3481	27145 0	STCALL	TCFCL
							INT/CPV
R0921				13,3482	45174 1	AXT,2	CALL
R0922				13,3483	01002 0		2
R0923	OFF	25	LAST 1217	13,3484	27412 0		INSTALL
R0924	OFF	6	LAST 1148	13,3485	77014 1	PCN	AXT,2
R0925	OFF	6	LAST 1148	13,3486	04344 1		ACINTH-15
R0926				13,3487	27513 0		+2
R0927				13,3488	01011 1		0
R0928				13,3489	54775 1		
R0929	OFF	18	LAST 066	13,3490	01221 0	VLOAD	VS**
R0930				13,3491	57176 0		RN
R0931				13,3492	11533 0		1,2
R0932	OFF	12	LAST 1203	13,3493	11533 0	STORE	LOCCT
R0933	OFF	12	LAST 1203	13,3494	11533 0	STORE	RCV
R0934	OFF	25	LAST 1212	13,3495	11533 0		P1TIME
R0935	OFF	21	LAST 1218	13,3496	01517 0	STOVL	TFT
R0936	OFF	1	LAST 1274	13,3497	11533 0		VN

NOW MOVE PROPERLY SCALE RN, VN AS WELL AS
 P1TIME TO INTEGRATION FRASABLES.

L INTEGRATION INITIALIZATION

LSEFF'S PAGE NO. 18 E3 S3

0940				13,3533	45157 1	VSR#	GALI	
0941				13,3534	57176 1		0,2	
0942	RFF	3	LAST 711	13,3525	27777 1		MINIRECT	FINISH SETTING UP STATE VECTOR
0943				13,3526	66234 1	STA	SSP	
0944	RFF	1		13,3527	26757 1		ACVATHIS	PUT TEMP STATE VECTOR INTO PERMANENT
0945	RFF	11	LAST 121	13,3531	73462 1		TRKMKCNT	
0946				13,3531	60000 1		0	
0947				13,3532	77650 1	CCIC		
0948	RFF	2	LAST 1149	13,3533	47221 1		FAZABF	
0949				13,3534	45145 1	INT/W	CLCAC	CALL
0950	RFF	2	LAST 1212	13,3535	1234 1		PIPTIME	INTEGRATE W THRU EURN
0951	RFF	36	LAST 1212	13,3536	27412 1		INSTALL	
0952				13,3537	42014 1	SET	SPT	
0953	RFF	18	LAST 1212	13,3541	1476 1		DIMOFLEG	CC W-MATRIX
0954	RFF	2	LAST 1212	13,3541	4475 1		AVENICSW	SD WINT CLRBBFR RN,VN,PIPTIME
0955				13,3542	42014 1	SPT	CLEAR	
0956	RFF	0	LAST 1212	13,3543	11475 1		DEIRSEFLG	SXS FOR LM
0957	RFF	26	LAST 1212	13,3544	11674 1		VINTFLAG	LM
0958	RFF	56	LAST 1212	13,3545	24741 1	STCALL	TDEC1	
0959	RFF	12	LAST 1212	13,3546	27135 1		INTEGRV	
0960				13,3547	77650 1	CCIC		
0961	RFF	1		13,3551	27474 1		OTHERS	NOW CC OF THE OTHER VEHICLE

1 INTEGRATION INITIALIZATION

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3 53

P0568 MIDTCV1

P0569 THIS ROUTINE INTEGRATES (COMPUTES) TO THE TIME SPECIFIED IN TDEC1.
 P0570 IF, AT THE END OF AN INTEGRATION TIME STEP, CURRENT TIME PLUS A DELTA
 P0571 TIME (SET TIMEDEL...EVAL) ON THE COMPUTATION TIME FOR THE TIME STEP)
 P0572 IS GREATER THAN THE DESIRED TIME, ALARM 17.3 IS SET AND THE INTEGRATION
 P0573 IS DONE TO THE CURRENT TIME.
 P0574 RETURN IS IN BASIC TO THE RETURN ADDRESS PLUS ONE.

P0575 IF THE INTEGRATION IS FINISHED TO THE DESIRED TIME, RETURN IS IN BASIC
 P0576 TO THE RETURN ADDRESS.

P0577 IN EITHER CASE, BEFORE RETURNING, THE EXTRAPOLATED STATE VECTOR IS TRAN-
 P0578 SFERRED FROM R,V1 TO R,V I-PIPTIME1 IS SET TO THE FINISHING INTEGRA-
 P0579 TION TIME AND MPAC IS SET TO THE DELTA TIME---
 P0580 TIME MINUS CURRENT TIME.

P1001 MIDTCV2

P0992 THIS ROUTINE INTEGRATES THIS VEHICLE'S STATE VECTOR TO THE CURRENT TIME.
 P0993 NO INPUTS ARE REQUIRED OF THE CALLER. RETURN IS IN BASIC TO THE RETURN
 P0994 ADDRESS WITH THE ABOVE TIMEDELTA TO R,V1-PIPTIME1-AND MPAC DONE

P0995	REF	2	LAST 1214	13,3551	43221 I	MIDTCV2 STG	FRANK= IRETURN	
P0996				13,3551	43221 I		CLOGC	INTEGRATE TO PRESENT TIME PLUS TIMEDEL
P0997	REF	3	LAST 1214	13,3552	43224 I		IRETURN	
P0998	REF	1		12,3552	43224 I		MIDFLAG	
P0999	REF	1		13,3554	27572 I		ENTMID2	
P1000				13,3555	43221 I	MIDTCV1 STG	SET	INTEGRATE TO TDEC1
P1001	REF	4	LAST 1214	13,3556	43224 I		IRETURN	
P1002	REF	2	LAST 1214	13,3557	43224 I		MIDFLAG	
P1003				13,3557	43224 I		DATA	INITIAL CHECK, IS TDEC1 IN THE FUTURE
P1004	REF	12	LAST 1200	13,3561	21574 I		LEADTIME	
P1005	REF	1		13,3562	27572 I		TIMEDEL	
P1006				13,3563	51021 I	POSTL	REF	
P1007	REF	45	LAST 1213	13,3564	30741 I		TDEC1	
P1008	REF	1		12,3565	27574 I		ENTMID1	YES
P1009				13,3566	77524 I	CALL		
P1010	REF	1		13,3567	27566 I		NOTIME	NO, SET ALARM, SWITCH TO MIDTCV2
P1011				13,3567	43224 I	ENTMID2	DATA	
P1012	REF	25	LAST 1214	13,3571	21574 I		LEADTIME	
P1013	REF	2	LAST 1214	13,3572	27572 I		TIMEDEL	
P1014	REF	56	LAST 1214	13,3572	43224 I		STG	TDEC1
P1015				13,3574	77524 I	ENTMID1	CALL	
P1016	REF	27	LAST 1213	13,3575	27512 I		INSTALL	
P1017				13,3576	43224 I		CLEAR	CALL

L INTGRATION INITIALIZATION

LIST'S PAGE NO. 20 F7 S3

1008	REF	10	LAST	1213	13,3677	1576	1			TIMEFLAG	NO W-MATRIX
1009	REF	1			13,3678	26266	0			THISVINT	
1010					13,3671	44714	0		CLEAR	SFT	
1011	REF	10	LAST	1217	13,3672	11677	1			INTYPELG	
1012	REF	1			13,3673	14475	1			MIDAVFLG	LEFT INTEG. KNOW THE CALL IS FOR MICROAV.
1013					13,3674	77424	1		CALL		
1014	REF	13	LAST	1213	13,3675	27125	0			INTEGTV	GO INTEGRATE
1015					13,3676	77214	0		CLEAR	VLCD	
1016	REF	2	LAST	1215	13,3677	04675	1			MIDAVFLG	
1017	REF	2	LAST	548	13,3678	2551	0			FAIT	
1018	REF	7	LAST	874	13,3671	27545	0		STCVL	ONI	
1019	REF	2	LAST	547	13,3672	00127	0			VATT	
1020	REF	7	LAST	874	13,3673	17552	1		STCOL	VNI	
1021	REF	16	LAST	779	13,3674	00015	0			TAT	
1022	REF	11	LAST	886	13,3675	02561	0		STORE	PIPTIME1	
1023					13,3676	66134	1		SXA,2	SXA,1	
1024					13,3677	27777	1			ITX2	
1025					13,3678	27776	0			RTX1	
1026					13,3679	77776	1		EXIT		
1027					13,3680	10004	0		ININT		
1028					13,3681	27776	1		EXTEND		
1029	REF	40	LAST	984	13,3682	41025	1		CLS	TIME2	
1030	REF	74	LAST	1205	13,3683	27155	1		CLS	MPAC	
1031	REF	14	LAST	1049	13,3684	7762	1		TC	TPAGREE	
1032	REF	5	LAST	1214	13,3685	31744	1		CA	1PFTURN1	
1033	REF	15	LAST	885	13,3686	4666	1		TC	RANKJUMP	
1034					13,3687	47714	1	CRNIED	POF	RTI	
1035	REF	2	LAST	1214	13,3688	04754	0			MICIFLAG	
1036	REF	1			13,3689	27650	1			MID2	
1037	REF	24	LAST	1214	13,3690	21574	1			LOADTIME	
1038	REF	3	LAST	1214	13,3691	44215	1		GAC	HDSU	
1039	REF	6	LAST	1214	13,3692	27672	1			TIMEDELT	
1040	REF	6	LAST	1214	13,3693	11115	0			TIME	
1041	REF	2	LAST	1217	13,3694	4544	0		RPL	CALL	
1042	REF	2	LAST	1214	13,3695	27661	0			TESTLOOP	YES
1043	REF	2	LAST	1214	13,3696	27661	1			ACETIME	
1044					13,3697	42274	1	TIMEINC	STP	DAN	
1045	REF	35	LAST	1215	13,3698	21574	1			LOADTIME	
1046	REF	4	LAST	1215	13,3699	27672	1			TIMEDELT	
1047	REF	7	LAST	1215	13,3700	35115	1		STCALL	TIME	
1048	REF	2	LAST	1215	13,3701	27251	0			TESTLOOP	
1049					13,3702	45745	1	MID2	FLOAD	CSL	
1050	REF	8	LAST	1215	13,3703	11115	0			TIME	
1051	REF	22	LAST	1215	13,3704	01517	0			TTT	
1052					13,3705	45246	0		ARS	CSL	
1053	REF	1			13,3706	27671	0			BCSECS	

L INTEGRATION INITIALIZATION

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1090	REF	1		04,3174	11210 0	INTWAKFC		
1091				04,3175	43174 1	INTWAKEM AXI,2	SET	LUNAR SPPRRT OF INFLUENCE.
1092				04,3176	11320 0	DFC	2	
1093	REF	2	LAST 1216	04,3177	00042 1		MCNFLAG	
1094				04,3178	51135 1	INTWAKFC SLAC	BMI	COMMON CODING AFTER X2 INITIALIZED AND
1095								MCNFLAG SET (OR CLEAR). IS THIS A REQUEST FOR A LEM OR CSM
1096	REF	3	LAST 1216	04,3201	01502 1		UPSVFLAG	STATE VECTOR UPDATE.....
1097	REF	1		04,3202	11210 1		INTWAKLM	UPDATE CSM STATE VECTOR
1098				04,3203	77624 1	CALL		
1099	REF	4	LAST 1207	04,3204	26662 1		ATOPCSM	
1100				04,3205	52014 0	CLEAR	GETC	
1101	REF	2	LAST 1210	04,3206	01671 0		GRPWFLAG	
1102	REF	1		04,3207	11212 0		INTWAKEX	
1103				04,321	77624 1	INTWAKLM CALL		UPDATE L4 STATE VECTOR
1104	REF	3	LAST 1207	04,3211	26735 1		ATEPLEM	
1105				04,3212	77614 1	INTWAKEX CLEAR		
1106	REF	12	LAST 1212	04,3213	02676 1		RENDWFLC	
1107				04,3214	45131 0	INTWAKUP SSP	CALL	REMOVE :UPDATE STATE VECTOR INDICATOR:
1108	REF	7	LAST 1217	04,3215	15002 1		UPSVFLAG	
1109				04,3216	00000 1		0	
1110	REF	2	LAST 407	04,3217	27421 0		INTWAKFC	RELEASE :SWAP: OF ORBIT INTEG
1111				04,3220	77776 1	EXIT		
1112	REF	11	LAST 1211	04,3221	05253 1	TC	PHASCHNG	
1113				04,3222	04026 1	OCT	04026	
1114	REF	3	LAST 1216	04,3223	11666 1	TC	INTWAKUC	
1115				04,3224	00002 0	UPMSVSGD	OCT	2
1116				04,3225	00001 1		OCT	0
1117				04,3226	77420 1	GRP2FC	STC	EXIT
1118	REF	2	LAST 1207	04,3227	02711 1		GRP2SVQ	
1119	REF	111	LAST 1217	04,3230	05253 1	TC	PHASCHNG	
1120				04,3231	04022 0	OCT	04022	
1121	REF	231	LAST 1216	04,3232	06002 1	TC	INTPR T	
1122				04,3233	77650 1	OCT		
1123	REF	3	LAST 1217	04,3234	02711 1		GRP2SVQ	

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USER'S PAGE NO. 1 EC 53

L INITIAL INVESTIGATION

LSF'S PAGE NO. 2 EO 53

0051		11,245	20211 1	RC,1	
0052		11,246	20211 1	0,1	S(-FS(1-2FS)-1/0...)(+17 CR +16)
0053		11,246	55215 1	DAC	PDDL PL 6D
0054	REF 2 LAST 126	11,246	01553 1		
0055		11,246	53615 1	EMP	SL*
0056		11,246	77511 1		S(+17 CR +16)
0057		11,246	202 2 1		00
0058		11,246	43214 1		1,1
0059	REF 2 LAST 1148	11,247	57753 1	ECVR	DAC
0060		11,247	77626 1		TCDANZIG
0061	REF 2 LAST 1167	11,247	75647 1	STADR	
0062		11,247	74722 1	STERE	XKFPNEW
0063	REF 3 LAST 1171	11,247	02112 1	STQ	AXC,1
0064		11,247	31112 1		KEPRIN
0065		11,247	74114 1		17
0066	REF 23 LAST 1217	11,247	00313 1	BON	AXC,1
0067	REF 1	11,250	24123 1		WCONFLAG
0068		11,250	771 2 1	DFC	KCPLEFN
0069		11,250	77650 1	CCTC	2
0070	REF 2 LAST 1217	11,250	24123 1		KIFLEFN

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USER'S PAGE NO. 2 ED 53

0071				11,2514	66350 1	FFB3	LXA,1	SGP
0072	RFF	13	LAST 121F	11,2515	66351 0			DIFFQCAT
0073	RFF	21	LAST 121F	11,2516	66351 0			S1
0074				11,2517	77762 1		RFC	-13
0075				11,2518	54335 1		CLDAD	SG
0076	RFF	5	LAST 121C	11,2519	2076 1			RT/2
0077				11,2520	27612 0			GD
0078				11,2521	1511 0		TX,1	RRIND
0079				11,2524	27615 0			+1
0080				11,2525	43206 1		PUSH	GA
0081	RFF	8	LAST 121F	11,2526	1511 1			TC
0082	RFF	12	LAST 121F	11,2527	16174 1		STOOL	TOL.
0083				11,2528	77615 0		EAD	
0084	RFF	23	LAST 121F	11,2529	11517 1			TFT
0085	RFF	24	LAST 1220	11,2530	25517 1		STCALL	TFT
0086	RFF	2	LAST 121F	11,2531	22414 1			KFFPRCP

L CRITICAL INTERACTION

LSH'S PAGE NO. 4 FO 53

PAGE7 ACC RESULTING TO COMPLETE ACCELERATION COMPONENTS.

0000			11,254	7216	1	ACCOMP	LXA,1	LXA,2
0001	REF	1	LAST 11P	11,2545	7216			PPIDY
0002	REF	12	LAST 1221	11,2546	7216			PERCY
0003				11,2547	77775	1	VICAD	
0004	REF	10	LAST 1216	11,2548	24117			ZEROVEC
0005	REF	2	LAST 11P	11,2549	26662	1	STCVL	FV
0006	REF	23	LAST 110P	11,2550	12332	1		ALPHAV
0007				11,2551	53257	1	VSL*	VAF
0008				11,2552	57615			0 -7,2
0009	REF	1	LAST 11P	11,2553	71535	1		RCV
0010	REF	7	LAST 11P	11,2554	12041	1	STORE	BETAV
0011				11,2555	6514	1	REF	XCHX,2
0012	REF	2	LAST 121P	11,2556	1175	1		DIMIFLAG
0013				11,2557	22546	0		+5
0014	REF	19	LAST 1221	11,2558	115	1		DIFFCNT
0015	REF	8	LAST 11P	11,2559	12132	1	STORE	VECTAP,2
0016				11,2560	77724	0	XCHX,2	
0017	REF	20	LAST 1221	11,2561	115	1		DIFFCNT
0018				11,2562	53575	0	VICAD	UNIT
0019	REF	21	LAST 1221	11,2563	12172	1		ALPHAV
0020	REF	22	LAST 1221	11,2564	16132	1	STOOL	ALPHAV
0021				11,2565	10045	0		36D
0022	REF	4	LAST 112P	11,2566	36570		STCALL	ALPHAV
0023	REF	1		11,2567	22655	1		CAMCCMP
0024				11,2568	66175	1	VICAD	SX,1
0025	REF	3	LAST 1221	11,2569	12161	1		BETAV
0026	REF	22	LAST 1212	11,2570	1151	0		S2
0027	REF	23	LAST 1221	11,2571	16122	1	STOOL	ALPHAV
0028	REF	2	LAST 11P	11,2572	12172	0		BETAV
0029	REF	5	LAST 1221	11,2573	11270	1	STORE	ALPHAV
0030				11,2574	71214	0	REF	VICAD
0031	REF	2	LAST 120P	11,2575	12342	1		MICFLAG
0032	REF	1		11,2576	22126	1		RELATE
0033	REF	25	LAST 1221	11,2577	11517	0		TFT
0034				11,2578	77624	1	CALL	
0035	REF	3	LAST 977	11,2579	32647	1		LSPDS
0036				11,2580	72174	1	AXT,2	LXA,1
0037				11,2581	70032	0		2
0038	REF	34	LAST 1221	11,2582	70051	0		S2
0039				11,2583	77614	1	REF	
0040	REF	24	LAST 121P	11,2584	11234	0		MCCNFLAG
0041				11,2585	22611	1		+3
0042				11,2586	77176	0	VCCMP	AX,2
0043				11,2587	1151	1		1
0044	REF	4	LAST 1221	11,2588	12342	1	STORE	BETAV
0045	REF	3	LAST 11P	11,2589	26105	1	STOOL	PPCV
0046				11,2590	112	1		2D

L CRITICAL INFORMATION

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0135	REF	2	LAST	116	11,2605	2122	1
0136					11,2604	45335	0
0137	REF	19	LAST	116	11,2605	11511	0
0138	REF	1			11,2606	12774	1
0139					11,2607	42730	0
0140					11,2611	22613	0
0141	REF	21	LAST	1221	11,2611	11756	1
0142	REF	1			11,2612	22627	1
0143					11,2613	74275	0
0144	REF	24	LAST	1221	11,2614	12132	1
0145	REF	1	LAST	1221	11,2615	12171	1
0146					11,2616	52257	1
0147					11,2617	57175	0
0148	REF	5	LAST	1221	11,2620	12740	1
0149					11,2621	77724	0
0150	REF	21	LAST	1221	11,2621	11512	1
0151	REF	1	LAST	1221	11,2622	1214	1
0152	REF	7	LAST	116	11,2624	12114	1
0153					11,2625	77724	0
0154	REF	17	LAST	1222	11,2626	11407	0
0155					11,2627	62175	0
0156	REF	4	LAST	1221	11,2628	12115	1
0157					11,2629	76040	0
0158					11,2632	43114	1
0159	REF	3	LAST	127	11,2632	14200	1
0160	REF	25	LAST	1221	11,2634	11343	1
0161					11,2635	22642	1
0162					11,2636	52061	1
0163					11,2637	20612	0
0164	REF	2	LAST	1222	11,2640	12122	1
0165	REF	4	LAST	1222	11,2641	12122	1
0166					11,2642	77624	1
0167	REF	2	LAST	1221	11,2643	22655	1
0168					11,2644	2174	1
0169					11,2645	11040	1
0170					11,2646	11040	1
0171					11,2647	77775	1
0172	REF	5	LAST	1222	11,2650	12122	1
0173	REF	5	LAST	1222	11,2651	36040	0
0174					11,2652	22455	1
0175					11,2653	77650	1
0176	REF	1	LAST	1221	11,2654	23126	1
0177					11,2655	74575	0
0178	REF	7	LAST	1221	11,2656	12140	1
0179					11,2657	40236	1
0180					11,2658	20011	0
0181					11,2661	61511	1
0182					11,2662	20040	0
0183					11,2663	62235	0
0184	REF	1	LAST	1222	11,2664	12171	1

STORE	REFV
SLOAD	INSL
	MCLTFC
	CC127
PF17	REF
	+3
	DIMIFLAG
	GETRPSV
VLCAD	VXSC
	ALPHAV
	ALPHAV
VSC*	VSL
	1,2
	BETAV
XCHX,2	
	DIMICONT
STORE	VICTAP +6,2
STORE	RCVV
XCHX,2	
	DIMICONT
GETRPSV	VLCAD
	INCR,1
	RCVV
	4
CLEAR	REF
	RCFLAG
	MCMFLAG
	+5
VSC	VSL
	90
	RCVV
STORE	RPSV
CALL	
	GAMCONF
AXT,2	INCR,1
	4
	4
VLCAD	
	REFV
STCALL	BETAV
	GAMCONF
GETC	
	DIMIAT
GAMCONF	VLCAD
	VSL
	BETAV
VSC	SETPD
	1
FORM	PDPM
	310
FOOL	NO M
	ALPHAV

NORMED E SQUARED TO PD LIST
NORMALIZE (LESS ONE) LENGTH OF ALPHAV

L CRITICAL INTERRUPTION

LUNARY PAGE NO. 6 EQ 53

0106		11,266	77456 1	320	SAVING NORM SCALE FACTOR IN X1
0107	0	11,267	77457 1	PEVL	
0108	0	11,268	77458 1	BETAV	(PCL+2) = ALMOST NORMED ALPHA
0109	0	11,269	77459 1	UNIT	
0110	0	11,270	77460 1	STOCL	ALPHAV
0111	0	11,271	77461 1	360	
0112	0	11,272	77462 1	STORE	BETAV
0113	0	11,273	77463 1	FORM	ALPHV
0114	0	11,274	77464 1	330	FORM NORMALIZED QUOTIENT ALPHAV/BETAV
0115	0	11,275	77465 1	PEVL	
0116	0	11,276	77466 1	CLFAD*	(PEL+2) = ALMOST NORMALIZED FFC.
0117	0	11,277	77467 1	ASCAL,1	
0118	0	11,278	77468 1	STOCL	S1
0119	0	11,279	77469 1	XCHX,2	XAL,2
0120	0	11,280	77470 1	S1	
0121	0	11,281	77471 1	320	
0122	0	11,282	77472 1	CLFAD	
0123	0	11,283	77473 1	330	
0124	0	11,284	77474 1	20	
0125	0	11,285	77475 1	SP*	XCHX,2
0126	0	11,286	77476 1	0 -1,2	
0127	0	11,287	77477 1	S1	
0128	0	11,288	77478 1	PLSH	SRIF
0129	0	11,289	77479 1	PEVL	FC/4 TO 4L
0130	0	11,290	77480 1	DOT	
0131	0	11,291	77481 1	ALPHAV	
0132	0	11,292	77482 1	BETAV	
0133	0	11,293	77483 1	SLIR	PCSU
0134	0	11,294	77484 1	PLSH	CMFR
0135	0	11,295	77485 1	4	(PHD/4) = 2(ALPHAV/2.BETAV/2)
0136	0	11,296	77486 1	S11	TO FCL*
0137	0	11,297	77487 1	PLSH	RAD
0138	0	11,298	77488 1	QUARTER	
0139	0	11,299	77489 1	SQRT	
0140	0	11,300	77490 1	CMFR	PLSH
0141	0	11,301	77491 1	100	
0142	0	11,302	77492 1	020	
0143	0	11,303	77493 1	QUARTER	
0144	0	11,304	77494 1	PCOL	DAR
0145	0	11,305	77495 1	100	(1/4)+2((0+1)/4) TO PE+140
0146	0	11,306	77496 1	HOLFP	
0147	0	11,307	77497 1	CMFR	S11
0148	0	11,308	77498 1	00	
0149	0	11,309	77499 1	CMFR	PCV
0150	0	11,310	77500 1	THREE/8	
0151	0	11,311	77501 1	140	
0152	0	11,312	77502 1	CMFR	VXSC
0153	0	11,313	77503 1	6	
0154	0	11,314	77504 1	BETAV	
0155	0	11,315	77505 1	PEVL	VSP3
0156	0	11,316	77506 1	ALPHAV	(C/2)(C(PE+4))/2 TO PE+160

1 CRITICAL INFORMATION

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0230		11,2747	41455	VAC	FLAH	A12 + (CFC+160) TO PC+160
0246		11,275	41345	CLCAD	QVP	
0237		11,271	50011			
0238		11,273	41315		121	-
0231		11,273	61511	NORM	PCU	
0241		11,274	01127		310	
0241		11,275	41665	BDDV	QMP	
0242		11,2756	01131		2	
0243	EFF	6	11,2757	5177	0	MLFARTH,2
0244		11,2761	74275	DCMP	VXFC	
0245		11,2761	57154	XCFX,2	XAC,2	
0246	EFF	25	11,276		S1	
0247	EFF	35	11,2763		S2	
0248		11,2764	55164	XSL,2	XSL,2	
0249		11,2765	55166		310	
0250		11,276	07137		310	
0252		11,2767	5364	PCVR	VSL*	
0253	EFF	4	11,277	57753		TC+AMP2IG
0254		11,2771	57177		1-1,2	
0255		11,2772	52224	XCFX,2	VAC	
0256	EFF	26	11,2772		S1	
0257	EFF	2	11,2774	02	2	
0258	EFF	4	11,2775	2	62	
0259		11,277	43411	STOPP	EV	
0260		11,2771	2310	POV	RV	RETURN IF NO OVERFLOW
0261		11,2771	51775		+1	
0262	EFF	8	11,2781	01521	0	GRABBLE
0263		11,2782	77654		TDDELTA	
0264		11,2783	2312			
0265		11,2784	54445		INT-APT	
0266	EFF	2	11,2785	21	1	
0267		11,2786	27612		H	
0268		11,2787	44276	FLSH	RESU	
0269	EFF	2	11,2788	1551	1	TC
0270	EFF	12	11,2789	16774	0	STOOL
0271	EFF	12	11,2790	1517	0	TEST
0272		11,2791	45425	ESU	STADR	
0273	EFF	7	11,2792	4226	0	STCALL
0274	EFF	3	11,2793	22424	1	KEPPREP
0275		11,2794	77624	CALL		
0276	EFF	4	11,2795	27673	1	RECTIFY
0277		11,2796	77614	SETG		
0278	EFF	4	11,2797	14121	1	PECFLOW
0279	EFF	4	11,2798	2726	0	TESTFLOW
0280		11,2799	77776	INT-APT	EXIT	
0281	EFF	6	11,2800	5742	1	TC
0282		11,2801	21430	ECT	27430	

L ORBITAL INTERACTION

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P1287 THE DELTA ROUTINE COMPUTES THE ACCELERATION DUE TO DELATENESS. IT USES THE UNIT OF THE VEHICLE
 P1285 POSITION VECTOR FOUND IN ALPHAV AND THE DISTANCE TO THE CENTER IN ALPHAM. THIS IS ADDED TO THE SUM OF THE
 R1287 DISTURBING ACCELERATIONS IN EV AND THE PROPER CLIFF STAGE IS CALLED VIA X1.

1289			11,3026	71354 0	DELATE	LXA,2	DLCAC	
1290	REF	14	LAST 1221	11,3027	02030 0		PRODY	
1291	REF	8	LAST 1222	11,3031	02070 1		ALPHAM	
1292				11,3031	44601 0	SETPD	DSL*	
1293				11,3032	00001 0		0	
1294	REF	1		11,3033	50030 0		PCE,2	
1295				11,3034	43044 0	RPL	BCF	EET URPV
1296	REF	1		11,3035	23264 0		MBFANCH	
1297	REF	26	LAST 1222	11,3036	00343 0		MCCAFLEG	
1298	REF	1		11,3037	23273 0		CCSPH15	
1299				11,3040	65375 0	VLCAC	PDDL	
1300	REF	27	LAST 1222	11,3041	02032 1		ALPHAV	
1301	REF	29	LAST 1224	11,3042	01517 0		TET	
1302				11,3043	45125 0	PDDL	CALL	
1303	REF	1		11,3044	25756 1		3/5	
1304	REF	6	LAST 1125	11,3045	51677 0		R-TO-RP	
1305	REF	1		11,3046	24017 1	STCVL	URPV	PF/R E-1 IN PLANETARY COORDINATES
1306	REF	3	LAST 1204	11,3047	24001 0		ZUNIT	
1307				11,3050	45006 0	PUSH	CALL	ZUNIT E-1 IN PLANETARY CCCPD AT GCD
1308	REF	1		11,3051	23301 1		MATRIX	
1309				11,3052	77715 1	PDDL		LZ E-2 IN INERT CCCPD AT GCD
1310	REF	9	LAST 1128	11,3053	24005 1		XUNIT	
1311				11,3054	45006 0	PUSH	CALL	XUNIT E-1 IN PLANETARY CCORE. AT GCD
1312	REF	2	LAST 1225	11,3055	23301 1		MATRIX	
1313				11,3056	77772 0	VSL1		
1314				11,3057	24041 1	STCVL	320	LX E-1 IN INERT. CCCPD AT 320
1315				11,3060	77772 0	VSL1		
1316	REF	1		11,3061	14025 0	CCMTRM	STCCL	U2 E-1 IN INERTIAL CCORE AT 200
1317	REF	1		11,3062	00023 0		COSPH1/2	' Z-COMPONENT OF URPV
1318				11,3063	65275 1	CMPR	PDDL	P E-6 , 3COSPH1/64 AT GCD
1319	REF	1		11,3064	25770 0		3/32	2
1320	REF	2	LAST 1225	11,3065	00023 0		COSPH1/2	
1321				11,3066	57316 1	DSC	CMPR	
1322	REF	1		11,3067	25772 1		15/16	'
1323				11,3070	41425 1	CSU	PUSH	P E-5 , (1/2)(15CCSPH1 -3) AT GCD
1324	REF	1		11,3071	25764 0		3/64	3
1325				11,3072	41275 1	CMPR	DMP	
1326	REF	3	LAST 1225	11,3073	00023 0		CCSPH1/2	
1327	REF	1		11,3074	13764 0		7/12	
1328				11,3075	65372 1	SL1R	PDDL	
1329				11,3076	00001 0		00	
1330				11,3077	44275 1	CMPR	BDSU	
1331	REF	1		11,3100	13772 1		2/3	'
1332				11,3101	57206 1		CMPP	'
1333	REF	4	LAST 1225	11,3102	00023 0	PUSH	CCSPH1/2	P E-7, (1/3)(7CCSPH1 P -4P) AT GCD
1334				11,3103	65275 1	CMPR	PDDL	4 3 2
1335	REF	1		11,3104	13766 1		9/16	

L CREITAL INTEGRATION

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0336		11,3105	00003 1		20		
0337		11,3106	44275 1	DMPP	RDSL	P	E-10, (1/4) (COSPHI) P -5P)
0338	REF 1	11,3107	13770 0		5/128	5	4 3
0339		11,3110	56203 0	DMP*	DDV		
0340	REF 1	11,3111	51764 0		J4REFQ/J3,2	B-	(J RF/J R)P
0341	REF 9 LAST 1225	11,3112	02170 1		ALPHAM		4 3 5
0342		11,3113	56615 0	CAD	DMFR*		
0343		11,3114	00005 1		40		2 2 1
0344	REF 1	11,3115	51760 1		2J3RF/J2,2	R	(2J RP /J2 R)P +(2J RP /J2R)P
0345		11,3116	42271 1	DDV	DAD		4 5 3 4
0346	REF 10 LAST 1226	11,3117	02170 1		ALPHAM	-	2 2 2 1 1
0347		11,3120	00003 1		20	(R/R) (J RP P /R + 2J RP P / + J P)	
0348		11,3121	77761 1	VXSC			4 5 3 4 2 2 3
0349	REF 28 LAST 1225	11,3122	02132 1		ALPHAV		4 2 1 -
0350	REF 1	11,3123	14033 1	STEEL	TVFC	E-6, (SUM (J /R)P (COSPHI))LR)	
0351		11,3124	72403 1	DMP*	SP1	I=2 1 1+1	
0352	REF 2 LAST 1226	11,3125	51764 0		J4REFQ/J3,2		1
0353		11,3126	42271 1	DDV	DAD	(J RF/J R)P	
0354	REF 11 LAST 1226	11,3127	02170 1		ALPHAM		4 3 4
0355		11,3130	50473 1	DMFR*	SR3		2 2 1
0356	REF 2 LAST 1226	11,3131	51760 1		2J3RF/J2,2	(2J RP /J R)P +(2J RP /J R)P	
0357		11,3132	42271 1	DDV	DAD		4 2 4 3 2 3
0358	REF 12 LAST 1226	11,3133	02170 1		ALPHAM		
0359		11,3134	76561 1	VXSC	VSL1		4 1 -
0360	REF 2 LAST 1225	11,3135	00025 0		UZ	B-6 SUM (P(COSPHI))LZ	
0361		11,3136	77645 0	EVSL		I=2 1	
0362	REF 2 LAST 1226	11,3137	00033 1		TVFC		4 I=2 1 -
0363	REF 2 LAST 1226	11,3140	14033 1	STEEL	TVFC	SUM ((VL J (RP/R)) (P (COSPHI))LR -	
0364	REF 13 LAST 1226	11,3141	02070 1		ALPHAM	I=2 1 I+2	
0365		11,3142	63501 0	NORM	DSQ	P (COSPHI) (LZ)) E-6 AT 200	
0366	REF 65 LAST 1218	11,3143	00047 1		X1	1	
0367		11,3144	60216 0	DSQ	NCRM		
0368	REF 27 LAST 1224	11,3145	00051 0		S1		4
0369		11,3146	54616 0	PUSH	BCDV*	NORMALIZED R	AT 000
0370	REF 1	11,3147	51754 0		J2REFQSQ,2		
0371		11,3150	40161 0	VXSC	PCV		
0372	REF 4 LAST 1226	11,3151	00033 1		TVFC		
0373		11,3152	23153 1		+1	B+38 FOR EARTH , B+42 FOR MOON	
0374		11,3153	56070 0	XAD,1	XAD,1		
0375	REF 66 LAST 1226	11,3154	00046 0		X1		
0376	REF 67 LAST 1226	11,3155	00046 0		X1		
0377		11,3156	53670 0	XAD,1	VSL*		
0378	REF 28 LAST 1226	11,3157	00050 1		S1		
0379		11,3160	20153 1		O -22F, 1		
0380		11,3161	40055 0	VAD	BCV		
0381	REF 5 LAST 1224	11,3162	02162 1		FV		
0382	REF 1	11,3163	23000 0		GCPAGUE		
0383	REF 6 LAST 1226	11,3164	16062 1	STEEL	FV	E+16 FOR EARTH , B+20 FOR MOON	
0384	REF 2 LAST 1226	11,3165	00017 1		URPV	B-1 X-COMPONENT OF POSITION IN	
0385		11,3166	41414 0	BCF.	PUSH	PLANETARY COORD. AT 020	

L CAPITAL INTEGRATION

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0386	REF	27	LAST 1225	11,3167	77343 0	MOONFLAG			
0387	REF	2	LAST 1225	11,3170	23264 0	NERANCH			
0388				11,3171	65316 0	DSQ	PDDL	2	
0389	REF	3	LAST 1226	11,3172	07021 1		URPV +2	B-2 x	AT 04D
0390				11,3173	45316 1	DSQ	DSU	E-1 Y-COMPONENT	
0391				11,3174	74205 0	DSQ	VXSC		
0392	REF	3	LAST 1204	11,3175	27735 0	DSQ	5/8	2 2 -	
0393	REF	29	LAST 1226	11,3176	02032 1		ALPHAV	E-6 5(Y -X)UR	2 2 -
0394				11,3177	65332 0	VSL2	PDDL	E-3 5(Y -X)LR	AT 02D
0395				11,3200	53361 0	VXSC	VAD		
0396				11,3201	00041 1		32D	2 2 -	
0397				11,3202	47315 0	PDVL	VXV	(5(Y -X)LR/R) + (2X/R)LX	AT 02D
0398				11,3203	00041 1		32D	E-1 UX	
0399	REF	3	LAST 1226	11,3204	00025 0		UZ	E-2 -LY =(UX * LZ)	
0400	REF	4	LAST 1227	11,3206	00021 1	VSL1	VXSC	E-3 -(2Y/R)UY	
0401				11,3207	41455 0		URPV +2	2 2 -	
0402				11,3210	77745 1	VAD	PUSH	E-3 (5(X -Y)LR/R) + (2X/R)LX - (
0403				11,3211	00022 0	CLCAD		-	
0404	REF	5	LAST 1225	11,3212	41516 0		CCSPHI/2	2Y/R)UY	AT 02D
0405				11,3213	65205 0	DSQ	PUSH	E-2 (7,COMPONENT)	AT 08D
0406				11,3214	27735 0	DSQ	PDDL	2	
0407	REF	4	LAST 1227	11,3215	43302 1	DSQ	5/8	E-5 5CCSPHI/2	AT 08D
0408				11,3216	00011 1	SP2	CAF		
0409				11,3217	41221 0		QBD		
0410				11,3220	11025 0	BDSU	DMP	2	
0411	REF	6	LAST 1150	11,3221	00017 1		D1/32	E-5 (1 - 7CCSPHI)	
0412	REF	5	LAST 1227	11,3222	74205 0		URPV		
0413				11,3223	27735 0	DSQ	VXSC		
0414	REF	5	LAST 1227	11,3224	72032 1		5/8		
0415	REF	30	LAST 1227	11,3225	65272 0		ALPHAV	2 -	
0416				11,3226	74225 1	VSL5	PDDL	E-5 (5X/R)(1-7CCSPHI)LR	AT 0ED
0417				11,3227	11025 0	DSQ	VXSC		
0418	REF	7	LAST 1227	11,3230	00041 1		D1/32		
0419				11,3231	53372 1		32D		
0420				11,3232	41325 0	VSL1	VAD	2 -	
0421				11,3233	00017 1	PDVL	DMP	E-5 (5X/R)(1-7CCSPHI)LR + (5CCSPHI	
0422	REF	6	LAST 1227	11,3234	00023 0		URPV	-	
0423	REF	7	LAST 1227	11,3235	74205 0		URPV +4	-1)UX	AT 08D
0424				11,3236	27735 0	DSQ	VXSC		
0425	REF	6	LAST 1227	11,3237	00025 0		5/8	E-5 5X Y	
0426	REF	4	LAST 1227	11,3240	53352 0		UZ	M M	
0427				11,3241	65325 0	VSL2	VAD	2 -	
0428				11,3242	02070 1	PDVL	ACPM	E-5 (5X/R)(1-7CCSPHI)LR + (5CCSPHI	2
0429	REF	14	LAST 1226	11,3243	00050 1		ALPHAV	-	
0430	REF	28	LAST 1174	11,3244	67206 1		X2	2 -	
0431				11,3245	01351 1	PUSH	CLCAD	-1)UX + (1)X2/R)UZ	AT 0ED
0432	REF	1		11,3246	74271 1		E32C21RM		
0433				11,3247	63257 1	DSQ	VXSC		
0434				11,3250	57601 1	VSL*	PDVL		
0435							0 -3,2		

L CREDITAL INTEGRATION

USER'S PAGE NO. 11 EO S3

0436			11,3251	67216 I	PUSH	SLOAD	
0437	REF	1	11,3252	01350 C		E3J22R2M	
0438			11,3253	53361 0	VXSC	VAD	
0439			11,3254	70257 0	VSL*	V/SC	
0440			11,3255	20146 0		0 -270,1	E+16 OR E+20 (J + C)
0441			11,3256	40055 0	VAD	BCV	22 31
0442	REF	7	11,3257	02062 1		FV	
0443	REF	2	11,3260	23000 0		GCBAGLE	
0444	REF	8	11,3261	02062 1	STORE	FV	
0445			11,3262	77754 1	LXA,2		
0446	REF	15	11,3263	12030 0		PBCDY	
0447			11,3264	72135 0	NERANCH	SLOAD	
0448	REF	23	11,3265	01501 1		LXA,1	
0449	REF	741	11,3266	00154 1		DIFEGCNT	
0450			11,3267	73275 1	DNF	MPAC	
0451	REF	1	11,3270	27737 1		CECTC	
0452	REF	742	11,3271	00155 0		-1/12	
0453	REF	1	11,3272	22016 0		MPAC	
0454			11,3273	77745 1	COSPHIE	DIFEGTAB	
0455	REF	31	11,3274	02136 0	CLCAD		
0456	REF	6	11,3275	24023 0		ALPHAV +4	
0457	REF	4	11,3276	24001 0	STCVL	COSPHI/2	
0458			11,3277	77650 1		ZUNIT	
0459	REF	1	11,3310	23061 1		ECTC	
0460			11,3311	57435 1	MATRIX	CCNTEFM	
0461	REF	2	11,3312	72013 1	VXV	VCOMP	
0462			11,3313	77655 1		504LM	ROUTINE TRANSLATES FROM PLANETARY
0463			11,3314	43515 0	VAD		TO INERTIAL COORDINATES
0464	REF	8	11,3315	00025 0	VXM	RVO	
0465	REF	1	11,3316	23475 0		MATRIX	
0466	REF	1	11,3317	23511 1	DIFEGTAB	CADR	DIFEG+0
0467	REF	1	11,3318	23512 0		CADR	DIFEG+1
0468	REF	1	11,3319	77214 0		CADR	DIFEG+2
0469	REF	4	11,3312	02342 1	TIMESTEP	ROF	VLOAD
0470	REF	1	11,3313	23342 0			MICFLAG
0471	REF	23	11,3314	01535 0			RECTEST
0472	REF	17	11,3315	41241 0	DCI	RCV	
0473	REF	10	11,3316	01543 1		DMP	
0474	REF	2	11,3317	02076 1		VCV	
0475	REF	2	11,3318	77640 0	BMM	DT/2	(R.V) X (DELTA T)
0476	REF	2	11,3319	23342 0			
0477	REF	28	11,3320	43114 0	PCN	RECTEST	
0478	REF	1	11,3321	23417 1		RCF	
0479	REF	5	11,3322	00303 1		MCCNFLAG	
0480	REF	1	11,3323	23417 1		LUNSPH	
0481	REF	1	11,3324	04340 1		RFCLAG	
0482	REF	1	11,3325	23414 1		EARSFH	
0483	REF	29	11,3326	45145 0	ELCAD	CALL	
0484	REF	4	11,3327	01517 0		TCT	
0485	REF	4	11,3328	33647 1		LSPOS	RPQV IN MPAC
0486	REF	5	11,3329	02115 1	STORE	RCQV	RCQV

L CREDITAL INTEGRATION

USFR'S PAGE NO. 12 EC S3

0454			11,3333	77754 1	LXA,2		
0455	REF	16	LAST 1228	11,3334	12131 0	PBCDY	
0456				11,3335	51445 0	ABVAL	
0457	REF	24	LAST 1228	11,3336	01535 0	INLUNCHK BVSL	RCV
0458				11,2237	50125 0	DSL	BMA
0459	REF	1		11,3340	27743 1	RSPHERF	
0460	REF	1		11,3341	23434 7	DCSWITCH	
0461				11,3342	51575 1	RECTEST	RECTIFY IF
0462	REF	9	LAST 1274	11,3343	01521 0	VLCAD	ABVAL
0463				11,3344	77600 1		TDELTAV
0464	REF	1		11,3345	23370 1	PCV	
0465				11,3346	51025 1	DSU	CALLRECT
0466	REF	2	LAST 951	11,3347	13762 0		BPL
0467	REF	2	LAST 1229	11,3350	23370 1		3/4
0468				11,3351	53615 0	CAD	CALLRECT
0469	REF	2	LAST 1225	11,3352	13762 0		SL*
0470				11,3353	57615 0		OR
0471				11,3354	45271 1	CCV	3/4
0472				11,3355	00012 0		0 -7,2
0473	REF	1		11,3356	27741 0		2) ARVAL(TDELTAV) EQUALS OR EXCEEDS
0474				11,3357	77244 0	RPL	.01(ARVAL(PCV))
0475	REF	3	LAST 1229	11,3360	23370 1		
0476	REF	8	LAST 1206	11,3361	01527 0		
0477				11,3362	45246 0	ARVAL	DSU
0478	REF	4	LAST 1229	11,3363	13762 0		3/4
0479				11,3364	77600 1	BCV	
0480	REF	4	LAST 1229	11,3365	23370 1		CALLRECT
0481				11,3366	77640 0	BMN	
0482	REF	1		11,3367	23372 0		INTGPRTE
0483				11,3370	77624 1	CALLRECT CALL	
0484	REF	7	LAST 1224	11,3371	27673 0		RECTIFY
0485				11,3372	77775 1	INTEGRATE	VLCAD
0486	REF	9	LAST 1229	11,3373	01527 0		TNUV
0487	REF	1		11,3374	25134 0	STCVL	ZV
0488	REF	11	LAST 1229	11,3375	01521 0		TDELTAV
0489	REF	2	LAST 104	11,3376	01126 0	STORE	YV
0490				11,3377	77614 1	CLEAR	
0491	REF	1		11,3400	00261 1		JSWITCH
0492				11,3401	66375 0	DIFFCO	VLCAD
0493	REF	3	LAST 1229	11,3402	01126 0		SSP
0494	REF	24	LAST 1228	11,3403	01501 1		YV
0495				11,3404	00000 1		DIFFQONT
0496	REF	32	LAST 1228	11,3405	16032 1		0
0497	REF	3	LAST 1129	11,3406	24007 0	STODL	ALPHAV
0498	REF	3	LAST 1224	11,3407	02100 1		DPZERO
0499				11,3410	52014 0	STORE	H
0500	REF	2	LAST 1225	11,3411	00301 0	BCN	GOTO
0501	REF	1		11,3412	23714 1		JSWITCH
0502	REF	1		11,3413	22524 1		DCW..
0503				11,3414	52175 0	EARSPE	ACCOMP
						VLCAD	CCTC

START F AT ZERC. GOES 0(DELT/2)DELT.

L CREDITAL INTEGRATION

USER'S PAGE NO. 13 EQ S3

PC	OP	RF	CN	DT	PC	OP	RF	CN	DT	PC	OP	RF	CN	DT
0504	RFF	6	LAST	1228	11,3415	02195	1			RPOV				
0505	REF	1			11,3416	22325	0			INLUNCHK				
0506					11,3417	60545	0	LUNSPH	DLOAD	SR2				
0507					11,3420	00013	0			ICD				
0508					11,3421	50025	0		DSL	BMM				
0509	PEF	2	LAST	1229	11,3422	27743	1			RSHPFRE				
0510	PEF	3	LAST	1228	11,3423	23342	0			RECTEST				
0511					11,3424	71214	0			DLCAD				
0512	RFF	6	LAST	1228	11,3425	04340	1			RPOFLAG				
0513	RFF	2	LAST	1229	11,3426	23434	0			DCSWITCH				
0514	RFF	30	LAST	1228	11,3427	01517	0			TFT				
0515					11,3430	77624	1							
0516	REF	2	LAST	489	11,3431	32647	1			CALL				
0517					11,3432	77676	0			LUNPCS				
0518	REF	7	LAST	1230	11,3433	02105	1		VCOMP					
0519					11,3434	77624	1	DCSWITCH	STORE	PFCV				
0520	REF	1			11,3435	23441	0		CALL					
0521					11,3436	77650	1			ORIGCHNG				
0522	RFF	2	LAST	1229	11,3437	23372	0		ECTC					
0523					11,3440	45121	1			INTGRATE				
0524	REF	3	LAST	115	11,3441	02112	1		ORIGCHNG STO	CALL				
0525	REF	9	LAST	1229	11,3442	27673	0			CRIGEX				
0526					11,3443	53775	1			RECTIFY				
0527	PEF	25	LAST	1229	11,3444	01535	0		VLCAD	VSL*				
0528					11,3445	57576	1			RCV				
0529					11,3446	53651	0			Q,2				
0530	RFF	8	LAST	1230	11,3447	02105	1		VSL	VSL*				
0531					11,3450	57574	0			RPQV				
0532	LF	14	LAST	1216	11,3451	01503	0			2,2				
0533	REF	26	LAST	1230	11,3452	01535	0		STORE	BRECT				
0537					11,3453	57414	1		STORE	PCV				
0538	RFF	29	LAST	1228	11,3454	00343	0		ECF	VCOMP				
0539					11,3455	23456	1			MCCNFLAG				
0540					11,3456	53715	1			+1				
0541	RFF	18	LAST	1228	11,3457	01543	1		FVL	VSL*				
0542					11,3460	57576	1			VCV				
0543					11,3461	77651	0			Q,2				
0544					11,3462	77657	0		VSL					
0545					11,3463	57574	0		VSL*					
0546	RFF	11	LAST	1216	11,3464	01511	0			O +2,2				
0547	REF	15	LAST	1230	11,3465	01543	1		STORE	VRECT				
0548					11,346									

L CRPITAL INTEGRATION

USER'S PAGE NO. 14 EQ S3

P0555 THE RECTIFY SUBROUTINE IS CALLED BY THE INTEGRATION PROGRAM AND OCCASIONALLY BY THE MEASUREMENT INCORPORATION
 R0557 ROUTINES TO ESTABLISH A NEW CONIC.

0558				13,3673		BANK 13
0559	REF	2	LAST	46	13,2000	SFTLCC CRPITAL2
0560					13,3673	BANK
0561					13,3673	77354 0 RECTIFY LXA,2
0562	REF	17	LAST	1229	13,3674	02020 0 VLCAD
0563	REF	11	LAST	1229	13,3675	01521 0 PFCDY
0564					13,3676	53257 1 TDFLTAV
0565					13,3677	57675 0 VSL* VAC
0566	REF	27	LAST	1230	13,3700	01535 0 Q -7,2
0567	REF	15	LAST	1230	13,3701	01503 0 RCY
0568	REF	23	LAST	1231	13,3702	25535 0 STORE RREFCT
0569	REF	10	LAST	1229	13,3703	01527 0 STOV L RCY
0570					13,3704	53257 1 TNUV
0571					13,3705	57602 1 VSL* VAD
0572	REF	20	LAST	1230	13,3706	01543 1 Q -4,2
0573	REF	11	LAST	1230	13,3707	01511 0 VCV
0574	REF	21	LAST	1231	13,3710	25543 1 MINIRECT STORE VRFCY
0575	REF	11	LAST	1221	13,3711	24707 0 STOV L VCV
0576	REF	12	LAST	1231	13,3712	01521 0 ZERCVEC
0577	REF	11	LAST	1231	13,3713	15527 0 STORE TDFLTAV
0578	REF	12	LAST	1231	13,3714	24007 0 STOD L TNUV
0579	REF	10	LAST	1224	13,3715	01551 1 ZERCVEC
0580	REF	3	LAST	1215	13,3716	01553 0 STORE TC
0581					13,3717	77616 0 STORE XKEP
0582					11,3475	RVQ
0583	REF	2	LAST	1218	11,2000	BANK 11
0584					11,3475	SFTLCC CRPITAL
						BANK

L ORBITAL INTEGRATION

USER'S PAGE NO. 15 EC S3

R0585 THE THREE DIFFQ ROUTINES - DIFFQ+1, DIFFQ+12, AND DIFFQ+24 - ARE ENTERED TO PROCESS THE CONTRIBUTIONS AT THE
 R0587 BEGINNING, MIDDLE, AND END OF THE TIMESTEP, RESPECTIVELY. THE UPDATING IS DONE BY THE NYSIROM METHOD.

0585				11,3475	64575 1	DIFFQ+1	VLCAD	VSR3	
0590	REF	9	LAST 1228	11,3476	02062 1			FV	
0591	REF	2	LAST 115	11,3477	36046 0		STCALL	PHIV	
0592	REF	1		11,3500	23655 0			DIFFEQCM	
0593				11,3501	74575 0	DIFFQ+1	VLOAD	VSR1	
0594	REF	10	LAST 1232	11,3502	02062 1			FV	
0595				11,3503	53206 0		FLSH	VAD	
0596	REF	3	LAST 1232	11,3504	02046 1			PHIV	
0597	REF	2	LAST 115	11,3505	26054 1		STCVL	PSIV	
0598				11,3506	53262 0			VSR1	VAD
0599	REF	4	LAST 1232	11,3507	02046 1			PHIV	
0600	REF	5	LAST 1232	11,3510	36046 0		STCALL	PHIV	
0601	REF	5	LAST 1232	11,3511	23655 0			DIFFEQCM	
0602				11,3512	57345 1	DIFFQ+2	CLCAD	DMFR	
0603	REF	4	LAST 1229	11,3513	02100 1			H	
0604	REF	2	LAST 1218	11,3514	13772 1			DP2/3	
0605				11,3515	74206 0		FLSH	VXSC	
0606	REF	6	LAST 1232	11,3516	12046 1			PHIV	
0607				11,3517	53372 1		VSL1	VAD	
0608	REF	2	LAST 1229	11,3520	01134 0			ZV	
0609				11,3521	53361 1		VXSC	VAD	
0610	REF	5	LAST 1232	11,3522	02100 1			F	
0611	REF	4	LAST 1229	11,3523	01126 0			YV	
0612	REF	5	LAST 1232	11,3524	25126 0		STOVL	YV	
0613	REF	11	LAST 1232	11,3525	02162 1			FV	
0614				11,3526	53222 1		VSR3	VAD	
0615	REF	3	LAST 1232	11,3527	02054 1			PSIV	
0616				11,3528	76561 1		VXSC	VSL1	
0617				11,3531	77655 1			VAD	
0618	REF	3	LAST 1232	11,3532	01134 0			ZV	
0619	REF	4	LAST 1232	11,3533	01134 0		STORE	ZV	
0620				11,3534	45014 0		BOFF	CAIL	
0621	REF	2	LAST 1229	11,3535	00341 1			JSWITCH	
0622	REF	1		11,3536	23606 0			ENDSTATE	
0623	REF	21	LAST 1207	11,3537	11226 1			GRP2PC	
0624				11,3540	77354 0		LXA,2	VLCAD	
0625	REF	2	LAST 104	11,3541	01116 0			CCIRFG	
0626	REF	5	LAST 1232	11,3542	01134 0			ZV	
0627				11,3543	77732 1		VSL3		
0628	REF	31	LAST 1147	11,3544	12467 1		STORE	W +540,2	ADJUST W-POSITION FOR STORAGE
0629				11,3545	77775 1		VLCAD		
0630	REF	6	LAST 1232	11,3546	01126 0			YV	
0631				11,3547	40132 0		VSL3	BOV	
0632	REF	1		11,3550	23700 1			W*ATFND	
0633	REF	32	LAST 1232	11,3551	12401 1		STORE	W,2	
0634				11,3552	77524 1		CALL		
0635	REF	22	LAST 1232	11,3553	11206 1			GRP2PC	

L CRITICAL INTEGRATION

USER'S PAGE NO. 16 EQ S3

0636			11,3554	66354 0	LXA,2	SSP	
0637	REF	3	LAST 1232	11,3555	01116 0	CCLREG	
0638	REF	36	LAST 1224	11,3556	00052 0	S2	
0639				11,3557	00000 1	0	
0640				11,3561	67114 1	INCP,2	SXA,2
0641				11,3561	00016 1	6	
0642	REF	7	LAST 1232	11,3562	01125 0	YV	
0643				11,3563	45114 0	TX,2	CALL
0644	REF	1		11,3564	23651 1	PELOAESV	
0645	REF	23	LAST 1232	11,3565	11226 1	GRP2PC	
0646				11,3566	67154 0	LXA,2	SXA,2
0647	REF	8	LAST 1233	11,3567	01125 0	YV	
0648	REF	4	LAST 1233	11,3570	01116 0	CCLREG	
0649				11,3571	77624 1	NEXTCCL	CALL
0650	REF	24	LAST 1233	11,3572	11226 1		GRP2PC
0651				11,3573	76754 0	LXA,2	VLOAD*
0652	REF	5	LAST 1233	11,3574	01116 0		CCLREG
0653	REF	32	LAST 1232	11,3575	75376 1		W,2
0654				11,3576	77722 0	VSR3	
0655	REF	9	LAST 1233	11,3577	01126 0	STORE	YV
0656				11,3610	76173 0	VLOAD*	AXT,1
0657	REF	34	LAST 1233	11,3611	75313 1		W +540,2
0658				11,3612	00000 1		0
0659				11,3613	77722 0	VSR3	
0660	REF	6	LAST 1232	11,3614	35134 1	STCALL	ZV
0661	REF	1		11,3615	23401 0		DIFFG0
0662				11,3616	77200 0	ENDSTATE	BOV
0663	REF	2	LAST 1228	11,3617	23000 0		VLOAD
0664	REF	7	LAST 1233	11,3610	01134 0		GCPACUE
0665	REF	12	LAST 1231	11,3611	25527 0		ZV
0666	REF	10	LAST 1233	11,3612	01126 0	STOVL	TNUV
0667	REF	13	LAST 1231	11,3613	01521 0		YV
0668				11,3614	43114 0	STORE	TDELTAV
0669	REF	3	LAST 1215	11,3615	04715 0	PCN	RCFF
0670	REF	1		11,3616	27631 0		MIDAVFLG
0671	REF	22	LAST 1222	11,3617	01756 1		CKM102
0672	REF	5	LAST 1224	11,3620	27260 0		DIM0FLAG
0673				11,3621	77776 1		TESTLOOP
0674	REF	112	LAST 1217	11,3622	05352 1	EXIT	
0675				11,3623	04722 0	TC	PHASCHNG
0676	REF	70	LAST 1207	11,3624	05504 0	CCT	04022
0677	REF	4	LAST 1207	11,3625	00226 0	TC	UPFLAC
0678	REF	232	LAST 1217	11,3626	06142 1	ADDES	REINTFLG
0679				11,3627	77731 1	TC	INTPRET
0680	REF	19	LAST 1231	11,363	00052 1	SSP	
0681	REF	1		11,3631	23636 0		QPRET
0682				11,3632	52014 0		AMQVED
0683	REF	27	LAST 1213	11,3633	01714 1	PCN	GCTC
							VINTFLAG

ADJUST W-POSITION FOR INTEGRATION

ADJUST W-VELOCITY FOR INTEGRATION

CHECK FOR MID2 BEFORE GOING TO TIME1NC

PHASE 1
 PHASE CHANGE HAS OCCURRED BETWEEN
 INSTALL AND INTWAKE

L ORBITAL INTEGRATION

USER'S PAGE NO. 17 EO S3

0684	REF	5	LAST	1217	11,3634	26662 1			ATPCPSM
0685	REF	4	LAST	1217	11,3635	26735 1			ATOPLEM
0686					11,3636	66214 0	AMCVEC	SET	SSP
0687	REF	4	LAST	1232	11,3637	00061 0			JSWITCH
0688	REF	6	LAST	1233	11,3641	01117 1			COLREG
0689					11,3641	77741 0		CEC	-30
0690					11,3642	66214 0		BOFF	SSP
0691	REF	10	LAST	1213	11,3643	01755 1			060R9FLG
0692	REF	1			11,3644	23571 0			NEXTCCL
0693	REF	7	LAST	1234	11,3645	01117 1			CCLPEG
0694					11,3646	77717 0		CEC	-48
0695					11,3647	77650 1		GCTC	
0696	REF	2	LAST	1234	11,3650	23571 0			NEXTCCL

0697					11,3651	77745 1	RELCACSV	ELCAG		RELCACT TEMPORARY STATE VECTOR
0698	REF	9	LAST	1215	11,3652	01115 0			TDEC	FROM PERMANENT IN CASE OF
0699	REF	57	LAST	1214	11,3653	34041 0		STCALL	TDEC1	
0700	REF	1			11,3654	27142 0			INTEGRV2	BY STARTING AT INTEGRV2.
0701					11,3655	43345 1	DIFFQCOM	DLOAD	.DAD	INCREMENT H AND DIFEQCCT.
0702	REF	11	LAST	1228	11,3656	02376 1			DT/2	
0703	REF	6	LAST	1232	11,3657	02100 1			H	
0704					11,3660	66110 1		INCR,1	SXA,1	
0705					11,3661	77763 0		CEC	-12	
0706	REF	25	LAST	1229	11,3662	01500 0			DIFEQCCT	DIFEQCCT SET FOR NEXT ENTRY.
0707	REF	7	LAST	1234	11,3663	02100 1		STORE	H	
0708					11,3664	74561 0		VXSC	VSR1	
0709	REF	12	LAST	1232	11,3665	02162 1			FV	
0710					11,3666	74255 0		VAD	VXSC	
0711	REF	8	LAST	1233	11,3667	01134 0			ZV	
0712	REF	8	LAST	1234	11,3670	02100 1			H	
0713					11,3671	77655 1		VAF		
0714	REF	11	LAST	1233	11,3672	01126 0			YV	
0715	REF	33	LAST	1229	11,3673	02132 1		STORE	ALPHAV	
0716					11,3674	52014 0		ECN	GCTC	
0717	REF	5	LAST	1234	11,3675	00301 0			JSWITCH	
0718	REF	2	LAST	1225	11,3676	23714 1			DCW..	
0719	REF	1			11,3677	22504 0			FPR3	

0720					11,3700	42014 0	WMATEND	CLEAR	CLEAR	
0721	REF	23	LAST	1233	11,3701	01676 1			DIRFLAG	DO NOT INTEGRATE W THIS TIME
0722	REF	3	LAST	1217	11,3702	01671 0			CRBFLAG	INVALIDATE W
0723					11,3703	77614 1		CLEAR		
0724	REF	13	LAST	1217	11,3704	02676 1			RENDWFLG	
0725					11,3705	77414 0		SET	EXIT	
0726	REF	5	LAST	1209	11,3706	01472 1			STATFLG	PICK UP STATE VECTOR UPDATE
0727	REF	42	LAST	1216	11,3707	05567 0		TC	ALARM	
0728					11,3710	00421 0		OCT	421	
0729	REF	23	LAST	1233	11,3711	01642 1		TC	INTPRET	

GAP: ASSEMBLE REVISION 116 OF ACC PROGRAM LUMINAPY BY NASA 2021112-071

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0730			11,3712	7765.1
0731	REF	6	LAST 1233	11,3713 2726.0

COTD

TESTLOOP

FINISH INTEGRATING STATE VECTOR

L ORBITAL INTEGRATION

USFR'S PAGE NO. 15 EC S3

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P0732 ORBITAL ROUTINE FOR EXTRAPOLATION OF THE W MATRIX. IT COMPUTES THE SECOND DERIVATIVE OF EACH COLUMN POSITION
R0734 VECTOR OF THE MATRIX AND CALLS THE NYSTRON INTEGRATION ROUTINES TO SOLVE THE DIFFERENTIAL EQUATIONS. THE PROGRAM
R0736 USES A TABLE OF VEHICLE POSITION VECTORS COMPUTED DURING THE INTEGRATION OF THE VEHICLES POSITION AND VELOCITY.

0738                11,3714  70754 0  DOW..  LXA,2  DLOAD*
0739  REF 18  LAST 1231  11,3715  02030 0  PBDY
0740  REF 7  LAST 1224  11,3716  51770 0  MUEARTH,2
0741  REF 4  LAST 1223  11,3717  36072 1  STCALL BETAM
0742  REF 1  LAST 1222  11,3720  23742 1  DOW..1
0743  REF 13 LAST 1234  11,3721  02062 1  STCRF  FV
0744  REF 13 LAST 1234  11,3722  62014 0  BOF    INCR,1
0745  REF 5  LAST 1228  11,3723  00342 1  MIDFLAG
0746  REF 3  LAST 1227  11,3724  23264 0  NBRANCH
0747                11,3725  77771 0  DFC    -6
0748                11,3726  70744 1  LXC,2  DLOAD*
0749  REF 19 LAST 1236  11,3727  27330 0  PBDY
0750  REF 8  LAST 1236  11,3730  51772 1  MUEARTH -2,2
0751  REF 5  LAST 1236  11,3731  36072 1  STCALL BETAM
0752  REF 2  LAST 1236  11,3732  23742 1  DOW..1
0753                11,3733  50414 0  BCN    VSP6
0754  REF 31 LAST 1231  11,3734  11203 1  MCCNFLAG
0755                11,3735  23735 1  +1
0756                11,3736  77655 1  VAC
0757  REF 14 LAST 1236  11,3737  02062 1  FV
0758  REF 15 LAST 1236  11,3740  36062 0  STCALL FV
0759  REF 4  LAST 1236  11,3741  23264 0  ABRANCH
0760                11,3742  60575 0  DOW..1  VLOAD  VSP4
0761  REF 24 LAST 1234  11,3743  72132 1  ALPHAV
0762                11,3744  52513 0  PDVL*  UNIT
0763  REF 10 LAST 1222  11,3745  12132 0  VECTAB,1
0764                11,3746  46315 1  PDVL  VFRPJ
0765  REF 35 LAST 1236  11,3747  12032 1  ALPHAV
0766                11,3750  52361 1  VXSC  VSU
0767  REF 5  LAST 1229  11,3751  13762 0  3/4
0768                11,3752  60325 0  PDEL  NORM
0769                11,3753  00045 0  360
0770  REF 37 LAST 1233  11,3754  02062 0  S2
0771                11,3755  63416 0  PUSH  DSQ
0772                11,3756  77605 1  CMF
0773                11,3757  65301 0  NORM  PDDL
0774                11,3760  00043 0  360
0775  REF 6  LAST 1236  11,3761  02072 0  BETAM
0776                11,3762  56342 1  SR1    DCV
0777                11,3763  77761 1  VXSC
0778                11,3764  57154 0  LXA,2  XAD,2
0779  REF 38 LAST 1236  11,3765  00051 0  S2
0780  REF 39 LAST 1236  11,3766  00051 0  S2
0781                11,3767  57174 0  XAD,2  XAD,2
0782  REF 4  LAST 1236  11,3770  00051 0  S2
0783                11,3771  00042 1  360
0784                11,3772  43457 0  VSL*  RVQ

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L ORBITAL INTEGRATION

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```

0785      11,3773  57616 C      0 -8C,2
0787 REF 1      12,2111      SFTLCC ORBITAL1
0788      12,3755      BANK *****

0789      12,3755  04631 1 3/5 2DFC .6 B-2
0789      12,3756  23146 0
0790      12,3757  14010 1 THREE/8 2DEC .375
0790      12,3760  00000 1
0791      12,3761  02314 0 .3D 2DEC .3 B-2
0791      12,3762  21463 1
0792      12,3763  01400 1 3/64 2DEC 3 B-6
0792      12,3764  00000 1
0793      12,3765  10000 0 CP1/4 2DEC .25
0793      12,3766  00000 1
0794 REF 2 LAST 1191      12,3765      DQUARTER EQUALS DP1/4
0795 REF 3 LAST 1237      12,3765      POS1/4 EQUALS DP1/4
0796      12,3767  03000 1 3/32 2DEC 3 B-5
0796      12,3770  00000 1
0797      12,3771  36000 1 15/16 2DFC 15. B -4
0797      12,3772  00000 1
07982      05,3761      BANK 05
07982 REF 1      05,2111      SFTLCC ORBITAL3
07984      05,2761      BANK

07986      05,3761  30000 1 3/4 2DEC 3.0 B -2
07986      05,3762  00000 1
0799      05,3763  22525 0 7/12 2DEC .5833333333
0799      05,3764  12525 0
0800      05,3765  22000 1 5/16 2DEC 9 P -4
0800      05,3766  00000 1
0801      05,3767  01200 1 5/128 2DEC 5 B-7
0801      05,3770  00000 1
0802 REF 13 LAST 1231      12,2006      DPZERO EQUALS ZEROVEC
0803      05,3771  25252 0 CP2/3 2DEC .6666666667
0803      05,3772  25253 1
0804 REF 3 LAST 1232      05,3771      2/3 EQUALS DP2/3
0805      05,3773  00027 1 OCT27 CCT 27
0806      13,3720      BANK 13
0807 REF 3 LAST 1231      13,2000      SETLCC ORBITAL2
0808      13,3720      BANK
R0809 IT IS VITAL THAT THE FOLLOWING CONSTANTS NOT BE SHUFFLED
0810      13,3720  77764 1 DEC -11
0811      13,3721  77775 1 DEC -2
0812      13,3722  77766 0 DEC -9
0813      13,3723  77771 1 DEC -6
0814      13,3724  77775 1 DEC -2
0815      13,3725  77775 1 DEC -2
0816      13,3726  00000 1 DEC 0
0817      13,3727  77763 0 DEC -12
0818      13,3730  77766 0 DEC -9

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L ORBITAL INTEGRATION

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0819	13,3731	77773 1	DEC	-4
0820	13,3732	77773 1	ASCALE DEC	-7
0821	13,3733	77771 0	DEC	-6
0822	13,3734	24000 1	5/E 2DEC	5 B-3
0822	13,3735	00000 1		
0823	13,3736	74631 0	-1/12 2DEC	-0.1
0823	13,3737	63145 1		
0824	13,3740	00243 1	RECRATIC 2DEC	.01
0824	13,3741	22703 1		
0825	13,3742	03654 0	ESPHERE 2DEC	64373.76 E3 B-29
0825	13,3743	21000 1		
0826	13,3744	03654 0	RDM 2DEC	16093.44 F3 B-27
0826	13,3745	21000 1		
0827	13,3746	04627 0	RDE 2DEC	80467.20 F3 B-29
0827	13,3747	25200 1		
0828	00000		RATT	EQUALS 00
0829	00016		VATT	EQUALS 60
0830	00014		TAT	EQUALS 120
0831	00016		RATT1	EQUALS 140
0832	00024		VATT1	EQUALS 200
0833	00032		ML(P)	EQUALS 260
0834	00040		TDEC1	EQUALS 320
0835	00016		URPV	EQUALS 140
0836	REF 8 LAST 1227	00022	CCSPFI/2	EQUALS URPV +4
0837		00024	LZ	EQUALS 200
0838		00032	TVEC	EQUALS 260

L INFLIGHT ALIGNMENT ROUTINES

USER'S PAGE NO. 1 EQ S3

0001 22,3773 EANK 22
 0002 REF 2 LAST 325 23,2747 SETLOC INFLIGHT
 0003 23,3251 BANK
 0004 REF 23 LAST 966 55,1542 EBANK= XSM

0005 CALCOTA COMPUTES THE CYCLO TORQUE ANGLES REQUIRED TO BRING THE STABLE MEMBER INTO THE DESIRED ORIENTATION.

0007 THE INPUT IS THE DESIRED STABLE MEMBER COORDINATES REFERRED TO PRESENT STABLE MEMBER COORDINATES. THE THREE
 0009 HALF-UNIT VECTORS ARE STORED AT XDC, YDC, AND ZDC.

0011 THE OUTPUTS ARE THE THREE CYCLO TORQUING ANGLES TO BE APPLIED TO THE Y, Z, AND X CYCLES AND ARE STORED CP AT IGC,
 0012 MGC, AND CGC RESPECTIVELY.

0013	REF	1				COLLAT* \$\$/INFLT	
0014				23,3251	71221 1	CALCOTA	ITA DLCD
0015	REF	41	LAST 1236	23,3252	00051 0		PUSHDOWN 00-C3,160-270,340-370
0016	REF	6	LAST 966	23,3253	02665 0		XDC = (XC1 XD2 XD3)
0017				23,3254	65325 0	PDDL	YDC = (YC1 YC2 YC3)
0018	REF	16	LAST 1128	23,3255	06824 1		ZDC = (ZC1 ZC2 ZC3)
0019	REF	7	LAST 1239	23,3256	02671 0		H16ZEROS
0020				23,3257	55476 1	DDCMP	XDC +4
0021				23,3260	77656 1	UNIT	VDEF
0022	REF	1		23,3261	14027 1	STOCL	ZPRIME
0023	REF	2	LAST 1235	23,3262	00027 1		ZPRIME
0024				23,3263	77742 0	SR1	
0025	REF	12	LAST 1129	23,3264	14723 0	STOCL	SINTH
0026	REF	3	LAST 1235	23,3265	00133 1		ZPRIME +4
0027				23,3266	77742 0	SR1	
0028	REF	11	LAST 1129	23,3267	34021 0	STCALL	COSTH
0029	REF	4	LAST 323	23,3270	47322 1		ARCTRIG
0030	REF	2	LAST 124	23,3271	16742 1	STOCL	IGC
0031	REF	8	LAST 1235	23,3272	02667 1		XDC +2
0032				23,3273	77742 0	SP1	
0033	REF	13	LAST 1235	23,3274	14023 0	STOCL	SINTH
0034	REF	4	LAST 1236	23,3275	00027 1		ZPRIME
0035				23,3276	65205 0	DMP	PDDL
0036	REF	9	LAST 1239	23,3277	02671 0		XDC +4
0037	REF	5	LAST 1236	23,3278	00033 1		ZPRIME +4
0038				23,3301	45205 1	DMP	DSU
0039	REF	10	LAST 1235	23,3302	02665 0		XDC
0040				23,3303	77626 0	STADP	
0041	REF	12	LAST 1239	23,3304	43756 1	STCALL	COSTH
0042	REF	5	LAST 1235	23,3305	47322 1		ARCTRIG

$XP = UNIT(-XD3 \ 0 \ XD1) = (ZP1 \ ZP2 \ ZP3)$
 $SIN(IGC) = ZP1$
 $COS(IGC) = ZP3$
 $Y \ CYCLO \ TORQUING \ ANGLE \ FFACTION \ OF \ REV.$
 $SIN(MGC) = XD2$
 $PD00 = (ZP1)(XD3)$
 $MPAC = (ZP3)(XD1)$
 $COS(MGC) = MPAC - PD00$

L INFLIGHT ALIGNMENT ROUTINES

LSFR'S PAGE NO. 2 F5 S3

0043 REF 2 LAST 125 23,3316 26744 1
 0044 REF 6 LAST 1239 23,3317 00127 1
 0045 REF 4 LAST 924 23,3317 77641 1
 0046 REF 12 LAST 1239 23,3311 02711 0
 0047 REF 12 LAST 1239 23,3312 24 21 1
 0048 REF 7 LAST 1240 23,3313 00 27 1
 0049 REF 4 LAST 924 23,3314 77641 1
 0050 REF 14 LAST 1239 23,3315 02673 1
 0051 REF 14 LAST 1239 23,3316 34023 1
 0052 REF 6 LAST 1239 23,3317 47222 1
 0053 REF 14 LAST 962 23,3321 36740 1
 0054 REF 42 LAST 1239 23,3321 00051 0

STOVL MGC
 ZPRIME

DOT

ZDC

STOVL CCSTH

ZPRIME

DOT

YDC

STCALL SINTH

ARCTRIG

STCALL CGC

S2

Z GYRO TORQUING ANGLE FRACTION OF REV.

CCS(CGC) = ZP . ZDC

SIN(CGC) = ZP . YDC

X GYRO TORQUING ANGLE FRACTION OF REV.

L INFLIGHT ALIGNMENT ROUTINES

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R0055 ARCTRG COMPUTES AN ANGLE GIVEN THE SINE AND COSINE OF THIS ANGLE.

R0056 THE INPUTS ARE SIN/4 AND COS/4 STORED DP AT SINTH AND COSTH.

R0057 THE OUTPUT IS THE CALCULATED ANGLE BETWEEN +.5 AND -.5 REVOLUTIONS AND STORED AT THETA. THE OUTPUT IS ALSO,
R0059 AVAILABLE AT MRAC.

0060			23,3322	51545 1	ARCTRG	DLOAD	ABS	PUSHDCWA	160-210
0061	REF	15	LAST 1240	23,3323			SINTH		
0062				23,3324			BAN		
0063	REF	1		23,3325			QTSN45		ABS(SIN/4) - SIN(45)/4
0064	REF	1		23,3326			TRIG1		IF (-45,45) OR (135,-135)
0065				23,3327					
0066	REF	14	LAST 1240	23,3330		DLOAD	SL1		(45,135) OR (-135,-45)
0067				23,3331			COSTH		
0068	REF	16	LAST 1241	23,3332		ACCS	SIGN		
0069	REF	7	LAST 1129	23,3333			SINTH		
0070				23,3334		STORE	THETA		X = ARCCOS(COS) WITH SIGN(SIN)
						RVQ			
0071				23,3335					
0072	REF	17	LAST 1241	23,3336		TRIG1	SL1		(-45,45) OR (135,-135)
0073				23,3337			SINTH		
0074	REF	8	LAST 1241	23,3340			ASIN		
0075	REF	15	LAST 1241	23,3341			STJCL	THETA	X = ARCSIN(SIN) WITH SIGN(SIN)
0076				23,3342			COSTH		
0077	REF	1		23,3343			BAN		
							TRIG2		IF (135,-135)
0078				23,3344					
0079	REF	9	LAST 1241	23,3345		DLOAD	RVQ		
							THETA		X = ARCSIN(SIN) (-45,45)
0080				23,3346					
0081	REF	6	LAST 1138	23,3347		TRIG2	SIGN		(135,-135)
0082	REF	18	LAST 1241	23,3350			HIDPHALF		
0083				23,3351			SINTH		
0084	REF	10	LAST 1241	23,3352			DSU		
0085	REF	11	LAST 1241	23,3353			THETA		
0086				23,3354		STORE	THETA		X = .5 WITH SIGN(SIN) - ARCSIN(SIN)
						RVQ			(+) - (+) OR (-) - (-)

L INFLIGHT ALIGNMENT ROUTINES

USER'S PAGE NO. 4 E5 S3

R0087 SMP, NRM, AND AXISECT, WHICH USED TO APPEAR HERE, HAVE BEEN
R0088 COMBINED IN A ROUTINE CALLED AX*SR*T, WHICH APPEARS AMONG THE POWERED
R0089 FLIGHT SUBROUTINES.

L INFLIGHT ALIGNMENT ROUTINES

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R0090 CALCGA COMPUTES THE CDU DRIVING ANGLES REQUIRED TO BRING THE STABLE MEMBER INTO THE DESIRED ORIENTATION.

R0092 THE INPUTS ARE 1) THE NAVIGATION BASE COORDINATES REFERRED TO ANY COORDINATE SYSTEM. THE THREE HALF-UNIT
 R0094 VECTORS ARE STORED AT XNR, YNR, AND ZNR. 2) THE DESIRED STABLE MEMBER COORDINATES REFERRED TO THE SAME
 R0096 COORDINATE SYSTEM ARE STORED AT XSM, YSM, AND ZSM.

R0097 THE OUTPUTS ARE THE THREE CDU DRIVING ANGLES AND ARE STORED SP AT THETAD, THETAD +1, AND THETAD +2.

0099				23,3355	77631 0	CALCGA	SFTPC		PUSHDOWN	CU-05, 160-210, 34E-370
0100				23,3356	00001 0			0		
0101				23,3357	47375 0		VLOAD	VXV		
0102	REF	8	LAST	960	23,3360			XNB		XNB = OGA (OUTER GIMBAL AXIS)
0103	REF	2	LAST	124	23,3361			YSM		YSM = IGA (INNER GIMBAL AXIS)
0104					23,3362		UNIT	PUSH		PDC = UNIT(CGA X IGA) = MGA
0105					23,3363		EOT	ITA		
0106	REF	6	LAST	973	23,3364			ZNB		
0107	REF	43	LAST	1240	23,3365			S2		
0108	REF	16	LAST	1241	23,3366		STCVL	CCSTH		COS(CG) = MGA . ZNB
0109					23,3367			0		
0110					23,3370		EOT			
0111	REF	6	LAST	973	23,3371			YNR		
0112	REF	19	LAST	1241	23,3372		STCALL	SINTH		SIN(OG) = MGA . YNR
0113	REF	7	LAST	1240	23,3373			ARCTRG		
0114	REF	15	LAST	1240	23,3374		STCVL	CGC		
0115					23,3375			0		
0116					23,3376		VXV	DCT		PROVISION FOR MG ANGLE OF 90 DEGREES
0117	REF	0	LAST	1242	23,3377			XNB		
0118	REF	3	LAST	1242	23,3400			YSM		
0119					23,3401		SL1			
0120	REF	17	LAST	1243	23,3402		STCVL	CCSTH		COS(MG) = IGA . (MGA X CGA)
0121	REF	4	LAST	1242	23,3403			YSM		
0122					23,3404		EOT			
0123	REF	10	LAST	1243	23,3405			XNB		
0124	REF	20	LAST	1243	23,3406		STCALL	SINTH		SIN(MG) = IGA . OGA
0125	REF	8	LAST	1243	23,3407			ARCTRG		
0126	REF	3	LAST	1240	23,3410		STOPE	MGC		
0127					23,3411		ABS	DSL		
0128	REF	1			23,3412			.166...		
0129					23,3413		BFL			
0130	REF	1			23,3414			GIMLOCK1		IF ANGLE GREATER THAN 60 DEGREES
0131					23,3415		CALCCAL	VLOAD	DOT	
0132	REF	2	LAST	124	23,3416			ZSM		
0133					23,3417			0		
0134	REF	18	LAST	1243	23,3420		STOVI	CCSTH		COS(IG) = ZSM . MGA
0135	REF	24	LAST	1235	23,3421			XSM		

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ECT	STADR
STCALL	SINTH
	ARCTRIG

$$\text{SIN}(IC) = \text{XSM} \cdot \text{MCA}$$

```
STCVL  ICC
      OGC
PTB
      V1STC2S
STCALL THE TAD
      S2
```

```
GIMLOCK1 EXIT
      TC      ALARM
      CCT     00401
      TC      UPFLAG
      ACRES   GLOCKFAIL
```

GINERAL LECK HAS OCCURED

TC	INTERPT
GOTC	CALCGAI

L INFLIGHT ALIGNMENT ROUTINES

LSEF'S PAGE NO. 7 E5 S3

R0153 AXISGEN COMPLETES THE COORDINATES OF ONE COORDINATE SYSTEM REFERRED TO ANOTHER COORDINATE SYSTEM.

R0155 THE INPUTS ARE 1) THE STAR1 VECTOR REFERRED TO COORDINATE SYSTEM A STORED AT STARAC. 2) THE STAR2 VECTOR
 R0157 REFERRED TO COORDINATE SYSTEM A STORED AT STARAD +6. 3) THE STAR1 VECTOR REFERRED TO COORDINATE SYSTEM B STORED
 R0159 AT LOCATION 6 OF THE VAC AREA. 4) THE STAR2 VECTOR REFERRED TO COORDINATE SYSTEM B STORED AT LOCATION 12C OF
 R0161 THE VAC AREA.

R0162 THE OUTPUT DEFINES COORDINATE SYSTEM A REFERRED TO COORDINATE SYSTEM B. THE THREE HALF-UNIT VECTORS ARE STORED
 R0164 AT LOCATIONS XDC, XDC +6, XDC +12C, AND STARAC, STARAC +6, STARAC +12C.

0165			23,3443	66370 0	AXISGEN AXT,1	SSP	PUSHDOWN	00-30C,34C-37C
0166	REF 30	LAST 963	23,3444	02714 1		STARAD +6		
0167	REF 29	LAST 1226	23,3445	00051 0		S1		
0168	REF 31	LAST 1245	23,3446	02700 1		STARAD -6		
0169			23,3447	77601 0	SETPC			
0170			23,3450	00001 0		0		
0171			23,3451	46773 0	AXISGEN1 VLAD* VVX*		06D	LA = S1
0172	REF 32	LAST 1245	23,3452	02723 0		STARAD +12C,1		STARAD +30C UP = S1
0173	REF 33	LAST 1245	23,3453	02731 0		STARAD +18C,1		
0174			23,3454	77656 1	UNIT		12D	VA = UNIT(S1 x S2)
0175	REF 34	LAST 1245	23,3455	06731 1	STORE	STARAD +18C,1		STARAD +16C VP = UNIT(S1 x S2)
0176			23,3456	77773 1	VLAD*			
0177	REF 35	LAST 1245	23,3457	02723 0		STARAD +12C,1		
0178			23,3460	76433 1	VVX*	VSL1		
0179	REF 36	LAST 1245	23,3461	02731 0		STARAD +18C,1	18D	WA = LA x VA
0180	REF 27	LAST 1245	23,3462	06737 1	STORE	STARAD +24C,1		STARAD +12C WB = LB x VB
0181			23,3463	77700 0	TIX,1			
0182	REF 1		23,3464	47451 1	AXISGEN1			
0183			23,3465	66160 0	AXC,1	SXA,1		
0184			23,3466	07706 1		6		
0185			23,3467	07706 1		30C		
0186			23,3470	66370 0	AXT,1	SSP		
0187			23,3471	00022 1		18D		
0188	REF 30	LAST 1245	23,3472	00051 0		S1		
0189			23,3473	00006 1		6		
0190			23,3474	66374 1	AXT,2	SSP		
0191			23,3475	00006 1		6		
0192	REF 45	LAST 1244	23,3476	00052 0		S2		
0193			23,3477	00002 0		?		
0194			23,3500	76720 0	AXISGEN2 XCHX,1	VLAD*		
0195			23,3501	00036 1		30C	x1=-6 x2=+6	x1=-6 x2=+4 x1=-6 x2=+2
0196			23,3502	00001 1		0,1		

L INFLIGHT ALIGNMENT ROUTINES

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0197			23,3513	62757 0	VXSC#	PDVL*	J=(UA)(UE1)	J=(LA)(LE2)	J=(LA)(LB3)
0198	REF	38	LAST 1245	23,3514		STARAD +6,2			
0199				23,3515		6,1			
0200				23,3516		77757 1			
0201	REF	39	LAST 1246	23,3517		STARAD +120,2			
0202				23,3518		240	K=(VA)(VE1)	J=(VA)(VE2)	J=(VA)(VE3)
0203				23,3511		120,1			
0204				23,3512		52257 0			
0205	REF	40	LAST 1246	23,3513		STARAD +180,2	L=(WA)(WB1)	J=(WA)(WB2)	J=(WA)(WB3)
0206				23,3514		VAD			
0207				23,3515		VSL1			
0208				23,3516		240			
0209				23,3517		XCFX,1	UNIT		
0210	REF	11	LAST 1239	23,3517		300			
0211				23,3520		STORE	XDC +180,1	XDC = L+J+K	YDC = L+J+K
0212	REF	1		23,3521		TIJ,1			
0213				23,3522			AXISGEN3		
0214	REF	1		23,3523			AXISGEN2		
0215				23,3524			AXISGEN2		
0216	REF	12	LAST 1246	23,3525			AXISGEN2		
0217	REF	41	LAST 1246	23,3526			AXISGEN2		
0218	REF	5	LAST 1240	23,3527			AXISGEN2		
0219	REF	42	LAST 1246	23,3531			AXISGEN2		
0220	REF	5	LAST 1240	23,3532			AXISGEN2		
0221	REF	43	LAST 1246	23,3533			AXISGEN2		
0222				23,3534			AXISGEN2		

L INFLIGHT ALIGNMENT ROUTINES

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0281	23,3535	05520 0	QTSN45	2DEC	.1768
0281	23,3536	26075 1			
0282	23,3537	05252 1	.166...	2DEC	.1666666667
0282	23,3540	25253 1			

L INFLIGHT ALIGNMENT ROUTINES

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L POWERED FLIGHT SUBROUTINES

USER'S PAGE NO. 1 EC S3

0001 14,2775 BANK 14 SAME BANK AS THE FINDCOCU SUB-PROGRAM
 0002 REF 1 23,2444 SETLOC POWFLITE
 0003 23,3541 BANK
 0004 REF 1 0142 EBANK= DFXDEX
 0005 REF 1 COUNT# 44/POWFL

R0006 CDUTRIG, CDUTRIG1, CDUTRIG2, AND CD*TR*GS ALL COMPUTE THE SINES AND
 R0007 COSINES OF THREE 2'S COMPLEMENT ANGLES AND PLACE THE RESULT, DOUBLE
 R0008 PRECISION, IN THE SAME ORDER AS THE INPUTS, AT SINCDU AND COSCDU. AN
 R0009 ADDITIONAL OUTPUT IS THE 1'S COMPLEMENT ANGLES AT CDUSPCT. THESE
 R0010 ROUTINES GO OUT OF THEIR WAY TO LEAVE THE MPAC AREA AS THEY FIND IT,
 R0011 EXCEPT FOR THE GENERALLY UNIMPORTANT MPAC +2. THEY DIFFER ONLY IN
 R0012 WHERE THEY GET THE ANGLES, AND IN METHOD OF CALLING.

R0013 CDUTRIG (AND CDUTRIG1, WHICH CAN BE CALLED IN BASIC) COMPUTE THE
 R0014 SINES AND COSINES FROM THE CURRENT CONTENTS OF THE CCL REGISTERS.
 R0015 THE CONTENTS OF CDUTEMP, ETC., ARE NOT TOUCHED SO THAT THEY MAY
 R0016 CONTINUE TO FORM A CONSISTENT SET WITH THE LATEST FIF4 READINGS.

R0017 CDUTRIG1 IS LIKE CDUTRIG EXCEPT THAT IT CAN BE CALLED IN BASIC.

R0018 CD*TR*GS FINDS CCL VALUES IN CDUSPCT RATHER THAN IN CDUTEMP. THIS
 R0019 ALLOWS USERS TO MAKE TRANSFORMATIONS USING ARBITRARY ANGLES, OR REAL
 R0020 ANGLES IN AN ORDER OTHER THAN X Y Z. A CALL TO THIS ROUTINE IS
 R0021 NECESSARY IN PREPARATION FOR A CALL TO AX*SR*AT IN EITHER OF ITS TWO
 R0022 MODES (SMNB OR NSMB). SINCE AX*SR*AT EXPECTS TO FIND THE SINES AND
 R0023 COSINES IN THE ORDER Y Z X THE ANGLES MUST HAVE BEEN PLACED IN CDUSPCT
 R0024 IN THIS ORDER. CD*TR*GS NEED NOT BE REPEATED WHEN AX*SR*AT IS CALLED
 R0025 MORE THAN ONCE, PROVIDED THE ANGLES HAVE NOT CHANGED. NOTE THAT SINCE
 R0026 IT CLOBBERS BUF2 (IN THE SINE AND COSINE ROUTINES) CD*TR*GS CANNOT BE
 R0027 CALLED USING BANKCALL. SORRY.

R0028 CD*TR*G IS LIKE CD*TR*GS EXCEPT THAT IT CAN BE CALLED IN
 R0029 INTERPRETIVE.

0030		23,3541	77776	1	CDUTRIG	EXIT
0031	REF 1	23,3542	0 3551	0	TC	CDUTRIGS
0032	REF 235 LAST 1244	23,3543	0 6042	1	TC	INTPRFT
0033		23,3544	77616	0	RVQ	
0034		23,3545	77776	1	CD*TR*G	EXIT
0035	REF 1	23,3546	0 3557	0	TC	CD*TR*GS
0036	REF 236 LAST 1249	23,3547	0 6042	1	TC	INTPRFT
0037		23,3550	77616	0	RVQ	
0038	REF 17 LAST 941	23,3551	3 0032	0	CDUTRIGS	CPLX
0039	REF 26 LAST 960	23,3552	54 771	1	TS	CDUSPCT +4
0040	REF 8 LAST 941	23,3553	3 0033	1	CA	CCLV
0041	REF 27 LAST 1249	23,3554	54 765	1	TS	CDUSPCT

L POWERED FLIGHT SUBROUTINES

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0042	REF	11	LAST	941	23,3555	2 0034 0	CA	CDUZ	
0043	REF	28	LAST	1249	23,3556	54 767 0	TS	CDUSPCT +2	
0044					23,3557	0 0006 1	CF*TR*GS	EXTEND	
0045	REF	26	LAST	915	23,3560	22 142 0	DXCH	TFM2	
0046	REF	23	LAST	1069	23,3561	3 4751 0	CAF	FOUR	
0047	REF	19	LAST	1039	23,3562	7 6245 0	TF*GL**P	MASK	SIX
0048	REF	13	LAST	915	23,3563	54 142 0	TS	TFM3	MAKE IT EVEN AND SMALLER
0049	REF	14	LAST	1250	23,3564	50 143 1	INDEX	TFM3	
0050	REF	29	LAST	1250	23,3565	3 0765 0	CA	CDUSPCT	
0051	REF	743	LAST	1229	23,3566	52 155 1	DXCH	MPAC	STORING 2'S COMP ANGLE, LOADING MPAC
0052	REF	65	LAST	1065	23,3567	52 127 1	DXCH	VRUF +4	STORING MPAC FOR LATER RESTORATION
0053	REF	5	LAST	819	23,3570	0 4713 0	TC	USPRCADR	
0054	REF	15	LAST	574	23,3571	21577 1	CADR	CDULOGIC	
0055					23,3572	0 0006 1	EXTEND		
0056	REF	744	LAST	1250	23,3573	3 0155 0	DCA	MPAC	
0057	REF	15	LAST	1250	23,3574	50 143 1	INDEX	TFM3	
0058	REF	30	LAST	1250	23,3575	52 766 1	DXCH	CDUSPCT	STORING 1'S COMPLEMENT ANGLE
0059	REF	6	LAST	1250	23,3576	7 4713 0	TC	USPRCADR	
0060	REF	2	LAST	1005	23,3577	01517 0	CADR	CCSINE	
0061	REF	745	LAST	1250	23,3600	52 155 1	DXCH	MPAC	
0062	REF	16	LAST	1250	23,3601	50 143 1	INDEX	TFM3	
0063	REF	4	LAST	100	23,3602	52 744 1	DXCH	CCSCDU	STORING COSINE
0064					23,3603	0 0006 1	EXTEND		
0065	REF	17	LAST	1250	23,3604	5 0143 1	INDEX	TFM3	
0066	REF	31	LAST	1250	23,3605	3 0766 0	DCA	CDUSPCT	LOADING 1'S COMPLEMENT ANGLE
0067	REF	7	LAST	1250	23,3606	0 4713 0	TC	USPRCADR	
0068	REF	2	LAST	1005	23,3607	01531 1	CADR	SINE +1	SINE +1 EXPECTS ARGUMENT IN A AND L
0069	REF	66	LAST	1250	23,3610	52 127 1	DXCH	VRUF +4	BRINGING UP PRIOR MPAC TO BE RESTORED
0070	REF	746	LAST	1250	23,3611	52 155 1	DXCH	MPAC	
0071	REF	18	LAST	1250	23,3612	50 143 1	INDEX	TFM3	
0072	REF	4	LAST	100	23,3613	52 736 1	DXCH	SINCDL	
0073	REF	19	LAST	1250	23,3614	10 143 0	CCS	TFM3	
0074	REF	1			23,3615	1 3562 1	TCF	TR*GL**P	
0075	REF	27	LAST	1250	23,3616	0 0142 0	TC	TFM2	

L POWERED FLIGHT SUBROUTINE S

USER'S PAGE NO. 3 EC S3

P0076 *****

R0078 QUICKTRIG, INTENDED FOR GUIDANCE CYCLE USE WHERE TIME IS CRITICAL, IS A MUCH FASTER VERSION OF CD*TR*GS.
 R0081 QUICKTRIG COMPUTES AND STORES THE SINES AND COSINES OF THE 2'S COMPLEMENT ANGLES AT CDUSPCT, CDUSPCT +2,
 R0082 AND CDUSPCT +4. UNLIKE CD*TR*GS, QUICKTRIG DOES NOT LEAVE THE 1'S COMPLEMENT VERSIONS OF THE ANGLES IN
 R0084 CDUSPCT. QUICKTRIG'S EXECUTION TIME IS 4.1 MS; THIS IS 10 TIMES AS FAST AS CD*TR*GS. QUICKTRIG MAY BE
 R0086 CALLED FROM INTERPRETIVE AS AN RTE CP-CODE, OR FROM BASIC VIA BANKCALL OR IBANKCALL.

0090				23,3617	0 0014 0	QUICKTRIG INHINT		INHINT SINCE GAP USES THE SAME TEMPS
00901				23,3620	0 0006 1	EXTEND		
00902	REF	38	LAST	896	23,3621	22 061 0	EXCH	ITEMF1
0091	REF	24	LAST	1250	23,3622	3 4751 0	CAF	FCUR
0092	REF	20	LAST	1250	23,3623	7 6245 0	+	MASK
0093	REF	14	LAST	896	23,3624	54 062 1	TS	ITEMP2
0094	REF	15	LAST	1251	23,3625	50 062 1	INDEX	ITEMF2
0095	REF	32	LAST	1250	23,3626	3 0765 0	CA	CDUSPCT
0096	REF	5	LAST	605	23,3627	1 5033 1	TC	SPSIN
0097				23,3630	0 0006 1	EXTEND		
0098	REF	68	LAST	1124	23,3631	7 4736 0	MP	BIT14
0099	REF	16	LAST	1251	23,3632	50 062 1	INDEX	ITEMF2
0100	REF	5	LAST	1250	23,3633	52 736 1	EXCH	SINCDU
0101	REF	17	LAST	1251	23,3634	50 062 0	INDEX	ITEMP2
0102	REF	33	LAST	1251	23,3635	3 0765 0	CA	CDUSPCT
0103	REF	5	LAST	605	23,3636	0 5032 0	TC	SFCCS
0104				23,3637	0 0006 1	EXTEND		
0105	REF	65	LAST	1251	23,3640	7 4736 0	MP	BIT14
0106	REF	18	LAST	1251	23,3641	50 062 0	INDEX	ITEMF2
0107	REF	5	LAST	125	23,3642	52 744 1	EXCH	COSCDU
0108	REF	19	LAST	1251	23,3643	10 062 1	CCS	ITEMF2
0109	REF	5	LAST	905	23,3644	1 3623 1	TCF	QUICKTRIG +4
01091	REF	39	LAST	1251	23,3645	3 0061 0	CA	ITEMF1
0110				23,3646	0 0003 1	PELINT		
01101	REF	378	LAST	1211	23,3647	0 0000 1	TC	A

SCALE DOWN TO MATCH INTERPRETER OUTPUTS

L POWERED FLIGHT SUBROUTINES

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R0111 *****

R0113 THESE INTERFACE ROUTINES MAKE IT POSSIBLE TO CALL AX*SR*T, ETC., IN
R0114 INTERPRETIVE. LATER, WHERE POSSIBLE, THEY WILL BE ELIMINATED.

R0127 THESE INTERFACE ROUTINES ARE PERMANENT. ALL RESTORE USER'S EBANK
R0128 SETTING. ALL ARE STRICT INTERPRETIVE SUBROUTINES, CALLED USING "CALL",
R0129 RETURNING VIA QPRT. ALL EXPECT AND RETURN THE VECTOR TO BE TRANSFER-
R0130 RED INTERPRETER-STYLE IN MPAC; COMPONENTS AT MPAC, MPAC +3, AND MPAC +5.

R0131 TRG*SMNB AND TRG*NBSM BOTH EXPECT TO SEE THE 2'S COMPLEMENT ANGLES
R0132 AT COLSPCT (ORDER Y Z X, AT CEUSPCT, CEUSPCT +2, AND COLSPCT +4; CEE
R0133 LOCATIONS NEED NOT BE ZEROED). TRG*NBSM DOES THE NR TO SM TRANSFER-
R0134 MATION; TRG*SMNB, VICE VERSA.

R0135 CCL*NBSM DOES ITS TRANSFORMATION USING THE PRESENT CONTENTS OF
P0136 THE CCL COUNTERS. OTHERWISE IT IS LIKE TRG*NBSM.

R01361 CCL*SMNB IS THE COMPLEMENT OF CCL*NBSM.

01362				23,3650	77776	1	CCL*SMNB	EXIT	
01363	REF	2	LAST 1245	23,3651	0 2551	0	TC	CCLTRIGS	
01364	REF	1		23,3652	1 3655	0	TCF	C*MM*N1	

0137				23,3653	77776	1	TRG*SMNB	EXIT	
0138	REF	2	LAST 1245	23,3654	0 2557	0	TC	CD*TR*GS	
0139	REF	4	LAST 1062	23,3655	1 7535	0	C*MM*N1	TC	MPACVBUF
0140	REF	32	LAST 1061	23,3656	4 6250	1	CS	THREE	
0141	REF	2	LAST 614	23,3657	0 2677	1	C*MM*N2	TC	AX*SR*T
0142	REF	237	LAST 1245	23,3658	0 6742	1	TC	INTPRET	
0143				23,3661	43575	1	VLCAD	RVC	
0144	REF	67	LAST 1250	23,3662	10123	1		VBUF	

0145				23,3663	77776	1	CCL*NBSM	EXIT	
0146	REF	3	LAST 1252	23,3664	0 3551	0	TC	CCLTRIGS	
0147	REF	1		23,3665	1 3671	1	TCF	C*MM*N3	

0148				23,3666	77776	1	TRG*NBSM	EXIT	
0149	REF	3	LAST 1252	23,3667	0 2557	0	TC	CD*TR*GS	
0150	REF	5	LAST 1252	23,3670	0 7535	0	C*MM*N3	TC	MPACVBUF
0151	REF	33	LAST 1252	23,3671	2 6250	0	CA	THREE	
0152	REF	1		23,3672	1 3657	1	TCF	C*MM*N2	

R0153 *NBSM* AND *SMNB* EXPECT TO SEE THE SINES AND COSINES (AT SINCDL
P0154 AND COSCDL) RATHER THAN THE ANGLES THEMSELVES. OTHERWISE THEY ARE
R0155 LIKE TRG*NBSM AND TRG*SMNB.

R0156 NOTE THAT JUST AS CD*TR*GS NEED BE CALLED ONLY ONCE FOR EACH SERIES
R0157 OF TRANSFORMATIONS USING THE SAME ANGLES, SO TOO ONLY ONE OF TRG*NBSM

AX*SR*T EXPECTS VECTOR IN VBUF
SIGNAL FOR SM TO NB TRANSFORMATION

FOR AX*SR*T
SIGNAL FOR NB TO SM TRANSFORMATION

L POWERED FLIGHT SUBROUTINES

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R0158 AND TRC*SMNR NEED BE CALLED FOR EACH SERIES. FOR SUBSEQUENT TRANSFOR-
 R0159 MATIONS USE *NBSM* AND *SMNR*.

R0160				23,3673	77776	1	*SMNR*	EXIT	
R0161	REF	2	LAST 1252	23,3674	1 3655	0		TCF	C*MM*A1
R0162				23,3675	77776	1	*NFSM*	EXIT	
R0163	REF	2	LAST 1252	23,3676	1 3673	1		TCF	C*MM*A3

R0164 AX*SR*T COMPUTES THE OLD SMNR AND NBSM. FOR THE NB TO SM
 R0165 TRANSFORMATION, ENTER WITH +3 IN A. FOR SM TO NB, ENTER WITH -3.
 R0166 THE VECTOR TO BE TRANSFORMED ARRIVES, AND IS RETURNED, IN VBUF.
 R0167 AX*SR*T EXPECTS TO FIND THE SINES AND COSINES OF THE ANGLES OF ROTATION
 R0168 AT SINCDL AND COSCDL, IN THE ORDER Y Z X. A CALL TO CD*TR*GS, WITH
 R0169 THE 2'S COMPLEMENT ANGLES (ORDER Y Z X) AT CDLSPOT, WILL TAKE CARE OF
 R0170 THIS. HERE IS A SAMPLE CALLING SEQUENCE:-

R0171		TC	CDLSPOT
R0172		CS	THREE ("CA THREE" FOR NBSM)
R0173		TC	AX*SR*T

R0174 THE CALL TO CD*TR*GS NEED NOT BE REPEATED, WHEN AX*SR*T IS CALLED MORE
 R0175 THAN ONCE, UNLESS THE ANGLES HAVE CHANGED.

R0176 AX*SR*T IS GUARANTEED SAFE ONLY FOR VECTORS OF MAGNITUDE LESS THAN
 R0177 UNITY. A LOOK AT THE CASE IN WHICH A VECTOR OF GREATER MAGNITUDE
 R0178 HAPPENS TO LIE ALONG AN AXIS OF THE SYSTEM TO WHICH IT IS TO BE TRANS-
 R0179 FORMED CONVINCES ONE THAT THIS IS A RESTRICTION WHICH MUST BE ACCEPTED.

R0180	REF	2	LAST 1249	23,3677	54 142	1	AX*SR*T	TS	DEXDEX	WHERE IT BECOMES THE INDEX OF INDEXES
R0181				23,3700	0 0006	1		EXTEND		
R0182	REF	1		23,3701	22 145	1		CXCH	RTNSAVER	

R0183	REF	3	LAST 1253	23,3702	10 142	1	R*TL**R	CCS	DEXDEX	+3 --> 0	-3 --> 2
R0184	REF	4	LAST 1253	23,3703	4 0142	1		CS	DEXDEX	+2 --> 1	-2 --> 1
R0185	REF	34	LAST 1252	23,3704	6 6250	0		AD	THREE	+1 --> 2	-1 --> 0
R0186				23,3705	0 0006	1		EXTEND			
R0187	REF	379	LAST 1251	23,3706	5 0000	1		INDEX	4		
R0188	REF	1		23,3707	3 3766	0		CCA	INDEX1		
R0189	REF	1		23,3710	52 144	1		CXCH	DEX1		

R0190	REF	126	LAST 1175	23,3711	3 4753	1		CA	ONE		
R0191	REF	160	LAST 1107	23,3712	54 131	1		TS	BUF		
R0192				23,3713	0 0006	1		EXTEND			
R0193	REF	2	LAST 98	23,3714	5 0143	1		INDEX	DEX1		
R0194	REF	68	LAST 1252	23,3715	4 0123	0		CCS	VBUF		
R0195	REF	1		23,3716	1 3720	0		TCF	LCCP1		

R0196	REF	161	LAST 1253	23,3717	52 131	1	LOOP2	CXCH	BUF	REALLY BE A SUBTRACT, AND VICE VERSA
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LOADING VECTOR COMPONENT, STORING INDEX

L POWERED FLIGHT SUBROUTINES

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0197	REF 747	LAST 1250	23,3720	52 155 1	LCCP1	EXCH	MFAC		
0198	REF 1		23,3721	3 3764 1		CA	SINSLCC		
0199	REF 3	LAST 1253	23,3722	6 0143 1		AD	DEX1		
0200	REF 81	LAST 1068	23,3722	54 116 0		TS	ADDPWD		
0201	REF 21	LAST 1077	23,3724	0 7112 1		TC	DMPSUB	MULTIPLY BY SIN(CDUANGLE)	
0202	REF 5	LAST 1253	23,3725	10 142 1		CCS	DEXDEX		
0203	REF 749	LAST 1254	23,3726	52 155 1		EXCH	MPAC	NESM CASE	
0204			23,3727	1 3732 0		TCF	+3		
0205			23,3730	0 0006 1		EXTEND		SMAB CASE	
0206	REF 749	LAST 1254	23,3731	4 0155 1		ECS	MPAC		
0207	REF 1		23,3732	52 160 1		EXCH	TERMITMP		
0208	REF 21	LAST 1251	23,3733	3 6245 1		CA	SIX	SINCDU AND COSCDU (EACH 6 WORDS) MUST	
0209	REF 82	LAST 1254	23,3734	26 116 0		ADS	ADDRWD	BE CONSECUTIVE AND IN THAT ORDER	
0210			23,3735	0 0006 1		EXTEND			
0211	REF 162	LAST 1253	23,3736	5 0130 0		INDEX	BLF		
0212	REF 4	LAST 1254	23,3737	5 0143 1		INDEX	DEX1		
0213	REF 69	LAST 1253	23,3740	3 0123 1		CCA	VBULF		
0214	REF 750	LAST 1254	23,3741	52 155 1		EXCH	MPAC		
0215	REF 22	LAST 1254	23,3742	0 7112 1		TC	DMPSUB	MULTIPLY BY COS(CDUANGLE)	
0216	REF 751	LAST 1254	23,3743	52 155 1		EXCH	MPAC		
0217	REF 2	LAST 1254	23,3744	20 160 1		ECS	TERMITMP		
0218	REF 3	LAST 1254	23,3745	52 160 1		EXCH	TERMITMP		
0219			23,3746	20 0001 1		DDOUBL			
0220	REF 162	LAST 1254	23,3747	50 130 0		INDEX	PUF		
0221	REF 5	LAST 1254	23,3750	50 143 1		INDEX	DEX1		
0222	REF 71	LAST 1254	23,3751	52 123 0		EXCH	VBULF		
0223	REF 164	LAST 1254	23,3752	52 131 0		EXCH	BLF	LOADING INDEX, STORING VECTOR COMPONENT	
0224	REF 380	LAST 1253	23,3753	10 0000 0		CCS	A	'CAUSE THAT'S WHERE THE INDEX NOW IS	
0225	REF 1		23,3754	1 3717 1		TCF	LOOP2		
0226			23,3755	0 0006 1		EXTEND			
0227	REF 6	LAST 1254	23,3756	26 142 1		DIM	DEXDEX	DECREMENT MAGNITUDE PRESERVING SIGN	
0228	REF 7	LAST 1254	23,3757	10 142 1	TSTPCINT	CCS	DEXDEX	ONLY THE BRANCHING FUNCTION IS USED	
0229	REF 1		23,3760	1 3702 0		TCF	R*TL**P		
0230	REF 2	LAST 1253	23,3761	1 0145 1		TC	R*TL**P		
0231	REF 2	LAST 1254	23,3762	1 3702 0		TCF	R*TL**P		
0232	REF 3	LAST 1254	23,3763	0 0145 1		TC	R*TL**P		
0233	REF 6	LAST 1251	23,3764	00735 0	SINSLCC	ADRES	SINCDU	FOR USE IN SETTING ADDRWD	
0234			23,3765	00004 0	INDEX1	DFC	4	***** DON'T *****	
0235			23,3766	00002 0		DFC	2	***** TOUCH *****	
0236			23,3767	00000 1		DFC	0	***** THESE *****	

L POWERED FLIGHT SUBROUTINES

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0237 23,3770 00004 0 DFC 4 ***** CONSTANTS *****

R0238 *****

0241				10,2030		BANK	10
0241	REF	1		10,2030		SETLCC	FLESHCC
0242				10,2030		BANK	
0243	REF	1				CCOUNT	\$\$/PCWFL

R0244 ROUTINE FLESHPCT COMPUTES THE BODY-STABLE MEMBER TRANSFORMATION MATRIX (COMMONLY CALLED XNB) AND STORES
 P0246 IT IN THE LOCATIONS SPECIFIED BY THE ECADR ENTERING IN A.

0247				10,2030	77776 1	CALCSCMC	EXIT
0248	REF	301	LAST	965	10,2031	0 4616 1	TC BANKCALL
02481	REF	2	LAST	856	10,2032	20036 0	CADR FLESHPCT -1
02492	REF	238	LAST	1252	10,2033	0 6742 1	TC INTERPT
02493				10,2034	77616 0		RVC

0249	REF	11	LAST	1243	10,2035	02664 1	XNBECADR ECADR XNB
0250	REF	1			10,2036	3 2135 0	-1 CAF XNBECADR

0251	REF	28	LAST	1250	10,2037	54 142 1	FLESHPCT TS TEN2
0252	REF	64	LAST	1081	10,2040	56 003 1	XCF EBANK
0253	REF	25	LAST	1255	10,2041	56 142 0	XCF TEN2
0254	REF	15	LAST	1081	10,2042	7 4357 0	MASK LCK8
0255	REF	8	LAST	1091	10,2043	6 5007 0	AD OCT1400
0256	REF	22	LAST	1062	10,2044	54 141 1	TS TEN1

0257				10,2045	0 0006 1		EXTEND
0258	REF	3	LAST	480	10,2046	3 0744 0	CCA CCSCDUY
0259	REF	752	LAST	1254	10,2047	52 155 1	DXCH MFAC
0260	REF	18	LAST	789	10,2051	0 7106 1	TC DMP
0261	REF	7	LAST	910	10,2051	00745 1	ADRES CCSCDUZ
0262	REF	753	LAST	1255	10,2052	52 155 1	DXCH MFAC
0263				10,2053	20 001 1		DDOUBL
0264	REF	23	LAST	1255	10,2054	50 141 0	INDEX TEN1
0265				10,2055	52 001 1		DXCH 0 = CCSY CCSZ

0266				10,2056	0 0006 1		EXTEND
0267	REF	6	LAST	910	10,2057	3 0744 0	CCA SINCDUZ
0268	REF	24	LAST	1255	10,2061	50 141 0	INDEX TEN1
0269				10,2061	52 003 0		DXCH 2 = SIN2

0270				10,2062	0 0006 1		EXTEND
0271	REF	3	LAST	480	10,2063	4 0736 1	CCS SINCDUY
0272	REF	754	LAST	1255	10,2064	52 155 1	DXCH MFAC
0273	REF	23	LAST	1254	10,2065	0 7112 1	TC DMFSLP

ACCRWC SET TO CCSCDUZ

POWERED FLIGHT SUBROUTINES

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0274	REF 755	LAST 1255	10,2066	52 155 1	DXCH	MFAC	
0275			10,2067	20 001 1	DDCUBL		
0276	REF 25	LAST 1255	10,2070	50 141 0	INCEX	TEM1	
0277			10,2071	52 005 0	DXCH	4	= - SINY CCSZ
0278			10,2072	0 0006 1	EXTEND		
0279	REF 5	LAST 910	10,2073	4 0742 1	CCS	SINCDUX	
0280	REF 756	LAST 1256	10,2074	52 155 1	DXCH	MPAC	
0281	REF 24	LAST 1255	10,2075	0 7112 1	TC	DMPSPB	ADDPWD SET TO COSCDUZ STILL
0282	REF 757	LAST 1256	10,2076	52 155 1	DXCH	MFAC	
0283			10,2077	20 001 1	DDCUBL		
0284	REF 758	LAST 1256	10,2100	52 160 1	DXCH	MFAC	+2
0285			10,2101	0 0006 1	EXTEND		
0286	REF 6	LAST 1256	10,2102	4 0742 1	CCS	SINCDUX	
0287	REF 759	LAST 1256	10,2103	52 155 1	DXCH	MPAC	
0288	REF 19	LAST 1255	10,2104	0 7106 1	TC	DMP	
0289	REF 7	LAST 1255	10,2105	00737 1	ADRES	SINCDUZ	
0290			10,2106	0 0006 1	EXTEND		
0291	REF 760	LAST 1256	10,2107	4 0155 1	CCS	MFAC	
0292	REF 761	LAST 1256	10,2110	52 162 0	DXCH	MPAC	+5
0293	REF 20	LAST 1256	10,2111	0 7106 1	TC	DMP	
0294	REF 4	LAST 1255	10,2112	00735 0	ADRES	SINCDLY	
0295	REF 762	LAST 1256	10,2113	52 155 1	DXCH	MFAC	
0296			10,2114	20 001 1	DDCUBL		
0297			10,2115	20 001 1	DDCUBL		
0298	REF 763	LAST 1256	10,2116	52 162 0	DXCH	MFAC	+5
0299	REF 764	LAST 1256	10,2117	52 155 1	DXCH	MPAC	
0300	REF 21	LAST 1256	10,2120	0 7106 1	TC	DMP	
0301	REF 4	LAST 1255	10,2121	00743 1	ADRES	COSCDLY	
0302	REF 765	LAST 1256	10,2122	52 155 1	DXCH	MPAC	
0303			10,2123	20 001 1	DDCUBL		
0304			10,2124	20 001 1	DDCUBL		
0305	REF 165	LAST 1254	10,2125	52 131 0	DXCH	BUF	
0306			10,2126	0 0006 1	EXTEND		
0307	REF 5	LAST 1256	10,2127	3 0744 0	DCA	COSCDLY	
0308	REF 766	LAST 1256	10,2130	52 155 1	DXCH	MPAC	
0309	REF 22	LAST 1256	10,2131	0 7106 1	TC	DMP	
0310	REF 6	LAST 910	10,2132	00747 0	ADRES	COSCDLY	
0311	REF 767	LAST 1256	10,2133	52 155 1	DXCH	MFAC	
0312			10,2134	20 001 1	DDCUBL		
0313	REF 768	LAST 1256	10,2135	20 162 0	CAS	MPAC	+5
0314			10,2136	0 0006 1	EXTEND		
0315	REF 5	LAST 1256	10,2137	3 0736 0	DCA	SINCDLY	
0316	REF 769	LAST 1256	10,2140	52 155 1	DXCH	MFAC	
0317	REF 25	LAST 1256	10,2141	0 7112 1	TC	DMPSPB	ADDPWD SET TO COSCDUX
0318	REF 770	LAST 1256	10,2142	52 155 1	DXCH	MPAC	

L POWERED FLIGHT SUBROUTINES

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0319		10,2142	25 001 1
C320	REF 166 LAST 1256	10,2144	27 131 0

CCCL EL
CAS BUF

0321	REF	167	LAST	1257	10,2146	52	131	0
0322	REF	771	LAST	1256	10,2146	52	155	1

CXCH	RUF
CXCH	MFAC

0323				10,2147	0	006	1
0324	REF	772	LAST 1257	10,2150	3	0155	0
0325	REF	76	LAST 1256	10,2151	50	141	9
0326				10,2152	52	015	1

```
EXTEND
CCA      MFAC
INDEX    TEM1
EXCH     14
```

$$= \sin Y \cos X + \sin X \sin Z \cos Y$$

0327			10,2153	0 0036 1
0328	REF	773 LAST 1257	10,2154	3 0161 0
0329	REF	27 LAST 1257	10,2155	50 141 0
0330			10,2156	52 017 0

```

EXTEND
CCA      MPAC      +3
INDEX    TEM1
DXCH     16

```

$$= -\sin x \cos z$$

0331			10,2157	0 0006 1
0332	RFF 774	LAST 1257	10,2160	3 0162 1
0333	RFF 28	LAST 1257	10,2161	50 141 0
0334			10,2162	52 021 0

```
EXTEND
CCA      MFAC      +5
INDEX    TEM1
EXCH     20
```

$$= \cos x \cos y - \sin x \sin y \sin z$$

0335	RFF	29	LAST	1257	10,2163	3	0141	0
0336	RFF	83	LAST	1254	10,2164	54	115	0

CA	TEMP
TS	ACCRWD

Q337					10,2165	6 0076 1
Q338	REF	22	LAST	858	10,2166	2 0086 1
Q339	REF	25	LAST	1251	10,2167	6 4751 0

EXTFNE
DCA

0340	RFF	42	LAST	1108	10,2170	52	165	1
0341	PFF	37	LAST	1114	10,2171	3	4744	1

DXCH	LCC
CAF	BIT8

0342	REF	11	LAST	995	10,2172	54	023	1
0343	REF	2	LAST	1003	10,2173	1	7463	0

TS	ECCP
TCF	VXV

0344	REF 775	LAST 1257	10,2174	52	155	1
0345			1,2175	20	001	1

EXCISE MPAC
DOCLBL

0346	RFF	30	LAST	1257	1,2176	50	141	0
0347					1,2177	52	147	1

INDEX TEM1
CXCFT 6

0348	REF 776	LAST 1257	10,2200	52	160	1
0349			10,2201	20	001	1

EXCH MFAC +3
DOOUBL

0350	REF	31	LAST	1257	11,2202	50	141	0
0351					11,2203	52	011	0

INDEX	TFM1
CXCH	10

0352	REF 777	LAST 1257	10,2204	52	162	0
0353			10,2205	20	001	1

EXCH MPAC +5
CCCCBI

0354	REF	32	LAST	1257	10,2206	50	141	0
0355					10,2207	52	013	1

INDEX	TEM 1
CXCF	12

0356	REF	30	LAST	1255	10,221	2	0142	0
0357	REF	65	LAST	1255	10,2211	54	013	0

CA	TEM2
TS	EBANK
TCF	SWRETURN

0358 RFF 5 LAST 975 10,2212 1 4631 0

L TIME OF FREE FALL

USFR'S PAGE NO. 1 EQ S3

R0001 THE TFF SUBROUTINES MAY BE USED IN EITHER EARTH OR MOON CENTERED COORDINATES. THE TFF ROUTINES NEVER
 R0002 KNOW WHICH ORIGIN APPLIES. IT IS THE USER WHO KACKS, AND WHO SUPPLIES RONE, VONE AND 1/SQRT(MU) AT THE
 R0005 APPROPRIATE SCALE LEVEL FOR THE PROPER PRIMARY BODY.

R0006 EARTH ORIGIN POSITION -29 METERS
 R0007 VELOCITY -7 METERS/CENTISECOND
 R0009 1/SQRT(MU) +17 SQRT(CS SQ/METERS CUBED)

R0011 MOON ORIGIN POSITION -27 METERS
 R0012 VELOCITY -5 METERS/CENTISECONDS
 R0014 1/SQRT(MU) +14 SQRT(CS SQ/METERS CUBED)

R0016 ALL DATA PROVIDED TO AND RECEIVED FROM ANY TFF SUBROUTINE WILL BE AT ONE OF THE LEVELS ABOVE. IN ALL CASES,
 R0018 THE FREE FALL TIME IS RETURNED IN CENTISECONDS AT (-2E). PROGRAM TFF/CCNIC WILL GENERATE VONE/RTMU AND
 R0020 LEAVE IT IN VONE' AT (+1) IF EARTH ORIGIN AND (+9) IF MOON ORIGIN.

R0021 THE USER MUST STORE THE STATE VECTOR IN RONE, VONE AND MU IN THE FORM 1/SQRT(MU) IN TFF/RTMU
 R0023 AT THE PROPER SCALE BEFORE CALLING TFF/CCNIC. SINCE RONE, VONE ARE IN THE EXTENDED VERB STORAGE AREA,
 R0025 THE USER MUST ALSO LOCK OUT THE EXTENDED VERBS, AND RELEASE THEM WHEN FINISHED.
 R0027 PROGRAMS CALC/TFF AND CALC/TPR ASSUME THAT THE TERMINAL RADIUS IS LESS THAN THE PRESENT
 R0029 RADIUS. THIS RESTRICTION CAN BE REMOVED BY A 15 WORDING CHANGE, BUT AT PRESENT IT IS NOT DEEMED NECESSARY.

R0031 THE FOLLOWING FEASIBLE QUANTITIES ARE USED BY THE TFF ROUTINES, AND ARE LOCATED IN THE FLSH LIST.
 R0032
 R0034

ADDRESS	FEELW	F:	M:
A0035		IS USED FOR EARTH ORIGIN SCALE	
A0036			IS USED FOR MOON ORIGIN SCALE
A0037	TFFSW = 1190 BIT1	O = CALCTFF	I = CALCTPR
A0038	TFFDELQ = 100	G2-G1	E: (-16) M: (-15)
A0039	PMAC1 = 120	ARVAL(RM) M	E: (-29) M: (-27)
A0040	RPER = 140	PEPICSE RADIUS M	E: (-29) M: (-27)
A0041	TFFQ1 = 140	R.V / SQRT(MUE)	E: (-16) M: (-15)
A0042	SDCLF/2	SIN(THETA) /2	
A0043	CDCLF/2 = 140	CCS(THETA) /2	
A0044	R/PQ = 160	APDGE RADIUS M	E: (-29) M: (-27)
A0045	RTERM = 160	TERMINAL RADIUS M	E: (-29+NR)
A0046			M: (-27+NR)
A0047	RTERM = 180	TERMINAL RADIUS M	E: (-29) M: (-27)
A0048	TFFVSC = 200	-(V SQUARED/MU) 1/M	E: (20) M: (18)
A0049	TFF1/ALF = 220	SEMI MAJ AXIS M	E: (-22-2 NA)
A0050			M: (-20-2 NA)
A0051	TFFRTALF = 240	SQRT(ALFA)	E: (10+NA) M: (9+NA)
A0052	TFFALFA = 240	ALFA 1/M	E: (26-NR) M: (24-NR)
A0053	TFFNP = 280	SEMI LATUS RECTUM M	E: (-36+2 NR)
A0054			M: (-36+2 NR)
A0055	TFF/RTMU = 300	1/SQRT(MU)	E: (17) M: (14)
A0056	NRVAG = 320	PRESENT RADIUS M	E: (-29+NR)
A0057			M: (-27+NR)
A0058	TFFX = 340		
A0059	TFFTFM = 360	TEMPORARY	

L TIME OF FREE FALL

USER'S PAGE NO. 2 EO S3

A0060
A0061
A0062
A0063
A0064
A0065

REGISTERS S1, S2 ARE UNTOUCHED BY ANY TFF SUBROUTINE
INDEX REGISTERS X1, X2 ARE USED BY ALL TFF SUBROUTINES. THEY ARE ESTAB-
LISHED IN TFF/CONIC AND MUST BE PRESERVED BETWEEN CALLS TO SUBSEQUENT
SUBROUTINES.

-NR
-NA

C(X1) = NORM COUNT OF RMAG
C(X2) = NORM COUNT OF SGRT(ABS(ALFA))

L TIME OF FREE FALL

USER'S PAGE NO. 3 EC 53

P0066

R0067 SUBROUTINE NAME: TFFCONIC DATE: 01.29.67
 R0069 MOD NO: 1 LOG SECTION: TIME OF FREE FALL
 R0071 MOD BY: RR BAIRNSFATHER
 R0072 MOD NO: 1 MOD BY: RR BAIRNSFATHER DATE: 11 APR 67
 R0073 MOD NO: 2 MOD BY: RR BAIRNSFATHER DATE: 21 NOV 67 ADD MOON ML.
 R0075 MOD NO: 3 MOD BY: RR BAIRNSFATHER DATE: 21 MAR 68 ACCEPT DIFFERENT EARTH/MOON SCALES
 R0077 FUNCTIONAL DESCRIPTION: THIS SUBROUTINE IS CALLED TO COMPUTE THOSE CONIC PARAMETERS REQUIRED BY THE TFF
 R0079 SUBROUTINES AND TO ESTABLISH THEM IN THE PUSH LIST AREA. THE PARAMETERS ARE LISTED UNDER OUTPUT.
 R0081 THE EQUATIONS ARE
 R0082
$$H = RN \cdot V_A$$
 ANGULAR MOMENTUM
 R0083
$$LCP = H \cdot F / MU$$
 SEMI LATUS RECTUM
 R0085
$$ALFA = 2/RN - V_A \cdot V_A / MU$$
 RECIPROCAL SEMI MAJ AXIS, SIGNED
 R0086
 R0088
 R0089

R0091 AND ALFA IS POS FOR ELLIPTIC ORBITS
 R0092 0 FOR PARABOLIC ORBITS
 R0093 NEG FOR HYPERBOLIC ORBITS.
 R0094 SUBROUTINE ALSO COMPUTES AND SAVES PMAC.
 R0095 CALLING SEQUENCE:
 R0096 TFFCONIC EXPECTS CALLER TO ENTER WITH CORRECT GRAVITATIONAL CONSTANT IN MPAC, IN THE FORM
 R0098 $1/\sqrt{RTMU}$. PROGRAM WILL SAVE IN TFF/RTMU. THE SCALE IS DETERMINED BY WHETHER EARTH OR MOON
 R0100 ORIGIN IS USED. THE CALLER MUST LOCK OUT THE EXTENDED VERBS BEFORE PROVIDING STATE VECTOR IN RCNE,
 R0102 VONE AT PROPER SCALE. THE EXTENDED VERBS MUST BE RESTORED WHEN THE CALLER IS FINISHED USING THE
 R0104 TFF ROUTINES.
 R0105 ENTRY POINT TFFCONMU EXPECTS THAT TFF/RTMU IS ALREADY LOADED.
 R0107 TO SPECIFY ML: CLCAD CALL IF MU ALREADY STORED: CALL
 R0109 YOURML 1/RTMU E: (17) M: (14) TFFCONMU
 R0111 TFFCONIC
 R0112 PUSHLOC = PDL+1, ARBITRARY IF LEG 18C

R0113 SUBROUTINES CALLED: NCAR
 R0114 NORMAL EXIT CODES: FVC
 R0115 ALARMS: NONE
 R0116 OUTPUT: THE FOLLOWING ARE STORED IN THE PUSH LIST AREA.
 R0117 RMAG1 E: (-29) M: (-27) M RN, PRESENT RADIUS LENGTH.
 R0118 RMAC E: (-29+NR) M RMAG, NORMALIZED
 R0119 M: (-27+NR)
 R0120 X1 -NR, NCEN COUNT
 R0121 TFFNP E: (-29+2NR) M LCP, SEMI LATUS RECTUM, WEIGHTED BY NR. FOR VGAMCALC
 R0123 M: (-36+2NR)
 R0124 TFF/RTMU E: (17) M: (14) $1/\sqrt{RTMU}$
 R0125 TFFVSQ E: (20) M: (18) $1/\sqrt{SQ/MU}$: PRESENT VELFCITY, NORMALIZED. FOR VGAMCALC
 R0127 TFFALFA E: (26+NR) $1/\sqrt{ALFA}$, WEIGHTED BY NR
 R0128 M: (24+NR)
 R0129 TFFRTALF E: (10+NA) \sqrt{ALFA} , NORMALIZED
 R0130 M: (9+NA)

L TIME OF FREE FALL

LSFF'S PAGE NO. 4 EQ S3

R0131 X2 -NA, NCFM COUNT
 R0132 TFF1/ALF E: (-22-2NA) SIGNED SEMI MAJ AXIS, WEIGHTED BY NA
 R0133 M: (-20-2NA)
 R0134 PUSHLOC AT PCL+1
 R0135 THE FOLLOWING IS STORED IN GENERAL ERASABLE
 R0136 VCNF E: (10) M: (5) V/RT(MU), NORMALIZED VELOCITY
 R0137 ERASABLE INITIALIZATION RECLIFF:
 R0138 RONE E: (-29) M: (-27) M STATE VECTOR
 R0140 VONE E: (-7) M: (-5) M/CS STATE VECTOR
 R0142 TFF/PTMU E: (17) M: (14) 1/FTICS SQ/M CUBF
 R0144 EFFRIS: QPRFT, PCL+0 ... PCL+3
 R0145

LEFT BY CALLER
 LEFT BY CALLER
 IF ENTER VIA TFFCONMU.

0146 32,3762 BANK 33
 0147 RFF 1 27,2300 SETLOC TCF-FF
 0148 27,3360 BANK

0149 RFF 2 LAST 46 TO 46: 2 2* COUNT* \$\$/TFF

0150 RFF 4 LAST 717 27,3360 00037 0 TFFCONIC STORE TFF/PTMU 1/SQRT(MU) E: (17) M: (14)

0151 27,3361 52575 0 TFFCONIC VLOAD UNIT CCME HERE WITH TFFRTMU LOADED.
 0152 RFF 15 LAST 720 27,3362 02207 0 PCNT SAVED RM. M E: (-29) M: (-27)
 0153 27,3363 77725 1 PDDL UR/2 TO PCL+0, +5
 0154 27,3364 00045 0 360 MAGNITUDE
 0155 RFF 1 27,3365 00015 0 STORE RMAG1 M E: (-29) M: (-27)

0156 27,3366 77701 1 NCFM
 0157 RFF 68 LAST 1226 27,3367 00047 1 X1 -NR
 0158 RFF 1 27,3370 24041 1 STOVL NRMAG RMAG M E: (-29+NR) M: (-27+NR)
 0159 RFF 5 LAST 720 27,3371 02215 0 VONE SAVED VN. M/CS E: (-7) M: (-5)
 0160 27,3372 77761 1 VXSC
 0161 RFF 5 LAST 1261 27,3373 00037 0 TFF/PTMU E: (17) M: (14)
 0162 RFF 1 27,3374 02170 0 STORE VCNF VN/SQRT(MU) E: (10) M: (5)

0163 27,3375 47361 0 VXSC VXV
 0164 RFF 2 LAST 1261 27,3376 00041 1 NRMAG E: (-29+NR) M: (-27+NR)
 A0165 27,3377 47572 1 VSL1 VSC UR/2 FROM PCL
 0166 27,3400 14035 1 STCDL TFFNP BEFCPE: E: (-19+NR) M: (-18+NR)
 0167 RFF 1 27,3401 06514 1 TFF1/4 LC P M E: (-38+2NR) M: (-36+2NR)
 A0168 27,3402 63271 0 DDV SAVE ALSO FOR VGAMCALC
 0169 RFF 1 27,3403 00041 1 NRMAG (2/RMAG) 1/M E: (26-NR) M: (24-NR)
 0170 27,3404 02170 0 VCNF SAVED VN. E: (10) M: (5)
 0171 RFF 3 LAST 1261 27,3405 57436 1 VSC PCNMF KEEP *PAC+2 FCNEST FOR SQRT.
 0172 RFF 2 LAST 1261 27,3406 00025 0 STORE TFFVSC - (V SC/MU) E: (20) M: (18)
 0173 27,3407 42257 0 SP* DAD SAVE FOR VGAMCALC
 0174
 A0175
 0176

L TIME OF FREE FALL

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0177		27,341	20573 1		0 -6,1	GET -VSQ/MU	E:(26-NR)	M:(24-NR)
0178		27,3411	77626 0	STADR				
A0179						2/RMAG	FROM PDL+2	
0180	REF	1	27,3412	77744 0	STORE	TFFALFA	ALFA 1/M	E:(26-NR) M:(24-NR)
0181			27,3413	41457 1	SL*	PLSH	TEMP SAVE ALFA	E:(20) M:(18)
0182			27,3414	20173 0		0 -6,1		
0183			27,3415	75446 0	ABS	SQRT	E:(10) M:(9)	
0184			27,3416	77711 1	NORM			
0185	REF	29	27,3417	00050 1	X2		X2 = -NA	
0186	REF	1	27,3420	10031 0	STORE	TFFRTALF	SQRT(ABS(ALFA))	E:(10+NA) M:(9+NA)
0187			27,3421	75316 1	DSQ	SIGN	NOT SO ACCURATE, BUT OK	
A0188							ALFA FROM PDL+2	E:(20) M:(18)
0189			27,3422	55254 1	BZE	BDDV	SFT 1/ALFA =0, TO SHOW SMALL ALFA	
0190			27,3423	57425 0		+2		
0191	REF	2	27,3424	06514 1		TFF1/4		
0192	REF	1	27,3425	00027 1	+2	STORE	1/ALFA	E:(-22-2 NA) M:(-20-2 NA)
0193			27,3426	77616 0	DUMPCNIC	RVG		

A0194

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L TIME OF FREE FALL

USER'S PAGE NO. 6 EQ S2

P0195 SUBROUTINE NAME: TFFPP/PA DATE: 01.17.67
 P0197 MOD NC: 0 LOG SECTION: TIME OF FREE FALL
 P0199 MOD BY: RR BAIRNSFATHER
 P0200 MCE NC: 1 MOD BY: RR BAIRNSFATHER DATE: 11 APR 67
 P0201 MOD NC: 2 MOD BY: RR BAIRNSFATHER DATE: 21 MAR 68 ACCEPT DIFFERENT EARTH/MOON SCALES
 P0202 ALSO IMPROVE ACCURACY OF RAPC.
 P0203
 P0204 FUNCTIONAL DESCRIPTION: USED BY CALCTPER AND TFF DISPLAYS TO CALCULATE PERIGEE RADIUS AND ALSO
 P0205 APOGEE RADIUS FOR A GENERAL CONIC.
 P0206 PROGRAM GIVES PERIGEE RADIUS AS APOGEE RADIUS IS GIVEN BY
 P0207 $RE = P / (1+E)$ $PA = (1+E) / ALFA$
 P0208 WHERE $E = 1 - P / ALFA$
 P0209 IF RA IS NEGATIVE OR SHOWS EVIDENCE OF OVERFLOW, THEN RA = POSMAX BECAUSE
 P0210 1. APOGEE RADIUS IS NOT MEANINGFUL FOR HYPERBOLA
 P0211 2. APOGEE RADIUS IS NOT DEFINED FOR PARABOLA
 P0212 3. APOGEE RADIUS EXCEEDS THE SCALING FOR ELLIPSE.
 P0213 THIS SUBROUTINE REQUIRES THE SIGNED RECIPROCAL SEMI MAJ AXIS, ALFA, AND SEMI LATUS RECTUM AS DATA.
 P0214 CALLING SEQUENCE: CALL TFFPP/PA
 P0215 PUSHLOC = PDI+0, ARBITRARY IF LEQ 100
 P0216 C(MP/C) UNSPECIFIED
 P0217
 P0218 SUBROUTINES CALLED: NONE
 P0219 NORMAL EXIT CODE: RVC
 P0220 IF ELLIPSE, WITHIN NORMAL SCALING, RAPC IS CORRECT.
 P0221 OTHERWISE, RAPC = POSMAX.
 P0222 ALARMS: NONE
 P0223 OUTPUT: STORED IN PLSH LIST AREA. SCALE OF OUTPUT AGREES WITH DATA SUPPLIED TO TFF/CONIC.
 P0224 RPER E:(-29) M:(-27) M PERIGEE RADIUS DESTROYED BY CALCTFF/CALCTPER, TFFTRIG.
 P0225 RAPC E:(-29) M:(-27) M APOGEE RADIUS WILL BE DESTROYED BY CALCTFF/CALCTPER
 P0226 PUSHLOC AT PDI+0
 P0227 INITIALIZATION REQUIRED:
 P0228 TFFALFA E:(26-M) M 1/SEMI MAJ AXIS LEFT BY TFFCONIC
 P0229 M:(24-M)
 P0230 TFFRP E:(-38+2NP) M LC P, SEMI LATUS RECTUM LEFT BY TFFCONIC
 P0231 M:(-36+2NP)
 P0232 X1 -NP, NORM COUNT OF RMAP LEFT BY TFFCONIC
 P0233 X2 -NA, NORM COUNT OF ALFA LEFT BY TFFCONIC
 P0234 DEBRIS: QPRET, PDI+0 ... PDI+1

L TIME OF FREE FALL

USER'S PAGE NO. 8 EO S3

R0286 SUBROUTINE NAME: CALCTPER / CALCTFF
 R0288 MCD NC: 0
 R0290 MCD BY: RR BAIRNSFATHER
 R0291 MCD NC: 1 MCD BY: RR BAIRNSFATHER DATE: 21 MAR 67
 R0292 MCD NC: 2 MCD BY: RR BAIRNSFATHER DATE: 14 APR 67
 R0293 MCD NC: 3 MCD BY: RR BAIRNSFATHER DATE: 8 JUL 67 NEAR EARTH MUF AND NEG TFF (GONEPAST)
 R0295 MCD NC: 4 MCD BY: RR BAIRNSFATHER DATE: 21 NOV 67 AGC VARIABLE ML
 R0297 MCD NC: 5 MCD BY: RR BAIRNSFATHER DATE: 21 MAR 68 ACCEPT DIFFERENT EARTH/MCDN SCALES
 R0299 FUNCTIONAL DESCRIPTION: PROGRAM CALCULATES THE FREE-FALL TIME OF FLIGHT FROM PRESENT POSITION PN AND
 R0301 VELOCITY VN TO A RADIUS LENGTH SPECIFIED BY RTERM, SUPPLIED BY THE USER. THE POSITION VECTOR
 R0303 PN MAY BE ON EITHER SIDE OF THE CONIC, BUT RTERM IS CONSIDERED ON THE INBOUND SIDE.
 R0305 THE EQUATIONS ARE

R0306 $Q2 = -SQRT(RTERM (2 - RTERM ALFA) - LCP) \quad (INBOUND \ SIDE))$ LEQ +- LCE/SQRT(ALFA)
 R0308 $Q1 = PN.VN / SQRT(MU)$

R0309 $G1 = PN.VN / SQRT(MU)$ LEQ +- LCE/SQRT(ALFA)

R0311 $Z = NUM / DEN$ LEQ +- 1/SQRT(ALFA)

R0313 WHERE, IF INBOUND
 R0314 $NUM = RTERM - PN$ LEQ +- 2 LCE/ALFA
 R0316 $DEN = Q2 + Q1$ LEQ +- 2 LCE/SQRT(ALFA)

R0318 AND, IF OUTBOUND
 R0319 $NUM = Q2 - G1$ LEQ +- 2 LCE/SQRT(ALFA)
 R0321 $DEN = 2 - ALFA (RTERM + PN)$ LEQ +- 2 LCE

R0323 IF $ALFA \geq 1.0$ (FOR ALL CONICS EXCEPT ELLIPSES HAVING ABS(DEL ECC ANCM) < 90 DEG)

R0325 THEN $X = ALFA Z^2$
 R0326 AND $TFF = (RTERM + PN - 2 Z T(X)) Z / SQRT(MU)$

R0327 EXCEPT IF $ALFA \geq 1.0$, AND IF TFF NEG,
 R0328 THEN $TFF = 2 PI / (ALFA SQRT(ALFA)) + TFF$

R0329 OR IF $ALFA \geq 1.0$ (FOR ELLIPSES HAVING ABS(DEL ECC ANCM) < 90 DEG)

R0331 THEN $X = 1/ALFA Z^2$
 R0332 AND $TFF = (PI / SQRT(ALFA) - Q2 + Q1 + 2(X T(X) - 1) / ALFA Z) / ALFA SQRT(MU)$

R0334 WHERE $T(X)$ IS A POLYNOMIAL APPROXIMATION TO THE SERIES
 R0335 $1/2 - X/5 + X^2/7 - X^3/9 \dots$ ($X < 1.0$)
 R0336

R0337 CALLING SEQUENCE: TIME TO RTERM TIME TO PERIGEE
 R0339 CALL CALL
 R0340 CALL CALCTFF
 R0342 C(MPAC) = TERMAL RAD M C(MPAC) = PERIGEE RAD M
 R0344 FOR EITHER, P: (-25) M: (-27)
 R0345 FOR EITHER, PUSHLOC = PCL+0, ARBITRARY IF LEQ 80.

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R0346 SUBROUTINES CALLED: T(X), VIA RTB
 R0347 NORMAL EXIT MODE: PVC
 R0348 HOWEVER, PROGRAM EXITS WITH ONE OF THE FOLLOWING VALUES FOR TFF (-28) CS IN MPAC. USER MUST STORE.
 R0350 A. TFF= FLIGHT TIME. NORMAL CASE FOR POSITIVE FLIGHT TIME LESS THAN ONE ORBITAL PERIOD.
 R0352 B. (THIS OPTION IS NO LONGER USED.)
 R0353 C. TFF = POSMAX. THIS INDICATES THAT THE CONIC FROM THE PRESENT POSITION WILL NOT RETURN TO
 R0355 THE SPECIFIED ALTITUDE. ALSO INDICATES OUTBOUND PARABOLA OR HYPERBOLA.
 R0357 OUTPUT: C(MPAC) (-28) CS TIME OF FLIGHT, OR TIME TO PERIGEE
 R0358 TFFX (C) X, LEFT FOR ENTRY DISPLAY TFF ROUTINES
 R0360 RTTERM F: (-29+NR) M: RTERM, WEIGHTED BY NP LEFT FOR ENTRY DISPLAY TFF ROUTINES
 R0362 M: (-27+NR)
 R0363 TFFTEM F: (-59+2NR) LCP Z Z CON(SCOLF) LEFT FOR ENTRY DISPLAY TFF ROUTINES
 R0365 M: (-55+2NR) LCP /ALFA CON(SCOLF) LEFT FOR ENTRY DISPLAY TFF ROUTINES
 R0367 NOTE: TFFTEM = PDL 26D AND WILL BE DESTROYED BY .:UNIT.:
 R0368 RMAG1 F: (-29) M: (-27) PDL 12 NOT TOUCHED.
 R0369 TFFQ1 F: (-16) M: (-15) PDL 14D
 R0370 TFFDLO F: (-16) M: (-15) PDL 10D
 R0371 PLSHLCC AT PDL+1
 R0372 FRASABLE INITIALIZATION REQUIRED:
 R0373 PCAS F: (-29) M: (-27) M: STATE VECTOR LEFT BY USER
 R0375 VONF F: (+10) M: (+9) VN/SQRT(MU) LEFT BY TFF/CONIC
 R0377 RMAG1 F: (-29) M: (-27) PRESENT RADIALS, M LEFT BY TFF/CONIC
 R0379 C(MPAC) F: (-29) M: (-27) RTERM, TERMINAL RADIUS LENGTH, M LEFT BY USER
 R0381 THE FOLLOWING ARE STORED IN THE PUSH LIST AREA.
 R0382 TFF/PTMU F: (17) M: (14) 1/SQRT(MU) LEFT BY TFF/CONIC.
 R0384 RMAG F: (-29+NR) M: RMAG, NORMALIZED LEFT BY TFF/CONIC
 R0386 M: (-27+NR)
 R0387 X1 -NR, NORM COUNT LEFT BY TFF/CONIC
 R0389 TFFAP F: (-38+2NR) M: LCP, SEMI LATUS RECTUM, WEIGHT NR LEFT BY TFF/CONIC
 R0391 M: (-36+2NR)
 R0392 TFFALFA F: (26+NR) 1/M ALFA, WEIGHT NR LEFT BY TFF/CONIC
 R0394 M: (24+NR)
 R0395 TFFDALF F: (10+NR) SQRT(ALFA), NORMALIZED LEFT BY TFF/CONIC
 R0397 M: (0+NR)
 R0398 X2 -NA, NORM COUNT LEFT BY TFF/CONIC
 R0400 TFFI/ALF F: (-22-2NA) SIGNED SEMIMAJ AXIS, WEIGHTED BY NA LEFT BY TFF/CONIC
 R0402 M: (-20-2NA)
 R0403 DEERIS: CPRET, PDL+0 ... PDL+3
 R0404 RTERM F: (-29) M: (-27) RTERM, TERMINAL RADIUS LENGTH
 R0405 PAPQ F: (-29) M: (-27) PDL 16D (=RTERM)
 R0406 RPPF F: (-29) M: (-27) PDL 14D (=TFFQ1)

L TIME OF FREE FALL

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PC	REF	1	27,3465	77614	0	CALCTPER	SETGC		ENTER WITH RPER IN MFAC
0408			27,3466	03436	0			TFFSW	
0409	REF	1	27,3467	57472	1			+3	
0410			27,3470	77614	1	CALCTFF	CLEAR		ENTER WITH RTERM IN MFAC
0411			27,3471	03676	0			TFFSW	
0412	REF	2	LAST 1267	27,3472	0			RTERM	
0413	REF	1		00023	0	+3	STORE		E: (-29) M: (-27)
0414			27,3473	77557	0		SL*		
0415			27,3474	20201	0			0,1	X1=-MF
0416	REF	1		00021	1		STORE	RTERM	RTERM E: (-29+NR) M: (-27+NR)
0417			27,3476	44215	0		DNF	BDSU	
0418	REF	2	LAST 1264	27,3477	00023	1		TFEALFA	ALFA E: (26-NR) M: (24-NR)
0419	REF	4	LAST 1264	27,3500	06514	1		TFE1/4	
0420			27,3501	41216	0		FLST	DNF	(2-ALFA RTERM) (-3) TO PDL+0
0421	REF	2	LAST 1267	27,3502	00021	1		RTERM	E: (-29+NR) M: (-27+NR)
0422			27,3503	53725	1		PDDL	SR*	RTERM(2-ALFA RTERM) TO PDL+2
A0423									E: (-32+NR) M: (-30+NR)
0424	REF	4	LAST 1264	27,3504	00035	1		TFENP	LC P E: (-38+2NP) M: (-36+2NR)
0425				27,3505	21573	1		0 -6,1	X1 = -NR
0426				27,3506	43276	0		CCCMF	DAD
A0427									DUE TO SHIFTS, KEEP PRECISION FOR SQRT
A0428									RTERM(2-ALFA RTERM) FROM PDL+2
0429			27,3507	77657	0		SR*		E: (-22+NR) M: (-30+NP)
0430			27,3510	21601	1			0,1	LEAVE C: (-32) M: (-30)
0431			27,3511	71214	0		BCFF	DLCAC	X1 = -NR
0432	REF	3	LAST 1267	27,3512	03756	0		TFFSW	CHECK TFF / TPER SWITCH
0433			27,3513	57515	1			+2	
0434	REF	1		27,3514	76524	1		TFEZEROS	IF TFF, CONTINUE
0435			27,3515	75440	0	+2	BMN	SQRT	IF TPER, SET G2 = 0
									F: (-16) M: (-15)
0436	REF	1		27,3516	57650	0		MAXTFF1	NO FREE FALL CONIC TO RTERM FROM HERE
A0437									RESET PCL, SET TFF=POS MAX, AND EXIT.
0438			27,3517	41076	0		CCCMF	RCVB	RT IS ON INBOUND SIDE. ASSURE CVFIND=0
0439	REF	6	LAST 1264	27,3520	57753	1		TCDANZIG	ANY PORT IN A STCRM.
0440	REF	1		27,3521	24045	0		STOVL	G2 E: (-16) M: (-15)
0441	REF	2	LAST 1261	27,3522	02171	0		VCMF	VN/SQRT(MU) E: (10) M: (5)
0442			27,3523	52441	1		DOT	SL3	
0443	REF	16	LAST 1261	27,3524	02207	0		RCNE	SAVED PM. E: (-25) M: (-27)
0444	REF	1		27,3525	00017	1		STORE	G1, SAVE FOR CONEPAST TEST.
A0445									E: (-16) M: (-15)
0446			27,3526	44241	1		BMN	BDSU	
0447	REF	1		27,3527	57551	0		INBOUND	USE ALTERNATE Z
0448	REF	2	LAST 1267	27,3530	00045	0		TFEEM	G2 E: (-16) M: (-15)
A0449									
									CUTBCUNC Z CALC CONTINUES HERE
0450	REF	1							

L	TIME OF FREE FALL	USER'S PAGE NO.	11	EO S3
0453	REF 4 LAST 1261 27,3534 00041 1	NRMAC	RMAG E: (-29+NR) M: (-27+NR)	
A0454			(2-PTERM ALFA) (-3) FROM PDL+0	
0455	27,3535 51406 1	SAVECFN PUSH ABS	DEN TO PDL+0 E: (-3) CR (-16)	
A0456			M: (-3) CR (-15)	
0457	27,3536 40015 1	DAD BCV	INCETERMINANCY TEST	
0458	REF 1 27,3537 17757 1	LIM(-22)	=1.0-E(-22)	
0459	REF 1 27,3540 57561 1	TFEXTEST	GO IF DEN >= B(-22)	
0460	27,3541 65245 0	DLOAD PDDL	SET CFN=0 OTHERWISE	
0461	REF 2 LAST 1267 27,3542 06524 1	TFEZERS		
A0462			XCF ZERO WITH PDL+0	
0463	27,3543 57545 1	DLOAD DCOMP		
0464	REF 5 LAST 1267 27,3544 00333 1	TFALFA	ALFA E: (26-NR) M: (24-NR)	
0465	27,3545 71240 1	BMA DLOAD	FOR TPER: 2 INDET AT CELF/2=0 AND SC.	
0466	REF 1 27,3546 57655 0	TFEFL1	ASSUME SC, AND LEAVE 0 IN PDL: 1/2=0/N	
A0467				
0468	27,3547 77616 0	DUMPTFE1 PVQ	Z INDET. AT PERIGEE FOR PARAB OR HYPERB.	
			RETURN TFE =0	
A0469		INBOUND Z CALC CONTINUES HERE		
0470	27,3550 77745 1	INBOUND DLOAD	RESET PDL+0	
0471	27,3551 45345 1	DLOAD DSC	ALTERNATE Z CALC	
0472	REF 2 LAST 1267 27,3552 07723 0	DLOAD RTERM	E: (-29) M: (-27)	
0473	REF 2 LAST 1261 27,3553 00015 0	RMAG1	E: (-29) M: (-27)	
0474	REF 2 LAST 1267 27,3554 14043 0	STOCL TFEF	ALM=RTERM-RN E: (-29) M: (-27)	
0475	REF 2 LAST 1267 27,3555 00045 0	TFEDEM	G2 E: (-16) M: (-15)	
0476	27,3556 52015 1	DAD GCIC		
0477	REF 2 LAST 1267 27,3557 00017 1	TFEQ1	Q1 E: (-16) M: (-15)	
0478	REF 1 27,3560 57535 0	SAVECFN	CFN = G2+Q1 E: (-16) M: (-15)	
0479	27,3561 65215 1	TFEXTEST DAD PDDL	(ABS(CFN) TO PDL+2) E: (-3) CR (-16)	
A0480			M: (-3) CR (-15)	
0481	REF 1 27,3562 17761 1	DP(-22)	RESTORE ABS(DEN) TO MPAC	
0482	REF 3 LAST 1268 27,3563 00043 0	TFEX	NUM E: (-16) CR (-29) M: (-15) CR (-27)	
0483	27,3564 52605 1	EMP SR*		
0484	REF 2 LAST 1262 27,3565 00031 0	TFERTALF	SCPT(ALFA) E: (10+NA) M: (9+NA)	
0485	27,3566 57201 0		X2=-NA	
0486	27,3567 77671 1	CDV	C(MPAC) = NUM SQRT(ALFA) E: (-3) CR (-16)	
A0487			M: (-3) CR (-15)	
A0488			ABS(DEN) FROM PDL+2 E: (-3) CR (-16)	
A0489			M: (-3) CR (-15)	
0490	27,3570 40145 0	DLOAD BCV	(THE DLOAD IS SHARED WITH TFEFL1)	
0491	REF 4 LAST 1268 27,3571 00043 0	TFEX	NUM E: (-16) CR (-29) M: (-15) CR (-27)	
0492	REF 1 27,3572 57653 0	TFEFL1	USE EGN FOR CELF CEC 90, LEC -90	
A0493		OTHERWISE, CONTINUE FOR GENERAL CONIC FOR TFE EQN		
0494	27,3573 45471 1	CDV STADR		
A0495			DEN FROM PDL+0 E: (-3) CR (-16)	
A0496			M: (-3) CR (-15)	
0497	REF 4 LAST 1268 27,3574 77732 1	STORE TFEDEM	Z SAVE FOR SIGN OF SCCLF.	

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A0498									E: (-13) M: (-12)
0499			27,3575	63406 0	PLSH	DSQ			Z TC PDL+0
0500			27,3576	41206 0	PUSH	DMP			Z SC TC PDL+2 E: (-26) M: (-24)
0501	REF	5	27,3577	00035 1		TFFNF			LC P E: (-28+2NR) M: (-36+2NR)
0502			27,3600	75261 0	SL	SIGN			
0503			27,3601	20206 1		5			
0504	REF	5	27,3602	00045 0		TFFTEM			AFFIX SIGN FOR SDELF (ENTRY DISPLAY)
0505	REF	6	27,3603	14245 0	STOOL	TFFTEM			P ZSQ E: (-55+2NR) M: (-55+2NR)
A0506									(ARG IS USED IN TFF/TRIG)
A0507									ZSQ FROM PDL+2 E: (-26) M: (-24)
0508			27,3604	41206 0	PUSH	DMP			RESTORE PUSH LOC
0509	REF	6	27,3605	00033 1		TFFALFA			ALFA E: (26-NR) M: (24-NR)
0510			27,3606	77657 0	SL*				
0511			27,3607	20201 0		0,1			X1=-NR
0512	REF	5	27,3610	00043 0	STCRE	TFFX			X
0513			27,3611	41234 1	RTB	DMP			
0514	REF	1	27,3612	57735 1		T(X)			PCLY
A0515									ZSQ FROM PDL+2 E: (-26) M: (-24)
0516			27,3613	44302 0	SR2	RDSU			Z ZSQ T(X) E: (-29) M: (-27)
0517	REF	3	27,3614	00023 0		RTERM			RTERM E: (-29) M: (-27)
0518			27,3615	41215 1	DAD	DMP			
0519	REF	3	27,3616	00115 0		RMAG1			E: (-29) M: (-27)
A0520									Z FROM PDL+0 E: (-13) M: (-12)
0521			27,3617	51042 0	SR3	RFL			TFF SQRT(MU) E: (-45) M: (-42)
0522	REF	1	27,3620	57641 0		ENDTFF			(NO PUSH UP)
0523			27,3621	75206 1	PLSH	SIGN			TFF SQRT(MU) TC PDL+J
0524	REF	3	27,3622	00017 1		TFFQ1			G1 FOR GONEFAST TEST
0525			27,3623	71244 0	PFL	DLOCAD			CCNE PAST ?
0526	REF	1	27,3624	57645 1		NEGTEF			YES. TFF < 0
0527	REF	3	27,3625	00027 1		TFF1/ALF			1/ALFA E: (-22-2NA) M: (-20-2NA)
0528			27,3626	51076 1	CCCMF	RFL			ALFA > 0 ?
0529	REF	2	27,3627	57645 1		NEGTEF			NO. TFF IS NEGATIVE.
A0530									
									CORRECT FOR ORBITAL PERIOD.
0531			27,3630	77676 0	CCCMF				YES. CORRECT FOR ORB PERIOD.
0532			27,3631	56205 0	DMP	DCV			
0533	REF	1	27,3632	17755 0		PI/16			Z FI (-5)
0534	REF	3	27,3633	10021 0		TFFRTALF			SQRT(ALFA) E: (10+NA) M: (9+NA)
0535			27,3634	53657 0	SL*	SL*			
0536			27,3635	57602 1		0 -4,2			X2=-NA
0537			27,3636	57612 1		0 -4,2			
0538			27,3637	43257 0	SL*	DAD			
0539			27,3640	57576 1		0,2			
A0540									
0541			27,3641	40005 0	ENDTFF	DMP			TFF SQRT(MU) FROM PDL+0 E: (-45) M: (-42)
0542	REF	6	27,3642	00037 0		PCV			TFF SQRT(MU) IN MPAC E: (-45) M: (-42)
0543	REF	1	27,3643	57551 1		TFF/RTML			E: (17) M: (14)
						MAXTEF			SET PCSMAX IF OVFL.
0544			27,3644	77616 0	DLMPTFF2	RVQ			RETURN TFF (-28) CS IN MPAC.

L TIME OF FREE FALL

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0545 27,3645 77745 1 NEGTFE CLCAC
 A0546 27,3646 77650 1 GOTO
 0547 27,3647 57641 0 ENCTFF
 0549 27,3650 77745 1 MAXTFF1 DLOAD
 C550 27,3651 43545 1 MAXTFF CLCAC RVQ
 0551 REF 4 LAST 1264 27,3652 17771 0 NEARCNF
 R0552 TIME OF FLIGHT ELLIPSE WHEN DEL (ECCENTRIC ANOM) EQ 50 AND 150 -50.

TFF SCRT(MU) FROM PDL+0, NEGATIVE.

RESET PDL

A0553 27,3653 77712 0 TFFELL SL2
 A0554 27,3654 41465 0 BCDV PLSH
 0555 27,3655 45345 1 TFFELL1 DLOAD DSU
 0556 27,3656 10745 0 TFFTEM
 A0557 27,3657 00017 1 TFFQ1
 AC558 27,3650 14013 0 STODL TFFDELQ
 0559 27,3661 77626 0 STACK
 0560 REF 7 LAST 1269 27,3662 77732 1 STORE TFFTEM
 0561 REF 4 LAST 1269 27,3663 53615 1 DMP SL*
 0562 REF 1 27,3664 00027 1 TFF1/ALF
 AC563 27,3665 57576 1 0,2
 0564 27,3666 41206 0 DMP
 0565 REF 8 LAST 1270 27,3667 00345 0 TFFTEM
 0566 27,3670 41157 0 SL* BOVB
 0567 REF 4 LAST 1269 27,3671 57576 1 0,2
 0568 27,3672 21713 1 SIGNMPAC
 0569 27,3673 00043 0 STORE TFFX
 0570 REF 3 LAST 1270 27,3674 41234 1 DMP
 C571 27,3675 57735 1 T(X)
 0572 27,3676 00043 0 TFFX
 0573 REF 14 LAST 1210 27,3677 45242 1 SR3
 0574 REF 6 LAST 1269 27,3700 17763 0 DPL2(-3)
 0575 27,3701 41405 0 DMP FUSH
 0576 REF 2 LAST 1269 27,3702 41345 0 DLOAD DMP
 0577 REF 7 LAST 1270 27,3703 00345 0 TFFTEM
 0578 27,3704 00015 0 RMAG1
 0579 REF 1 27,3705 43212 0 SL2 QAD
 A0581 27,3706 00017 1 TFFQ1
 A0582 27,3707 14745 0 STODL TFFTEM
 A0583 27,3710 00035 1 TFFNP
 0584 27,3711 57605 1 DMP SL*

NUM FROM TFFX. F: (-16) OP (-29)
 M: (-15) CR (-27)

NUM E: (-14) CR (-27) M: (-13) CR (-25)
 TEMP SAVE C/N IN PDL+0
 DEN FROM PDL+0 E: (-3)/(16) M: (-3)/(-15)
 N/D TO PDL+C E: (11) M: (10)
 (ENTER WITH C/N=0 IN PDL+0)
 Q2 E: (-16) M: (-15)
 Q1 E: (-16) M: (-15)
 Q2-Q1 E: (-16) M: (-15)
 D/N FROM PDL+C

C/N E: (11) M: (10)

1//ALFA F: (-22-2NA) M: (-20-2NA)
 1/ALFA Z E: (-11-NA) M: (-10-NA)
 TO PDL+C
 1/2 F: (11) M: (10)

X2= -NA
 IN CASE x= 1.0, CONTINUE
 X=1/ALFA ZSQ

POLY

2(X T(X)-1) /2 ALFA E: (-15-NA)
 M: (-14-NA)
 1/ALFA Z FROM PDL+0 E: (-11-NA)
 M: (-10-NA)

GFT SIGN FOR SCLF

1/2 E: (11) M: (10)
 E: (-29) M: (-27)

Q1 E: (-16) M: (-15)
 (Q1+R 1/2) =SGN CF SCLF E: (-16) M: (-15)
 LC P E: (-3E+2NR) M: (-3E+2NR)
 CALC FOR ARG FOR TFF/TRIC.

L	TIME OF FREE FALL			USER'S PAGE NO. 14	EO S3
0592	REF 5 LAST 1270	27,3712	00027 1	TFF1/ALF	1/ALFA E:(-22-2NA) M:(-20-2NA)
0593		27,3713	57575 1	1,2	X2=-NA
0594		27,3714	53765 0	SIGN	SL*
0595	REF 12 LAST 1270	27,3715	00045 0	TFFTEM	AFFIX SIGN FOR SDFLF
0596		27,3716	57576 1	0,2	
0597	REF 13 LAST 1271	27,3717	14045 0	STOCL	TFFTEM
A0598					P/ALFA E:(-55+2NR) M:(-55+2NR)
0599	REF 6 LAST 1271	27,3720	00027 1	TFF1/ALF	(ARG FOR USE IN TFF/TRIC)
0600		27,3721	41366 1	SQRT	1/ALFA E:(-22-2NA) M:(-20-2NA)
0601	REF 2 LAST 1269	27,3722	17755 0	PI/16	PI (-4)
0602		27,3723	77615 0	CAD	
A0603					2(XT(X)-1)/Z ALFA FROM PDL E:(-15-NA)
A0604					M:(-14-NA)
0605		27,3724	45257 0	SL*	DSU
0606		27,3725	57577 0	0 -1,2	
0607	REF 2 LAST 127	27,3726	00013 0	TFFDELQ	G2-G1 E:(-16) M:(-15)
0608		27,3727	53605 1	DMP	SL*
0609	REF 7 LAST 1271	27,3730	00027 1	TFF1/ALF	1/ALFA E:(-22-2NA) M:(-20-2NA)
0610		27,3731	57601 1	0 -3,2	
0611		27,3732	52057 1	SL*	GCTC
0612		27,3733	57602 1	0 -4,2	
0613	REF 3 LAST 1270	27,3734	57641 0	ENDTFF	TFF SQRT(MU) IN MPAC E:(-45) M:(-42)

L TIME OF FREE FALL

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P0614 PROGRAM NAME: T(X) DATE: 01.17.67
 R0616 MOD NO: 0 LCG SECTION: TIME OF FREE FALL
 R0618 MOD BY: RR BAIRNSFATHER
 R0619 FUNCTIONAL DESCRIPTION: THE POLYNOMIAL T(X) IS USED BY TIME OF FLIGHT SUBROUTINES CALCTF AND
 R0621 CALCTF TO APPROXIMATE THE SERIES

$$1/3 - x/5 + x^2/7 - x^3/9 \dots$$

 R0622
 R0623
 R0624 WHERE $x = \text{ALFA Z Z}$ IF $\text{ALFA Z Z} \text{ LCG I}$
 R0625 $x = 1/(\text{ALFA Z Z})$ IF $\text{ALFA Z Z} \text{ G 1}$
 R0626 ALSO x IS NEG FOR HYPERBOLIC ORBITS
 R0627 $x = 0$ FOR PARABOLIC ORBITS
 R0628 x IS POSITIVE FOR ELLIPTIC ORBITS
 R0629 FOR FLIGHT 27R, THE POLYNOMIAL T(X) IS FITTED OVER THE RANGE (0,+1) AND HAS A MAXIMUM
 R0631 DEVIATION FROM THE SERIES OF 2 E-5 (T(X) IS A CHERYCHEV TYPE FIT AND WAS OBTAINED USING
 R0632 MAC PROGRAM AUTOCUFIT294RRR AND IS VALID TO THE SAME TOLERANCE OVER THE RANGE (-.08,+1).)
 R0635 CALLING SEQUENCE: RTP T(X)
 R0636 C(MPAC) = x
 R0637

R0638 SUBROUTINES CALLED: NONE
 R0639 NORMAL EXIT MODE: TO DANZIG
 R0640 ALARMS: NONE
 R0641 OUTPUT: C(MPAC) = T(X)
 R0642 ERASABLE INITIALIZATION REQUIRED:
 R0643 C(MPAC) = x
 R0644 DEEPS: NONE

R0645	REF 7 LAST 1181	27,3725	0.7225 0	T(X)	TC	POLY	
R0646		27,3736	0.0004 0		DEC	4	A-1
R0647		27,3737	12525 0		2DEC	3.332333333	E-1
R0647		27,3740	12525 0				
R0648		27,3741	71463 0		2DEC*	-1.959819125	E-1 *
R0648		27,3742	57703 1				
R0649		27,3743	04423 0		2DEC*	1.418148467	E-1 *
R0649		27,3744	17645 0				
R0650		27,3745	74614 0		2DEC*	-1.01310997	E-1 *
R0650		27,3746	42667 1				
R0651		27,3747	01626 1		2DEC*	5.60904986	E-2 *
R0651		27,3750	37256 1				
R0652		27,3751	77414 1		2DEC*	-1.536156925	E-2 *
R0652		27,3752	52071 0				
R0653	REF 60 LAST 1203	27,3753	0.6064 0	ENDT(X) TC	DANZIG		
R0654	REF 1	27,3753		TC DANZIG =	ENDT(X)		

L TIME OF FPD - FALL

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P0655 TFF CONSTANTS

C656 32,3764

BANK 32

0657 REF 2 LAST 46 27,2001

SETLCC TCF-FF1

0658 27,2154

BANK

A0659 NOTE _ NOTE _ ADJUSTED MUE FOR NEAR EARTH TRAJ.

A0660 MLE = 3.99J 815 471 F10 M CUPE/CS SQ

A0661 RTMUE = 1.997702549 E5 B-18* MODIFIED EARTH MU

A0663 NOTE _ NOTE _ ADJUSTED MUE FOR NEAR EARTH TRAJ.

A0664 MUM = 4.902 778 F8 M CUPE /CS SQ

A0665 PTMUM 2DEC* 2.21422176 E4 B-18*

0666 27,2754 06220 1 PT/16 2DEC 3.141592653 B-4

0666 27,3755 37553 0

0667 27,3756 37777 1 LIM(-22) 2OCT 37777 37700 1.0 -P(-22)

0667 27,3757 37777 1

0668 27,376J 00100 1 EP(-22) 2OCT 00000 00100 P(-22)

0668 27,3761 00100 1

0669 27,3762 14000 0 DP2(-3) 2DEC 1 B-3

0669 27,3763 00100 1

0670 27,3764 02000 0 DP2(-4) 2DEC 1 B-4 1/16

0671 27,3765 00100 1

R0671 RPAD1 2DEC 6373338 B-29 M (-29) =20 909 901.57 FT

0672 REF 4 LAST 717 23,2337 RPAD1 = RPAD

0673 27,3766 00305 1 R200K 2DEC 6464778 B-29 (-29) M

0673 27,3767 11205 0

0674 27,3770 37777 1 NEARONE 2DEC .999999999

0674 27,3771 37777 1

0675 REF 17 LAST 1235 23,2522 TFFZERCS EQUALS HI6ZERCS

0676 REF 1 23,2513 TFF1/4 EQUALS HI0P1/4

L AGC BLOCK TWO SELF-CHECK

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R0001 PROGRAM DESCRIPTION
 R0003 PROGRAM NAME - SELF-CHECK
 R0005 MOD NO - 1
 R0007 MOD BY - GALATT

DATE 20 DECEMBER 1967
 LCG SECTION AGC BLOCK TWO SELF-CHECK
 ASSEMBLY SUBROUTINE UTILITY REV 25

R0008 FUNCTIONAL DESCRIPTION

R0009 PROGRAM HAS TWO MAIN PARTS. THE FIRST IS SELF-CHECK WHICH RUNS AS A ZERO PRIORITY JOB WITH NO CORE SET, AS
 R0011 PART OF THE BACK-UP IDLE LOOP. THE SECOND IS SHOW-BANKSUM WHICH RUNS AS A REGULAR EXECUTIVE JOB WITH ITS OWN
 R0013 STARTING VERR.
 R0014 THE PURPOSE OF SELF-CHECK IS TO CHECK OUT VARIOUS PARTS OF THE COMPUTER AS OUTLINED BELOW IN THE OPTIONS.
 R0016 THE PURPOSE OF SHOW-BANKSUM IS TO DISPLAY THE SUM OF EACH BANK, ONE AT A TIME.
 R0020 IN ALL THERE ARE 7 POSSIBLE OPTIONS IN THIS BLOCK II VERSION OF SELF-CHECK. MORE DETAILED DESCRIPTION MAY BE
 R0022 FOUND IN E-2065 BLOCK II AGC SELF-CHECK AND SHOW-BANKSUM BY EDWIN D. SMALLY DECEMBER 1966, AND ADDENDA 2 AND 3.
 R0024 THE DIFFERENT OPTIONS ARE CONTROLLED BY PUTTING DIFFERENT NUMBERS IN THE SMODE REGISTER (NCU 27). BELOW IS
 R0026 A DESCRIPTION OF WHAT PARTS OF THE COMPUTER THAT ARE CHECKED BY THE OPTIONS, AND THE CORRESPONDING NUMBER, IN
 R0028 CCMAL, TO LOAD INTO SMODE.
 R0032 +-4 FRASABLE MEMORY
 R0034 +-5 FIXED MEMORY
 R0036 +-1,2,3,6,7,10 EVERYTHING IN OPTIONS 4 AND 5.
 R0038 +-1 SAME AS +-10 UNTIL AN ERROR IS DETECTED.
 R0040 +-1 NO CHECK, PUTS COMPUTER INTO THE BACKUP IDLE LOOP.

R0038 WARNINGS

R0039 USE OF 1 MEMORY RESERVED FOR SELF-CHECK (EVEN IN IDLE LOOP) AS TEMP STORAGE BY OTHER PROGRAMS IS DANGEROUS.
 R0041 SMODE SET GREATER THAN OCT 11 PUTS COMPUTER INTO BACKUP IDLE LOOP.

R0042 CALLING SEQUENCE

R0043 TO CALL SELF-CHECK KEY IN
 R0044 V 21 N 27 F OPTION NUMBER E
 R0047 TO CALL SHOW-BANKSUM KEY IN
 R0048 V 91 F DISPLAYS FIRST BANK
 R0049 V 33 E PROCEED, DISPLAYS NEXT BANK

R0050 EXIT MODES, NORMAL AND ALARM

R0051 SELF-CHECK NORMALLY CONTINUES INDEFINITELY UNLESS THERE IS AN ERROR DETECTED. IF SO + OPTION NUMBERS PUT
 R0053 COMPUTER INTO BACKUP IDLE LOOP, - OPTION NUMBERS RESTART THE OPTION.
 R0054 THE -3 OPTION PROCEEDS FROM THE LINE FOLLOWING THE LINE WHERE THE ERROR WAS DETECTED.
 R0057 SHOW-BANKSUM PROCEEDS UNTIL A TERMINATE IS KEYED IN (V 34 F). THE COMPUTER IS PUT INTO THE BACKUP IDLE LOOP
 R0059

R0060 CLEFL1

L AGC BLOCK TWO SELF-CHECK

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R0061 SELF-CHECK UPON DETECTING AN ERROR LOADS THE SELF-CHECK ALARM CONSTANT (01102) INTO THE FAILREG SET AND
 R0063 TURNS ON THE ALARM LIGHT. THE OPERATOR MAY THEN DISPLAY THE THREE FAILREGS BY KEYING IN V 05 N 09 E. FOR FURTHER
 R0065 INFORMATION HE MAY KEY IN V 05 N 08 E. THE DSKY DISPLAY IN R1 WILL BE ADDRESS+1 OF WHERE THE ERROR WAS DETECTED,
 R0067 IN R2 THE BECON OF SELF-CHECK, AND IN R3 THE TOTAL NUMBER OF ERRORS DETECTED BY SELF-CHECK SINCE THE LAST MAN
 R0069 INITIATED FRESH START (SLAP1).
 R0073 SHOW-BANKSUM STARTING WITH BANK 0 DISPLAYS IN R1 THE BANK SUM (A +-NUMBER EQUAL TO THE BANK NUMBER), IN R2
 R0075 THE BANK NUMBER, AND IN R3 THE BUGGER WORD.

R0076 ERASABLE INITIALIZATION REQUIRED

R0077 ACCOMPLISHED BY FRESH START
 R0078 SWOP SET TO 1

R0079 DEFER IS

R0080 ALL EXITS FROM THE CHECK OF ERASABLE (ERASCHK) RESTORE ORIGINAL CONTENTS TO REGISTERS UNDER CHECK.
 R0082 EXCEPTION IS A RESTART. RESTART THAT OCCURS DURING ERASCHK RESTORES ERASABLE, UNLESS THERE IS EVIDENCE TO DCLBT
 R0084 MEMORY, IN WHICH CASE PROGRAM THEN DOES A FRESH START (DEFSTART).

0085			25,3737		BANK 25
0086	REF 1		43,2000		SETLCC SELFCHFC
0087			43,2253		BANK
0088	REF 1				COUNT* #1/SELF
0089	REF 50	LAST 1091	4752	SBIT1	EQUALS BIT1
0090	REF 47	LAST 1091	4752	SBIT2	EQUALS BIT2
0091	REF 34	LAST 1091	4751	SBIT3	EQUALS BIT3
0092	REF 42	LAST 1091	4750	SBIT4	EQUALS BIT4
0093	REF 39	LAST 1006	4747	SBIT5	EQUALS BIT5
0094	REF 48	LAST 1046	4746	SBIT6	EQUALS BIT6
0095	REF 40	LAST 1088	4745	SBIT7	EQUALS BIT7
0096	REF 38	LAST 1257	4744	SBIT8	EQUALS BIT8
0097	REF 25	LAST 975	4743	SBIT9	EQUALS BIT9
0098	REF 37	LAST 1091	4742	SBIT10	EQUALS BIT10
0099	REF 27	LAST 1091	4741	SBIT11	EQUALS BIT11
0100	REF 21	LAST 1091	4740	SBIT12	EQUALS BIT12
0101	REF 42	LAST 1091	4737	SBIT13	EQUALS BIT13
0102	REF 70	LAST 1251	4736	SBIT14	EQUALS BIT14
0103	REF 42	LAST 1091	4735	SBIT15	EQUALS BIT15
0104	REF 227	LAST 1145	4755	S+ZER0	EQUALS ZERO
0105	REF 51	LAST 1275	4753	S+1	EQUALS BIT1
0106	REF 48	LAST 1275	4752	S+2	EQUALS BIT2
0107	REF 35	LAST 1253	6250	S+3	EQUALS THREE
0108	REF 26	LAST 1257	4751	S+4	EQUALS FOUR
0109	REF 20	LAST 1026	4756	S+5	EQUALS FIVE
0110	REF 22	LAST 1254	6245	S+6	EQUALS SIX

L ACC BLOCK TWO SELF-CHECK

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0111	REF	17	LAST	1091	4757	S+7	EQUALS	SEVEN	
0112	REF	16	LAST	1255	4357	SERITS	EQUALS	LCW8	
0113	REF	2	LAST	305	4771	CNTPCON	=	OCT50	
0114					43,3253	00061 0	ERASCCN1	CCTAL	00061
0115					43,3254	01373 1	ERASCCN2	CCTAL	01373
0116	REF	9	LAST	1255	5007		ERASCCN6	=	OCT1400
0117					43,3255	01461 0	ERASCCN3	CCTAL	01461
0118					43,3256	01773 0	ERASCCN4	CCTAL	01773
0119	REF	20	LAST	1016	5012		S10BITS	EQUALS	LCW10
0120	REF	2	LAST	500	5020		SENK03	EQUALS	PPIC6
0121	REF	7	LAST	1091	4350		-MAXADRS	=	H15
0122					43,3257	00060 1	SIXTY	CCTAL	00060
0123					43,3260	60017 1	SUPRCN	CCTAL	60017
0124					43,3261	17777 0	S13BITS	CCTAL	17777
0125					43,3262	25252 0	CCNC+S1	CCTAL	25252
0126					43,3263	52400 1	CCNC+S2	CCTAL	52400
0127					43,3264	76777 1	ERASCCN5	CCTAL	76777
0128	REF	2	LAST	233	5650		S-7	=	CCT77770
0129	REF	2	LAST	1000	6115		S-4	EQUALS	NEG4
0130	REF	3	LAST	883	7750		S-3	EQUALS	NEG3
0131	REF	7	LAST	1095	7751		S-2	EQUALS	NEG2
0132	REF	12	LAST	1091	7752		S-1	EQUALS	NEGONE
0133	REF	24	LAST	595	4754		S-ZERC	EQUALS	NEG0

00377

USED IN CNTRCHK

USED IN ERASCHK

USED IN ERASCHK

USED IN ERASCHK

USED IN ERASCHK

USED IN ERASCHK

01777, USED IN ERASCHK

06000, USED IN ROPECHK

FOR RCFFCHK

USED IN ROPECHK

USED IN CYCLSHFT

USED IN CYCLSHFT

0134	REF	46	LAST	1124	03,1400		EBANK=	LST1
0135	REF	3	LAST	292	43,3265	01371 0	ADRS1	ADRES
0136	REF	4	LAST	1108	43,3266	03357 0	SELFADRS	ADRES

SELFCHK RETURN ADDRESS. SHOULD BE PUT
IN SELFCHK WHEN GOING FROM SELFCHK TO
SHOWSUM AND PUT IN SKEEF1 WHEN GOING
FROM SHOWSUM TO SELF-CHECK.

A0137
AC136
A0139

0140	REF	6	LAST	216	43,3267	3 1360 0	PPERRORS	CA	PRESTOPP
0141					43,3270	0 0005 1		EXTEND	
0142	REF	1			43,3271	1 2300 0	BZF	ERRORS	
0143					43,3272	0 0006 1		EXTEND	
0144	REF	3	LAST	216	43,3273	3 1376 1	CCA	SKEEP5	
0145	REF	3	LAST	216	43,3274	51'377 0	INDEX	SKEEP7	
0146					43,3275	52 001 1	CXCF	0000	
0147	REF	2	LAST	251	43,3276	3 4755 1	CA	S+ZERC	
0148	REF	7	LAST	1276	43,3277	55'360 1	TS	ERESTORE	
0149					43,3300	0 0004 0	ERRORS	INT-INT	
0150	REF	328	LAST	1204	43,3301	3 0002 0	CA	Q	
0151	REF	3	LAST	473	43,3302	55'357 0	TS	SFAIL	
0152	REF	3	LAST	306	43,3303	55'363 1	TS	ALMCADP	
0153	REF	3	LAST	212	43,3304	25'265 0	INCR	ERCOUNT	
0154	REF	1			43,3305	0 5571 1	TOTALARM2	TC	ALARM2
0155					43,3306	01102 0	CCT	01102	
0156	REF	5	LAST	306	43,3307	11'362 0	CCS	SMODE	
0157	REF	3	LAST	1276	43,3310	3 4755 1	STELCCP	CA	S+ZERC
0158	REF	6	LAST	1276	43,3311	55'262 0	TS	SMODE	

IS IT NECESSARY TO RESTORE ERASABLE

NO

RESTORE THE TWO ERASABLE REGISTERS

SAVE Q FOR FAILURE LOCATION
FOR DISPLAY WITH EBANK AND ERCOUNT
KEEP TRACK OF NUMBER OF MALFUNCTIONS.

SELF-CHECK MALFUNCTION INDICATOR

L AGC BLOCK TWO SELF-CHECK

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0159	REF	5	LAST 1276	43,3312	0 3357 0	TC	SELFCHK	GO TO IDLE LOCP
0160	REF	4	LAST 1276	43,3313	0 1357 1	TC	SFALL	CONTINUE WITH SELF-CHECK
0161	REF	381	LAST 1254	43,3314	1 0 0 0	-ICLK	CCS	A
0162	REF	1		43,3315	1 2267 0	TCF	PRFRRCPS	
0163	REF	2	LAST 1277	43,3316	1 2267 0	TCF	PRFRRCPS	
0164	REF	382	LAST 1277	43,3317	1 0 0 0	CCS	A	
0165	REF	3	LAST 1277	43,3320	1 2267 0	TCF	PRFRRCPS	
0166	REF	329	LAST 1276	43,3321	0 0 0 0	TC	Q	
0167				43,3322	0 0 0 1	SMDECHK	EXTEND	
0169	REF	4	LAST 1276	43,3323	2 3 3 1	QXCH	SKFEP1	
0169	REF	1		43,3324	0 3353 1	TC	CHKCKNJ	CHECK FOR NEW JOB
0170	REF	7	LAST 1276	43,3325	1 1 3 2	CCS	SMODE	
0171	REF	1		43,3326	0 2223 1	TC	SCPTICNS	
0172	REF	1		43,3327	0 3324 1	TC	SMODECHK +2	TO BACKUP IDLE LOCP
0173	REF	2	LAST 1277	43,3330	0 2223 1	TC	SCPTICNS	
0174	REF	2	LAST 1108	43,3331	25 366 0	INCR	SCOUNT	
0175	REF	5	LAST 1277	43,3332	0 1371 0	TC	SKFEP1	CONTINUE WITH SELF-CHECK
0176	REF	1		43,3333	6 5650 1	SCPTICNS	AD	S-7
0177				43,3334	0 0 0 6	EXTEND		
0178				43,3335	6 2337 0	RZMF	+2	FOR OPTIONS BELOW NINE.
0179	REF	1		43,3336	0 2317 0	BNKOPTN	TC	SIDLOCP
0180	REF	3	LAST 1277	43,3337	25 366 0	INCR	SCOUNT	ILLEGAL OPTION. GO TO IDLE LOCP.
0181	REF	1		43,3340	6 4757 0	AD	S+7	FOR OPTIONS BELOW NINE.
0182	REF	383	LAST 1277	43,3341	5 0 0 1	INDEX	A	
0183	REF	1		43,3342	0 3343 0	TC	SCPTICN1	
0184	REF	6	LAST 1277	43,3343	0 1371 0	SCPTICN1	TC	SKFEP1
0185	REF	7	LAST 1277	43,3344	0 1371 0	SCPTICN2	TC	SKFEP1
0186	REF	8	LAST 1277	43,3345	0 1371 0	SCPTICN3	TC	SKFEP1
0187	REF	1		43,3346	0 2267 1	SCPTICN4	TC	FRASCHK
0188	REF	1		43,3347	0 3541 1	SCPTICN5	TC	RCPCHK
0189	REF	9	LAST 1277	43,3350	0 1371 0	SCPTICN6	TC	SKFEP1
0190	REF	10	LAST 1277	43,3351	0 1371 0	SCPTICN7	TC	SKFEP1
0191	REF	11	LAST 1277	43,3352	0 1371 0	SCPTICN10	TC	SKFEP1
0192				43,3353	0 0 0 6	CHKCKNJ	EXTEND	
0193	REF	7	LAST 1108	43,3354	23 361 1	QXCH	SELFRET	SAVE RETURN ADDRESS WHILE TESTING NEWJOB
0194	REF	56	LAST 1149	43,3355	0 4635 0	TC	POSTJUMP	TO SEE IF ANY JOBS HAVE BECOME ACTIVE.
0195	REF	2	LAST 1102	43,3356	0 3215 1	CADR	ADVAN	
0196	REF	2	LAST 1277	43,3357	0 3322 1	SELFCHK	TC	SMDECHK
0197								** CHARLEY, COME IN HERE
0197								
0198								
0199								
0200								
0201								

R0197 SKFEP7 HOLDS LOWEST OF TWO ADDRESSES BEING CHECKED.
 R0198 SKFEP6 HOLDS P(X+1).
 R0199 SKFEP5 HOLDS R(X).
 R2000 SKFEP4 HOLDS (EBANK) DURING FRASLOCP AND CHKCKNJ.
 R0201 SKFEP3 HOLDS LAST ADDRESS BEING CHECKED (HIGHEST ADDRESS).

L AGC BLOCK TWO SELF-CHECK

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R0202 SKEEP2 CONTROLS CHECKING OF NON-SWITCHABLE ERASABLE MEMORY WITH BANK NUMBERS IN EB.

R0204 EPASCHK TAKES APPROXIMATELY 7 SECONDS

0205	REF	2	LAST	291	43,3360	3 4753 1	EPASCHK	CA	S+1	
0206	REF	3	LAST	291	43,3361	55'372 1		TS	SKEEP2	
0207	REF	4	LAST	1276	43,3362	3 4755 1	ORBANK	CA	S+2REF	
0208	REF	66	LAST	1257	43,3363	54 003 0		TS	EBANK	
0209	REF	1			43,3364	3 3255 0		CA	EPASCCN3	C1461
0210	REF	4	LAST	1276	43,3365	55'377 1		TS	SKEEF7	STARTING ADDRESS
0211	REF	1			43,3366	3 5012 1		CA	S10BITS	01777
0212	REF	3	LAST	291	43,3367	55'373 0		TS	SKEEP3	LAST ADDRESS CHECKED
0213	REF	1			43,3370	0 3410 1		TC	ERASLCCF	

0214	REF	1			43,3371	3 5007 0	E134567B	CA	EPASCCN6	C1400
0215	REF	5	LAST	1278	43,3372	55'377 1		TS	SKEEP7	STARTING ADDRESS
0216	REF	2	LAST	1278	43,3373	3 5012 1		CA	S10BITS	01777
0217	REF	4	LAST	1278	43,3374	55'373 0		TS	SKEEP3	LAST ADDRESS CHECKED
0218	REF	2	LAST	1278	43,3375	0 3410 1		TC	ERASLCCF	

0219	REF	2	LAST	1278	43,3376	3 5007 0	2EBANK	CA	ERASCCN6	C1400
0220	REF	6	LAST	1278	43,3377	55'377 1		TS	SKEEP7	STARTING ADDRESS
0221	REF	1			43,3400	3 3256 0		CA	ERASCCN4	01773
0222	REF	5	LAST	1278	43,3401	55'373 0		TS	SKEEP3	LAST ADDRESS CHECKED
0223	REF	2	LAST	1278	43,3402	0 3410 1		TC	ERASLEOP	

0224	REF	4	LAST	1278	43,3403	55'372 1	NORBANK	TS	SKEEP2	+0
0225	REF	1			43,3404	3 3253 0		CA	ERASCCN1	00061
0226	REF	7	LAST	1278	43,3405	55'377 1		TS	SKEEF7	STARTING ADDRESS
0227	REF	1			43,3406	3 2254 1		CA	ERASCCN2	C1373
0228	REF	6	LAST	1278	43,3407	55'373 0		TS	SKEEF3	LAST ADDRESS CHECKED

0229					43,3410	0 0004 0	ERASLCCF	INHINT		
0230	REF	67	LAST	1278	43,3411	3 0003 1		CA	EBANK	STORES C(EBANK)
0231	REF	3	LAST	216	43,3412	55'374 1		TS	SKEEF4	
0232					43,3413	0 0006 1		EXTEND		
0233	REF	8	LAST	1278	43,3414	5 1377 0		NDX	SKEEP7	
0234					43,3415	2 0001 0		DCX	0000	
0235	REF	4	LAST	1276	43,3416	52'376 0		DXCH	SKEEF5	STORES C(X) AND C(X+1) IN SKEEF6 AND 5.
0236	REF	9	LAST	1278	43,3417	3 1377 0		CA	SKEEP7	
0237	REF	8	LAST	1276	43,3420	55'360 1		TS	ERFSTORE	IF RESTART, RESTORE C(X) AND C(X+1)
0238	REF	224	LAST	1120	43,3421	54 001 1		TS	L	
0239	REF	225	LAST	1278	43,3422	24 001 0		INCF	L	
0240	REF	384	LAST	1277	43,3423	50 000 1		NDX	A	
0241					43,3424	52 001 1		DXCF	0000	PUTS CWN ADDRESS IN X AND X +1
0242	REF	10	LAST	1278	43,3425	51'377 0		NDX	SKEEF7	
0243					43,3426	4 0001 1		CS	0001	C5 X+1
0244	REF	11	LAST	1278	43,3427	51'377 0		NDX	SKEEP7	
0245					43,3430	6 0000 1		AD	0000	AD X
0246	REF	1			43,3431	0 3314 1		TC	-1CHK	
0247	REF	9	LAST	1278	43,3432	3 1360 0		CA	ERFSTORE	HAS ERASABLE BEEN RESTORED
0248					43,3433	0 0006 1		EXTEND		

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0249	REF	1	43,3434	1 3463 1	BZF	ELCCPFIN	YES, EXIT ERASLOOP.
0250			43,3435	0 00 6 1	EXTEND		
0251	REF	12	43,3436	5 1377 0	NPX	SKEEP7	
0252			43,3437	4 00 1 1	DCS	0001	COMPLEMENT OF ADDRESS OF X AND X+1
0253	REF	13	43,3441	51 377 0	NDX	SKEEP7	
0254			43,3441	52 001 1	EXCH	0000	PUT COMPLEMENT OF ADDRESS OF X AND X+1
0255	REF	14	43,3442	51 377 0	NPX	SKEEP7	
0256			43,3443	4 000 0	CS	0000	CS X
0257	REF	15	43,3444	51 377 0	NPX	SKEEP7	
0258			43,3445	6 000 0	AD	0001	AD X+1
0259	REF	2	43,3446	0 3314 1	TC	-1CHK	
0260	REF	10	43,3447	3 1360 0	CA	ERESTORE	HAS FRASABLE BEEN RESTORED
0261			43,3451	0 0006 1	EXTEND		
0262	REF	2	43,3451	1 3463 1	BZF	FLOOPFIN	YES, EXIT ERASLOCP.
0263			43,3452	0 0006 1	EXTEND		
0264	REF	5	43,3453	3 1376 1	DCA	SKEEP5	
0265	REF	16	43,3454	51 377 0	NDX	SKEEP7	
0266			43,3455	52 001 1	EXCH	0000	PUT R(X) AND B(X+1) BACK INTO X AND X+1
0267	REF	5	43,3456	3 4755 1	CA	S+ZPDC	
0268	REF	11	43,3457	55 360 1	TS	ERESTORE	IF RESTART, DO NOT RESTORE C(X), C(X+1)
0269			43,3460	0 0002 1	FLOOPFIN	RELINT	
0271	REF	2	43,3461	0 3353 1	TC	CHECKNJ	CHECK FOR NEW JOB
0271	REF	4	43,3462	3 1374 0	CA	SKEEP4	REPLACES B(EPANK)
0272	REF	68	43,3463	54 003 0	TS	ERANK	
0273	REF	17	43,3464	25 377 0	INCP	SKEEP7	
0274	REF	18	43,3465	4 1377 1	CS	SKEEP7	
0275	REF	7	43,3466	6 1373 1	AD	SKEEP3	
0276			43,3467	0 0006 1	EXTEND		
0277			43,347	1 2472 1	BZF	+2	
0278	REF	4	43,3471	0 3410 1	TC	FRASLOOP	GO TO NEXT ADDRESS IN SAME BANK
0279	REF	5	43,3472	11 272 1	CCS	SKEEP2	
0280	REF	1	43,3473	0 3413 0	TC	NCFBANK	
0281	REF	6	43,3474	25 372 1	INCP	SKEEP2	PUT +1 IN SKEEP2.
0282	REF	69	43,3475	3 003 1	CA	EBANK	
0283	REF	1	43,3476	6 4743 0	AD	SBITS	
0284	REF	70	43,3477	54 003 0	TS	EBANK	
0285	REF	1	43,3510	6 2264 1	AD	ERASCCN5	76777, CHECK FOR BANK E2
0286			43,3511	0 0006 1	EXTEND		
0287	REF	1	43,3502	1 3376 1	BZF	2EBANK	
0288	REF	71	43,3503	10 003 0	CCS	EBANK	
0289	REF	1	43,3514	0 3371 1	TC	F1345678	GO TO EBANKS 1,3,4,5,6, AND 7
0290	REF	2	43,3505	3 5007 0	CA	ERASCCN6	END OF FRASCHK
0291	REF	72	43,3506	54 003 0	TS	EBANK	
R0292	CNTPOCK PERFORMS A CS OF ALL REGISTERS ERM OCT. 60 THROUGH OCT. 10.						
R0293	INCLUDED ARE ALL COUNTERS, T6-1, CYCLE AND SHIFT, AND ALL RPT REGISTERS						
0294	REF	1	43,3507	3 4771 1	CNTRCHK	CA	CNTRCCN
0295	REF	7	43,3510	55 372 1	CNTRLCCK	TS	SKEEP2
0296	REF	1	43,3511	6 4757 1	AD	SRIT4	+10 OCTAL
0297	REF	385	43,3512	50 003 1	INDEX	A	
0298			43,3513	4 0000 0	CS	0000	

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0299	REF	8	LAST	1275	43,3514	11'372 1	CCS	SKFFP2	
0300	REF	1			43,3515	0 3510 0	TC	CNTRLOCF	
R0301	CYCLESFT CHECKS THE CYCLE AND SHIFT REGISTERS								
0302	REF	1			43,3516	3 3262 1	CYCLSFST CA	CCNC+S1	25252
0303	REF	42	LAST	1083	43,3517	54 020 1	TS	CYR	C(CYR) = 12525
0304	REF	22	LAST	1073	43,3520	54 022 0	TS	CYL	C(CYL) = 52524
0305	REF	20	LAST	1073	43,3521	54 021 0	TS	SR	C(SR) = 12525
0306	REF	12	LAST	1257	43,3522	54 023 1	TS	EDOP	C(EDOP) = 00125
0307	REF	43	LAST	1280	43,3523	6 0020 0	AD	CYF	37777 C(CYR) = 45252
0308	REF	23	LAST	1280	43,3524	6 0022 1	AD	CYL	00-12524 C(CYL) = 25251
0309	REF	21	LAST	1280	43,3525	6 0021 1	AD	SR	00-25251 C(SR) = 05252
0310	REF	12	LAST	1280	43,3526	6 0023 0	AD	EDCP	00-25376 C(EDCP) = +C
0311	REF	1			43,3527	6 3262 0	AD	CCNC+S2	C(CCNC+S2) = 52400
0312	REF	3	LAST	1279	43,3530	0 3314 1	TC	-1CHK	
0313	REF	44	LAST	1280	43,3531	6 0020 0	AD	CYP	45252
0314	REF	24	LAST	1280	43,3532	6 0022 1	AD	CYL	72523
0315	REF	22	LAST	1280	43,3533	6 0021 1	AL	SR	77775
0316	REF	14	LAST	1280	43,3534	6 0023 0	AD	EDCP	77775
0317	REF	3	LAST	1278	43,3535	6 4753 1	AD	S+1	77776
0318	REF	4	LAST	1280	43,3536	0 3314 1	TC	-1CHK	
0319	REF	4	LAST	1277	43,3537	25'367 1	INCR	SCCLNT +1	
0320	REF	3	LAST	1277	43,3540	0 3322 1	TC	SMDECHK	
R0321	SKFFP1 HOLDS SUM								
R0322	SKFFP2 HOLDS PRESENT CONTENTS OF ADDRESS IN R0PECHK AND SHOWSUM ROUTINES								
R0323	SKFFP2 HOLDS BANK NUMBER IN LOW ORDER BITS DURING SHOWSUM DISPLAY								
R0324	SKFFP3 HOLDS PRESENT ADDRESS (0000 TO 01777 IN COMMON FIXED BANKS)								
R0325	(0411) TO 07777 IN FREE BANKS)								
R0326	SKFFP2 HOLDS RIGGER WORD DURING SHOWSUM DISPLAY								
R0327	SKFFP4 HOLDS BANK NUMBER AND SUPER BANK NUMBER								
R0328	SKFFP5 COUNTS 2 SUCCESSIVE TC SELF WORDS								
R0329	SKFFP6 CONTROLS R0PECHK OR SHOWSUM OPTION								
R0330	SKFFP7 CONTROLS WHEN ROUTINE IS IN COMMON FIXED OR FIXED FIXED BANKS								
0331	REF	1			43,3541	3 4754 0	R0PECHK CA	S-ZERO	*
03311	REF	4	LAST	292	43,3542	55'376 0	TS	SKFFP6	* -0 FCP R0PECHK.
03312	REF	6	LAST	1279	43,3543	3 4755 1	STSHQSUM CA	S+ZERO	* SHOULD BE R0PECHK
0332	REF	5	LAST	1275	43,3544	55'374 1	TS	SKFFP4	BANK NUMBER
0333	REF	4	LAST	1280	43,3545	2 4753 1	CA	S+1	
0334	REF	19	LAST	1275	43,3546	55'377 1	CCMMEX TS	SKFFP7	
0335	REF	7	LAST	1280	43,3547	3 4755 1	CA	S+ZERO	
0336	REF	12	LAST	1277	43,3550	55'371 1	TS	SKFFP1	
0337	REF	8	LAST	1275	43,3551	55'373 0	TS	SKFFP3	
0338	REF	5	LAST	1280	43,3552	2 4753 1	CA	S+1	
0339	REF	6	LAST	1279	43,3553	55'375 0	TS	SKFFP5	COUNTS DOWN 2 TC SELF WORDS
0340	REF	6	LAST	1280	43,3554	2 1374 0	CCNACRS CA	SKFFP4	
0341	REF	226	LAST	1278	43,3555	54 001 1	TS	L	TC SET SUPER BANK
0342	REF	8	LAST	1276	43,3556	7 4359 1	MASK	H15	

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0343	REF	9	LAST 1281	43,3557	6 1273 1	AD	SKIPF3	
0344	REF	2	LAST 442	43,3561	0 4651 1	TC	SUPRACAL	SUPER DATA CALL
0345	REF	1		43,3561	0 3604 0	TC	ADSUM	
0346	REF	1		43,3562	6 4741 1	AD	SBIT11	02000
0347	REF	1		43,3563	0 3615 0	TC	ADRSCHK	
0348	REF	386	LAST 1275	43,3564	4 001 0	FXFX	CS	A
0349	REF	20	LAST 1281	43,3565	551377 1	TS	SKIPF7	
0350				43,3566	0 0006 1		EXTEND	
0351				43,3567	1 3572 0	BZF	+3	
0352	REF	1		43,3570	3 4740 0	CA	SBIT12	04000, STARTING ADDRESS OF BANK 02
0353				43,3571	0 3573 0	TC	+2	
0354	REF	1		43,3572	3 5020 0	CA	SBKNC3	06000, STARTING ADDRESS OF BANK 03
0355	REF	10	LAST 1281	43,3573	551373 0	TS	SKIPF3	
0356	REF	8	LAST 1280	43,3574	3 4755 1	CA	S+ZERO	
0357	REF	13	LAST 1280	43,3575	551371 1	TS	SKIPF1	
0358	REF	6	LAST 1280	43,3576	3 4753 1	CA	S+1	
0359	REF	7	LAST 1280	43,3577	551375 0	TS	SKIPF5	COUNTS DOWN 2 TC SELF WORDS
0360	REF	11	LAST 1281	43,3600	511373 1	FXACRS	INDEX	SKIPF3
0361				43,3601	3 0000 0	CA	0000	
0362	REF	2	LAST 1281	43,3602	0 3604 0	TC	ADSUM	
0363	REF	2	LAST 1281	43,3603	0 3615 0	TC	ADRSCHK	
0364	REF	9	LAST 1280	43,3604	551372 1	ADSUM	TS	SKIPF2
0365	REF	14	LAST 1281	43,3605	6 1371 0	AD	SKIPF1	
0366	REF	15	LAST 1281	43,3606	551371 1	TS	SKIPF1	
0367	REF	9	LAST 1281	43,3607	3 4755 1	CAF	S+ZERO	
0368	REF	16	LAST 1281	43,3610	6 1371 0	AD	SKIPF1	
0369	REF	17	LAST 1281	43,3611	551371 1	TS	SKIPF1	
0370	REF	10	LAST 1281	43,3612	4 1372 1	CS	SKIPF2	
0371	REF	12	LAST 1281	43,3613	6 1373 1	AD	SKIPF3	
0372	REF	230	LAST 1277	43,3614	0 0002 0	TC	0	
0373	REF	387	LAST 1281	43,3615	22 0001 1	ADRSCHK	LXCH	A
0374	REF	13	LAST 1281	43,3616	3 1373 1	CA	SKIPF3	
0375	REF	21	LAST 1276	43,3617	7 5012 0	MASK	LCW10	RELATIVE ADDRESS
0376	REF	1		43,3620	6 4350 0	AD	-MAXADRS	SUBTRACT MAX RELATIVE ADDRESS = 1777.
0377				43,3621	0 0006 1		EXTEND	
0378	REF	1		43,3622	1 3711 1	BZF	SCPTION	CHECKSUM FINISHED IF LAST ADDRESS.
0379	REF	8	LAST 1281	43,3623	111375 0	CCS	SKIPF5	IS CHECKSUM FINISHED
0380				43,3624	0 3627 1	TC	+3	NO
0381				43,3625	0 3627 1	TC	+2	NO
0382	REF	2	LAST 1281	43,3626	0 3711 0	TC	SCPTION	CC TC REPECHK SHOWSUM OPTION
0383	REF	227	LAST 1280	43,3627	10 0001 1	CCS	L	-0 MEANS A TC SELF WORD.
0384	REF	1		43,3630	0 3637 0	TC	CONTINU	
0385	REF	2	LAST 1281	43,3631	0 3637 0	TC	CONTINU	
0386	REF	3	LAST 1281	43,3632	0 3637 0	TC	CONTINU	
0387	REF	5	LAST 1281	43,3633	111375 0	CCS	SKIPF5	
0388	REF	4	LAST 1281	43,3634	0 3640 0	TC	CONTINU +1	
0389	REF	1		43,3635	3 7752 0	CA	S-1	

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0390	REF	5	LAST 1281	43,3636	0 3640 0	TC	CONTINL +1	AD IN THE EUGGER WORD
0391	REF	7	LAST 1281	43,3637	3 4753 1	CONTINU	CA	MAKE SUPR TWO CONSECUTIVE TC SELF WORDS
0392	REF	10	LAST 1281	43,3640	55 375 0	TS	SKEEP5	
03921	REF	5	LAST 128	43,3641	11 376 0	CCS	SKEEP6	*
03922	REF	21	LAST 1108	43,3642	10 067 1	CCS	NEWJCB	* +1, SHOWSLM
03923	REF	4	LAST 717	43,3642	0 5122 0	TC	CHANG1	*
03924				43,3644	0 3646 0	TC	+2	*
0393	REF	3	LAST 1276	43,3645	0 3353 1	TC	CHECKNJ	-C IN SKEEP6 FOR ROPECHK
0394	REF	14	LAST 1281	43,3646	25 1273 1	AFRS+1	INCR	SKEEP3
0395	REF	21	LAST 1281	43,3647	11 377 1		CCS	SKEEP7
0396	REF	1		43,3650	0 3554 0		TC	CCMACRS
0397	REF	2	LAST 1282	43,3651	0 3554 0		TC	CCMACRS
0398	REF	1		43,3652	0 3600 1		TC	FXADRS
0399	REF	2	LAST 1282	43,3653	0 3600 1		TC	FXADRS
0400	REF	7	LAST 1280	43,3654	4 1374 1	NXTBNK	CS	SKEEP4
0401	REF	1		43,3655	6 3744 0		AD	LSTRNKCH
0402				43,3656	0 0006 1		EXTEND	LAST BANK TO BE CHECKED
0403	REF	1		43,3657	1 3146 0		BZF	ENDSLMS
0404	REF	8	LAST 1282	43,3660	3 1374 0		CA	SKEEP4
0405	REF	2	LAST 1281	43,3661	6 4741 1		AD	SBIT11
0406	REF	9	LAST 1282	43,3662	55 374 1		TS	SKEEP4
0407	REF	1		43,3663	0 3667 0		TC	CHKSUPR
0408	REF	1		43,3664	3 4735 1	17TO2C	CA	SBIT15
0409	REF	10	LAST 1282	43,3665	27 374 1		ADS	SKEEP4
0410	REF	1		43,3666	0 2732 0		TC	GCNXTBNK
0411	REF	9	LAST 1280	43,3667	7 4350 1	CHKSUPR	MASK	H15
0412				43,3670	0 0006 1		EXTEND	
0413	REF	1		43,3671	1 3771 0		BZF	NXTSLPR
0414	REF	1		43,3672	6 3261 1	27TO30	AD	S13BITS
0415				43,3673	0 0006 1		EXTEND	
0416				43,3674	1 3676 1		BZF	+2
0417	REF	2	LAST 1282	43,3675	0 3703 0		TC	GCNXTBNK
0418	REF	1		43,3676	3 3257 1		CA	SIXTY
0419	REF	11	LAST 1282	43,3677	27 374 1		ADS	SKEEP4
0420	REF	3	LAST 1282	43,3700	0 3713 0		TC	GCNXTBNK
0421	REF	1		43,3701	6 3260 0	NXTSLPR	AD	SLPRCCN
0422	REF	12	LAST 1282	43,3702	27 374 1		ADS	SKEEP4
0423	REF	22	LAST 1282	43,3703	11 377 1	GCNXTBNK	CCS	SKEEP7
0424	REF	1		43,3704	0 3546 0		TC	CCMMFX
0425	REF	8	LAST 1282	43,3705	3 4753 1		CA	S+1
0426	REF	1		43,3706	0 3564 0		TC	FXFX
0427	REF	1		43,3707	0 3745 0		CA	SBIT7
0428	REF	2	LAST 1282	43,3710	0 3546 0		TC	CCMMFX
0429	REF	13	LAST 1282	43,3711	3 1374 0	SOPTION	CA	SKEEP4
0430	REF	10	LAST 1282	43,3712	7 4350 1		MASK	H15
0431	REF	5	LAST 436	43,3713	0 4331 1		TC	LEFT5
0432	REF	228	LAST 1281	43,3714	54 001 1		TS	L

END OF SUMMING OF BANKS.

27 TO 40 INCPMIS SKEEP4 BY END RND CARRY

SET FOR BANK 21

INCREMENT SUPER BANK

BANK SET FOR 30

FIRST SUPER BANK

SET BAK 30 + INCR SUPR BNK AND CANCEL ERC BIT OF THE 37 TO 40 ADVANCE.

HAS TO BE LARGER THAN NO OF FXSW BANKS.

= BANK BITS

BANK NUMBER BEFORE SUPER BANK

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0433	REF	14	LAST 1282	43,3715	3 1374 0	CA	SKFFP4	
0434	REF	1		43,3716	7 4357 0	MASK	S8BITS	= SUPER BANK BITS
0435				43,3717	0 0006 1	EXTEND		
0436	REF	1		43,3720	1 3726 0	RZF	SOFT	BEFORE SUPER BANK
0437	REF	23	LAST 1280	43,3721	54 021 0	TS	SR	SUPER BANK NECESSARY
0438	REF	229	LAST 1282	43,3722	3 0001 0	CA	L	
0439	REF	18	LAST 1276	43,3723	7 4757 1	MASK	SEVEN	
0440	REF	24	LAST 1283	43,3724	6 0021 1	AD	SR	
0441	REF	230	LAST 1283	43,3725	54 001 1	TS	L	BANK NUMBER WITH SUPER BANK
0442	REF	6	LAST 1282	43,3726	3 1376 1	CA	SKFFP6	*
0443				43,3727	0 0006 1	EXTEND		*
0444				43,3730	1 3732 0	RZF	+2	* CN -0 CONTINUE WITH ROPE CHECK.
0445	REF	1		43,3731	0 3130 0	TC	SDISPLAY	* CN +1 GO TO DISPLAY OF SLN.
0446	REF	18	LAST 1281	43,3732	11 0271 1	CCS	SKFFP1	FORCE SUM TO ABSOLUTE VALUE.
04461				43,3733	0 3735 0	TC	+2	
04462				43,3734	0 3736 0	TC	+2	
04463	REF	9	LAST 1282	43,3735	6 4753 1	AD	S+1	
04464	REF	19	LAST 1282	43,3736	55 0371 1	TS	SKFFP1	
0447	REF	231	LAST 1283	43,3737	4 0001 1	CS	L	= - BANK NUMBER
0448	REF	20	LAST 1282	43,3740	6 1371 0	AD	SKFFP1	
0449	REF	2	LAST 1281	43,3741	6 7752 0	AD	S-1	
0450	REF	5	LAST 1280	43,3742	0 3314 1	TC	-1CHK	CHECK SUM
0451	REF	2	LAST 1281	43,3743	0 3654 0	TC	NXTBANK	
0454	REF	22	LAST 1282	0067			EBANK= NEWJOB	
0455				43,3744	66100 0	LSTBANKCH	BCCCN*	* CONSTANT, LAST BANK.

L PHASE TABLE MAINTENANCE

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P0001 SUBROUTINE TO UPDATE THE PROGRAM NUMBER DISPLAY ON THE DSKY.

0002	REF	1				COUNT*	\$/PHASE		
0003				5311		BLOCK	02		
0004	REF	1		4000		SETLCC	FFTAG1		
0005				5311		BANK			
0006	REF	331	LAST 1281	5311	50 002 0	NEWMCDEX	INDEX	0	UPDATE MCDREG. ENTRY FOR MODE IN FIXED.
0007				5312	3 0000 0		CAF	0	
0008	REF	332	LAST 1284	5313	24 002 0		INCR	0	
0009	REF	20	LAST 1222	5314	55 010 0	NEWMCDEX	IS	MCDREG	ENTRY FOR MODE IN A.
0014				5315	3 5320 0	MMDSPLAY	CAF	+3	DISPLAY MAJOR MODE.
0015	REF	40	LAST 1204	5316	22 006 1	PREJUMP	EXCH	BBANK	PUTS BBANK IN L
0016	REF	16	LAST 1215	5317	1 4640 0		TCF	BANKJUMP	PUTS G INTO A
0017	REF	1		5320	20213 0		CADR	SETUPDSP	

R0018 RETURN TO CALLER +3 IF MODE = THAT AT CALLER +1. OTHERWISE RETURN TO CALLER +2.

0021	REF	333	LAST 1284	5321	51 002 0	CHECKMM	INDEX	0	
0021				5322	4 0000 0		CS	0	
0022	REF	21	LAST 1284	5323	6 1110 1		AD	MCDREG	
0023				5324	0 0006 1		EXTEND		
0024	REF	2	LAST 1097	5325	1 6744 1		EZF	Q+2	
0025	REF	5	LAST 089	5326	1 6742 1		TCF	G+1	NO MATCH
0026	REF	4	LAST 1284	6745		TCG	=	Q+2 +1	
0027				14,2775			BANK	14	
0028	REF	1		14,2700			SETLCC	PHASETAB	
0029				10,2213			BANK		
0030	REF	1					CCLNT*	\$/PHASE	
0031				10,2213	1 0004 0	SETUPDSP	INHINT		
0032	REF	46	LAST 085	10,2214	52 071 0		EXCH	RUPTRPG1	SAVE CALLER-S RETURN 2CADD
0033	REF	11	LAST 1091	1,2215	3 4355 0		CAF	PRIC30	EITHER A TASK OR JOE CAN COME TO
0034	REF	26	LAST 1113	10,2216	0 5072 1		TC	NOVAC	NEWMCDEX
0035	REF	22	LAST 12F4	1110			EBANK=	MCDREG	
0036	REF	1		10,2217	02577 1		2CADR	DSPMMJCR	
0036	REF	1		10,2220	61102 1				
0037	REF	47	LAST 1284	10,2221	52 071 0		EXCH	RUPTRPG1	
0038				10,2222	0 0013 1		RELINT		
0039	REF	23	LAST 1257	10,2223	52 006 0		EXCH	Z	RETURN
0040	REF	2	LAST 459	40,3577			DSPMMJCR	EQUALS DSPMMJB	
0041				5327			BLOCK	02	
0042	REF	2	LAST 1284	4000			SETLCC	FFTAG1	
0043				5327			BANK		

L PHASE TABLE MAINTENANCE

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R0044 PHASCHNG IS THE MAIN WAY OF MAKING PHASE CHANGES FOR RESTARTS. THERE ARE THREE FORMS OF PHASCHNG, KNOWN AS TYPE
R0046 A, TYPE B, AND TYPE C. THEY ARE ALL CALLED AS FOLLOWS, WHERE OCT XXXXX CONTAINS THE PHASE INFORMATION,

AGC48 TC PHASCHNG
AJC49 OCT XXXXX

R0050 TYPE A IS CONCERNED WITH FIXED PHASE CHANGES, THAT IS, PHASE INFORMATION THAT IS STORED PERMANENTLY. THESE
R0052 OPTIONS ARE, WHERE G STANDS FOR A GROUP AND .X FOR THE PHASE,

R0053 G.0 INACTIVE, WILL NOT PERMIT A GROUP G RESTART
R0055 G.1 WILL CAUSE THE LAST DISPLAY TO BE REACTIVATED, USED MAINLY IN MANNED FLIGHTS
R0057 G.EVEN A DOUBLE TABLE RESTART, CAN CAUSE ANY COMBINATION OF TWO JOBS, TASKS, AND/OR
R0059 LONGCALL TO BE RESTARTED.
R0060 G.OCC NOT .1 A SINGLE TABLE RESTART, CAN CAUSE EITHER A JOB, TASK, OR LONGCALL RESTART

R0062 THIS INFORMATION IS PUT INTO THE OCTAL WORD AFTER TC PHASCHNG AS FOLLOWS

R0063 TLO ODP PPP PPP GGG

R0065 WHERE EACH LETTER OR NUMBER STANDS FOR A BIT. THE G'S STAND FOR THE GROUP, OCTAL 1 - 7, THE P'S FOR THE PHASE,
R0067 OCTAL 0 - 127. O'S MUST BE 0. IF ONE WISHES TO HAVE THE TBASE OF GROUP G TO BE SET AT THIS TIME,
R0069 T IS SET TO 1, OTHERWISE IT IS SET TO 0. SIMILARLY IF ONE WISHES TO SET LONGBASE, THEN L IS SET TO 1, OTHERWISE
R0071 IT IS SET TO 0. SOME EXAMPLES,

A0072	TC	PHASCHNG	THIS WILL CAUSE GROUP 3 TO BE SET TO 0,
A0073	OCT	00003	MAKING GROUP 3 INACTIVE
A0074	TC	PHASCHNG	IF A RESTART OCCURS THIS WOULD CAUSE
A0075	OCT	00012	GROUP 2 TO RESTART THE LAST DISPLAY
A0076	TC	PHASCHNG	THIS SETS THE TBASE OF GROUP 4 AND IN
A0077	OCT	40064	CASE OF A RESTART WOULD START UP THE TWO
A0078			THINGS LOCATED IN THE DOUBLE 4.6 RESTART
A0079			LOCATION
A0080	TC	PHASCHNG	THIS SETS LONGBASE AND UPON A RESTART
A0081	OCT	20135	CAUSES 5.13 TO BE RESTARTED (SINCE
A0082			LONGBASE WAS SET THIS SINGLE ENTRY
A0083			SHOULD BE A LONGCALL)
A0084	TC	PHASCHNG	SINCE BOTH TBASE4 AND LONGBASE ARE SET,
A0085	OCT	60124	4.12 SHOULD CONTAIN BOTH A TASK AND A
A0086			LONGCALL TO BE RESTARTED

R0087 TYPE C PHASCHNG CONTAINS THE VARIABLE TYPE OF PHASCHNG INFORMATION. INSTEAD OF THE INFORMATION BEING IN A
R0089 PERMANENT FORM, ONE STORES THE DESIRED RESTART INFORMATION IN A VARIABLE LOCATION. THE BITS ARE AS FOLLOWS,

R0091 TLO IAD XXX C.W GGG

R0092 WHERE EACH LETTER OR NUMBER STANDS FOR A BIT. THE G'S STAND FOR THE GROUP, OCTAL 1 - 7. IF THE RESTART IS TO
R0094 BE BY WAITLIST, W IS SET TO 1, IF IT IS A JOB, J IS SET TO 1, IF IT IS A LONGCALL, C IS SET TO 1. ONLY ONE OF
R0096 THESE THREE BITS MAY BE SET. X'S ARE IGNORED. 1 MUST BE 1, AND 0 MUST BE 0. AGAIN T STANDS FOR THE TBASE,

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R0098 AND L FOR LONGPASC. THE BITS A AND C ARE CONCERNED WITH THE VARIABLE INFORMATION. IF D IS SET TO 1, A PRIORITY
 R0100 OF DELTA TIME WILL BE READ FROM THE NEXT LOCATION AFTER THE CCTAL INFORMATION. IF THIS IS TO BE INDIRECT, THAT
 R0102 IS, THE NAME OF A LOCATION CONTAINING THE INFORMATION (DELTA TIME ONLY), THEN THIS IS GIVEN AS THE -GENADR OF
 R0104 THAT LOCATION WHICH CONTAINS THE DELTA TIME. IF THE OLD PRIORITY OF DELTA TIME IS TO BE USED, THAT WHICH IS
 R0106 ALREADY IN THE VARIABLE STORAGE, THEN C IS SET TO 0. NEXT THE A BIT IS USED. IF IT IS SET TO 0, THE ADDRESS
 R0108 THAT WOULD BE RESTARTED DURING A RESTART IS THE NEXT LOCATION AFTER THE PHASE INFORMATION, THAT IS, EITHER
 R0110 (TC PHASCHNG) +2 OR +3, DEPENDING ON WHETHER C HAD BEEN SET OR NOT. IF A IS SET TO 1, THEN THE ADDRESS THAT
 R0112 WOULD BE RESTARTED IS THE 2CADR THAT IS READ FROM THE NEXT TWO LOCATIONS. EXAMPLES,

A0114	AC	TC	PHASCHNG	THIS WOULD CAUSE LOCATION AD +3 TO BE
A0115	AC+1	CCT	05123	RESTARTED BY GROUP THREE WITH A PRIORITY
A0116	AC+2	CCT	23000	OF 23. NOTE UPON RETURNING IT WOULD
A0117	AC+3			ALSO GO TO AC+3
A0118	AC	TC	PHASCHNG	GROUP 1 WOULD CAUSE CALLCALL TO
A0119	AC+1	CCT	27441	BE STARTED AS A LONGCALL FROM THE TIME
A0120	AC+2	-GENADR	DELTIME	STORED IN LONGEASE (LONGEASE WAS SET) BY
A0121	AC+3	2CADR	CALLCALL	A DELTATIME STORED IN DELTIME. THE
A0122	AC+4			BEGIN OF THE 2CADR SHOULD CONTAIN THE E
A0123	AC+5			BANK OF DELTIME. PHASCHNG RETURNS TO
A0124				LOCATION AD+5

R0125 NOTE THAT IF A VARIABLE PRIORITY IS GIVEN FOR A JOB, THE JOB WILL BE RESTARTED AS A NCVAC IF THE PRIORITY IS
 R0127 NEGATIVE, AS A FINVAC IF THE PRIORITY IS POSITIVE.

R0128 TYPE B PHASCHNG IS A COMBINATION OF VARIABLE AND FIXED PHASE CHANGES. IT WILL START UP A JOB AS INDICATED
 R0130 BELOW AND ALSO START UP THE FIXED RESTART, THAT IS EITHER AN G.1 OR A G.CCD OR THE FIRST ENTRY OF G.EVEN
 R0132 DOUBLE ENTRY. THE BIT INFORMATION IS AS FOLLOWS,

P0133 TLL DAP PPP PPP GGG

R0134 WHERE EACH LETTER OR NUMBER STANDS FOR A BIT. THE G:S STAND FOR THE GROUP, OCTAL 1 - 7. THE P:S FOR THE FIXED
 R0136 PHASE INFORMATION, OCTAL 0 - 127. 1 MUST BE 1. AND AGAIN T STANDS FOR THE TBASE AND L FOR LONGEASE. C THIS
 R0138 TIME STANDS ONLY FOR PRIORITY SINCE THIS WILL BE CONSIDERED A JOB, AND IT MUST BE GIVEN DIRECTLY IF GIVEN.
 R0140 AGAIN A STANDS FOR THE ADDRESS OF THE LOCATION TO BE RESTARTED, 1 IF THE 2CADR IS GIVEN, OR 2 IF IT IS TO BE
 R0142 THE NEXT LOCATION. (THE RETURN LOCATION OF PHASCHNG) EXAMPLES,

A0143	AC	TC	PHASCHNG	TRASL IS SET AND RESTART CAUSE GROUP 3
A0144	AC+1	CCT	56143	TO START THE JOB AJOBAJOB WITH PRIORITY
A0145	AC+2	CCT	31000	31 AND THE FIRST ENTRY OF 3.4SPCT (WE CAN
A0146	AC+3	2CADR	AJOBAJOB	ASSUME IT IS A TASK SINCE WE SET TBASE3)
A0147	AC+4			UPON RETURN FROM PHASCHNG CONTROL WOULD
A0148	AD+5			GO TO AC+5
A0149				
A0149	AC	TC	PHASCHNG	UPON A RESTART THE LAST DISPLAY WOULD BE
A0150	AD+1	CCT	10015	RESTARTED AND A JOB WITH THE PREVIOUSLY
A0151	AD+2			STORED PRIORITY WOULD BE BEGIN AT AC+2
A0152				BY MEANS OF GROUP 5

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R0153 THE MOVAC-FINDVAC CHOICE FOR JCES FOLDS HERE ALSO - NEGATIVE PRIORITY CAUSES A MOVAC CALL, POSITIVE A FINDVAC.

R0155 SUMMARY OF BITS

R0156 TYPE A TLO DAP PPP PPP GGG

R0157 TYPE B TL1 DAP PPP PPP GGG

R0158 TYPE C TLC LAD XXX GJK GGG

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R0159 2PHSCHNG IS USED WHEN ONE WISHES TO START UP A GROUP OR CHANGE A GROUP WHILE UNDER THE CONTROL OF A DIFFERENT
 R0161 GROUP. FOR EXAMPLE, CHANGE THE PHASE OF GROUP 3 WHILE THE PORTION OF THE PROGRAM IS UNDER GROUP 5. ALL 2PHSCHNG
 R0163 CALLS ARE MADE IN THE FOLLOWING MANNER,

A0164	TC	2PHSCHNG
A0165	CCT	XXXXX
A0166	CCT	YYYYY

R0167 WHERE CCT XXXXX MUST BE OF TYPE A AND CCT YYYYY MAY BE OF EITHER TYPE A OR TYPE B OR TYPE C. THERE IS ONE
 R0169 DIFFERENCE --- NOTE- IF LONGBASE IS TO BE SET THIS INFORMATION IS GIVEN IN THE CCT YYYYY INFORMATION, IT WILL
 R0171 BE DISREGARDED IF GIVEN WITH THE CCT XXXXX INFORMATION. A COUPLE OF EXAMPLES MAY HELP,

A0173	AC	TC	2PHSCHNG	SET TBASE3 AND IF A RESTART OCCURS START
A0174	AD+1	CCT	40083	THE TWO ENTRIES IN 3.8 TABLE LOCATION
A0175	AD+2	CCT	05025	THIS IS OF TYPE C, SET THE JOB TO BE
A0176	AD+3	CCT	18000	TO BE LOCATION AD+4, WITH A PRIORITY 18,
A0177	AD+4			FOR GROUP 5 PHASE INFORMATION

0178	REF	1		5327	0 0004 0	2PHSCHNG	COUNT# 11/PHASE	
0179				5330	50 002 0	ININT		THE ENTRY FOR A DOUBLE PHASE CHANGE
0180	REF	334	LAST 1284	5331	3 0000 1	NDX	Q	
0181				5332	24 002 0	CA	Q	
0182	REF	335	LAST 1285	5333	54 072 0	INCR	Q	
0183	REF	1				TS	TEMPF2	
0184	REF	1		5334	7 4757 1	MASK	CCT7	
0185				5335	6 0000 1	DOUBLE		
0186	REF	1		5336	54 071 0	TS	TEMPC2	
0187	REF	2	LAST 1286	5337	3 0072 1	CA	TEMPF2	
0188	REF	1		5340	7 5030 0	MASK	OCT1777	NEED ONLY 1770, BUT WHY GET A NEW CCNST.
0189				5341	0 0006 1	EXTEND		
0190	REF	32	LAST 1275	5342	7 4740 1	MP	BIT12	
0191	REF	3	LAST 1288	5343	56 072 1	XCH	TEMPF2	
0192	REF	43	LAST 1275	5344	7 4735 0	MASK	BIT15	
0193	REF	1		5345	54 066 0	TS	TEMPSW2	INDICATES WHETHER TO SET TBASE OR NOT
01932	REF	336	LAST 1288	5346	50 002 0	INDEX	Q	
01934				5347	3 0000 1	CA	Q	
01936	REF	337	LAST 1288	5350	24 002 0	INCR	Q	
01938	REF	1		5351	54 065 0	TS	TEMPSW	
0194	REF	1		5352	1 5263 0	TCF	PHASJUMP	
0195				5353	0 0004 0	PHASCHNG	ININT	NORMAL PHASCHNG ENTRY POINT.
0196	REF	338	LAST 1288	5354	50 002 0	INDEX	Q	
0197				5355	3 0000 1	CA	Q	
0198	REF	339	LAST 1288	5356	24 002 0	INCR	Q	
0199				5357	0 0004 0	PHASCHNG	ININT	FIRST CCTAL PARAMETER IN A.

L PHASE TABLE MAINTENANCE

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0200	REF	2	LAST 1288	5360	54 065 0	TS	TEMPSW
0201	REF	127	LAST 1288	5361	3 4753 1	CA	CM
02015	REF	2	LAST 1288	5362	54 066 0	TS	TEMPSW2
0202				5363	0 0006 1	PHASJUMP	EXTEND
0203	REF	1		5364	3 5367 0	DCA	ADRPCN2
0204				5365	52 006 0	CTCB	

OFF TO SWITCHED BANK

0205	REF	47	LAST 1276	5314	0	EBANK=	LST1
0206	REF	1		5366	12224 1	ADRPCN2	2CAOR
0206	REF	1		5367	2 0113 1		PHSCHNG2

0207	REF	1		5370	22 073 0	CMFCRTWC	LXCH
0208	REF	41	LAST 1284	5371	22 006 1		LXCH
0209	REF	2	LAST 1289	5372	22 073 0		LXCH

0210	REF	1		5373	7 5024 0	MASK	DCT14 10
0211	REF	388	LAST 1281	5374	10 071 0	CCS	A
0212	REF	1		5375	1 7753 0	TCF	CHECKE

SEE WHAT KIND OF PHASE CHANGE IT IS

IT IS OF TYPE :P:

0213	REF	1		5376	3 0062 0	CA	TEMPP
0214	REF	41	LAST 1275	5377	7 4745 1	MASK	BIT7
0215	REF	389	LAST 1289	5400	10 000 0	CCS	A
0216	REF	1		5401	1 5423 0	TCF	GETPRIO

SHALL WE USE THE OLD PRIORITY
NO GET A NEW PRIORITY (OR DELTA T)

0217	REF	1		5402	50 061 0	CLEPRIO	NCX
0218	REF	1		5403	3 1051 1	CA	PHSPRDT1 -2
0219	REF	1		5404	54 070 1	TS	TEMPPR

USE THE OLD PRIORITY (OR DELTA T)

0220	REF	2	LAST 1285	5405	3 0062 0	CCN1	CA
0221	REF	39	LAST 1275	5406	7 4744 0		MASK
0222	REF	390	LAST 1289	5407	10 000 0		CCS
0223	REF	1		5410	1 5427 1	TCF	GETNEWNM

SEE IF A 2CAOR IS GIVEN

0224	REF	340	LAST 1288	5411	3 0002 0	CA	Q
0225	REF	1		5412	54 063 0	TS	TEMPAM
0226	REF	1		5413	3 0006 1	CA	BR
0227				5414	0 0006 1	EXTEND	
0228	REF	24	LAST 1121	5415	04 007 1	PCR	SUPERENK
0229	REF	1		5416	54 064 1	TS	TEMPPR

PICK LF USERS SUPERBANK

0230	REF	1		5417	3 5422 0	TCCCN2	CA
0231	REF	3	LAST 1285	5420	22 073 0		LXCH
0232				5421	52 006 0		CTCB

BACK TO SWITCHED BANK

0233	REF	1		5422	02312 0	CCN2ACR	CFNACR
							CCN2

0234	REF	341	LAST 1289	5423	50 072 0	GETPRIO	NDX
0235				5424	3 0000 1		CA
0236	REF	342	LAST 1289	5425	24 002 0		INCR

DON'T CARE IF DIRECT OR INDIRECT
LEAVE THAT DECISION TO PESTARTS
OBTAIN RETURN ADDRESS

I PHASE TABLE MAINTENANCE

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0237	RFF	1		5426	1	5404	0	TCF	CCN1 -1
0238				5427	0	0006	1	GETNEWNM	EXTEND
0239	RFF	343	LAST 1289	5430	5	0002	0	INDEX	Q
0240				5431	3	0001	0	CCA	0
0241	RFF	2	LAST 1285	5432	52	0064	1	EXCH	TEMPAN
0242	RFF	79	LAST 1123	5433	3	4752	0	CA	TWO
0243	RFF	344	LAST 1290	5434	26	002	1	ACS	Q
0244	RFF	1		5435	1	5417	1	TCF	TCCON2
0245	RFF	2	LAST 505	5424				OCT14000	EQUALS PPIC14
0246	RFF	40	LAST 1251	5461				TEMPG	EQUALS ITEMF1
0247	RFF	20	LAST 1251	5462				TEMPP	EQUALS ITEMF2
0248	RFF	25	LAST 856	5463				TEMPAN	EQUALS ITEMF3
0249	RFF	13	LAST 856	5464				TEMPBB	EQUALS ITEMF4
0250	RFF	50	LAST 900	5465				TEMPSW	EQUALS ITEMF5
0251	RFF	7	LAST 858	5466				TEMPSW2	EQUALS ITEMF6
0252	RFF	48	LAST 1284	5474				TEMPPR	EQUALS RLPTREG1
0253	RFF	9	LAST 811	5471				TEMPG2	EQUALS RLPTREG2
0254	RFF	12	LAST 852	5472				TEMPP2	EQUALS RLPTREG3
0255	RFF	5	LAST 992	5473				TEMPBBON	EQUALS RLPTREG4
0256	RFF	42	LAST 1285	5406				BE	EQUALS BRANK
0257				14,3775				BANK	14
0258	RFF	2	LAST 1284	10,2200				SETLCC	PHASETAB
0259				10,2224				BANK	
0260	RFF	1		53,1436				EBANK=	PHSNAME1
0261	RFF	2	LAST 1284 TC	1289:	9	9*		CCOUNT#	11/PHASE
0262	RFF	4	LAST 1289	10,2224	22	073	0	PHSCHNG2	LXCH
0263	RFF	3	LAST 1289	10,2225	3	0065	1	CA	TEMPSW
0264	RFF	2	LAST 1288	10,2226	7	4757	1	MASK	OCT7
0265				10,2227	6	0000	1	DOUBLE	
0266	RFF	2	LAST 1289	10,2230	54	061	1	TS	TEMPG
0267	RFF	4	LAST 1290	10,2231	3	0065	1	CA	TEMPSW
0268	RFF	2	LAST 1288	10,2232	7	5030	0	MASK	OCT17770
0269				10,2233	0	0006	1	EXTEND	
0270	RFF	23	LAST 1288	10,2234	7	4740	1	MP	BIT12
0271	RFF	3	LAST 1289	10,2235	54	062	1	TS	TEMPP
0272	RFF	5	LAST 1290	10,2236	3	0065	1	CA	TEMPSW
0273	RFF	1		10,2237	7	4101	1	MASK	OCT160000
0274	RFF	6	LAST 1290	10,2240	56	065	1	XCH	TEMPSW
0275	RFF	2	LAST 1289	10,2241	7	5024	0	MASK	OCT140000
0276	RFF	391	LAST 1289	10,2242	10	000	0	CCS	A

CAPTAIN RETURN ADDRESS

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0277	REF	1		1,2243	1 5370 1	TCF	CNECRTWC		
0278	REF	4	LAST 1290	1,2244	3 0062 0	CA	TEMPP	START STORING THE PHASE INFORMATION	
0279	REF	3	LAST 1291	1,2245	50 061 0	NDX	TEMPP		
0280	REF	2	LAST 1218	1,2246	54 750 1	TS	PHASE1 -2		
0281	REF	3	LAST 1289	1,2247	10 066 0	BELOW1	CCS	TEMPSW2	IS IT A PHASCHNG OR A 2PHSCHNG
0282	REF	1		1,2248	1 2244 1	TCF	BELCW2	IT'S A PHASCHNG	
0283				1,2251	1 2252 1	TCF	+1	IT'S A 2PHSCHNG	
0284	REF	4	LAST 1288	1,2252	4 0072 0	CS	TEMPP2		
0285	REF	5	LAST 1291	1,2253	22 072 1	LXCH	TEMPP2		
0286	REF	2	LAST 1288	1,2254	50 071 1	NDX	TEMPP2		
0287	REF	5	LAST 860	1,2255	52 750 1	EXCH	-PHASE1 -2		
0288	REF	4	LAST 1291	1,2256	1 066 0	CCS	TEMPSW2		
0289				1,2257	12 260 0	NDX		CAN'T GET HERE	
0290	REF	2	LAST 1291	1,2260	1 2244 1	TCF	BELCW2		
0291	REF	17	LAST 989	1,2261	4 0025 1	CS	TIME1		
0292	REF	3	LAST 1291	1,2262	50 071 1	NDX	TEMPP2		
0293	REF	2	LAST 728	1,2263	55 050 1	TS	TRASE1 -2		
0294	REF	7	LAST 1290	1,2264	10 065 0	BELOW2	CCS	TEMPSW	SEE IF WE SHOULD SET TRASE OR LONGBASE
0295	REF	1		1,2265	1 2300 1	TCF	BELCW3	SET LONGBASE ONLY	
0296	REF	1		1,2266	1 2303 1	TCF	BELCW4	SET NEITHER	
0297	REF	18	LAST 1291	1,2267	4 0025 1	CS	TIME1	SET TRASE TO BEGIN WITH	
0298	REF	4	LAST 1291	1,2270	50 061 0	NDX	TEMPP		
0299	REF	3	LAST 1291	1,2271	55 050 1	TS	TRASE1 -2		
0300	REF	8	LAST 1291	1,2272	3 0065 1	CA	TEMPSW	SHALL WE NOW SET LONGBASE	
0301	REF	1		1,2273	6 2276 0	AD	BIT14COM		
0302	REF	352	LAST 1290	1,2274	10 010 0	CCS	A		
0303				1,2275	12 276 1	NDX		***** CAN'T GET HERE *****	
0304				1,2276	17777 1	BIT14COM	17777	***** CAN'T GET HERE *****	
0305	REF	2	LAST 1291	1,2277	1 2303 1	TCF	BELCW4	NO WE NEED ONLY SET TRASE	
0306				1,2300	0 0006 1	BELOW3	EXTEND	SET LONGBASE	
0307	REF	31	LAST 1215	1,2301	3 0025 0	CCA	TIME2		
0308	REF	1		1,2302	53 051 1	EXCH	LONGBASE		
0309	REF	5	LAST 1291	1,2303	4 0062 1	BELOW4	CS	TEMPP	AND STORE THE FINAL PART OF THE PHASE
0310	REF	5	LAST 1291	1,2304	50 061 0	NDX	TEMPP		
0311	REF	6	LAST 1291	1,2305	54 747 1	TS	-PHASE1 -2		
0312	REF	345	LAST 1290	1,2306	3 0012 0	CA	Q		
0313	REF	5	LAST 1290	1,2307	22 073 0	LXCH	TEMPRCN		
0314				1,2310	0 0003 1	REFL1			
0315				1,2311	52 006 0	CTCB			

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0316	REF	6	LAST 1291	10,2312	22 073 0	CCN2	LXCF	TEMPPECN
0317	REF	6	LAST 1291	10,2313	3 0062 0		CA	TEMPP
0318	REF	6	LAST 1291	10,2314	50 061 0		NDX	TEMPG
0319	REF	3	LAST 1291	10,2315	54 750 1		TS	PHASE1 -2
0320	REF	2	LAST 1289	10,2316	3 0070 0		CA	TEMPPR
0321	REF	7	LAST 1292	10,2317	50 061 0		NDX	TEMPG
0322	REF	2	LAST 1289	10,2320	55 051 0		TS	PHSPRDT1 -2
0323				10,2321	0 0006 1		EXTEND	
0324	REF	3	LAST 1290	10,2322	2 0064 0		CCA	TEMPNM
0325	REF	8	LAST 1292	10,2323	50 061 0		NDX	TEMPG
0326	REF	2	LAST 1290	10,2324	53 435 0		EXCF	PHSNAME1 -2
0327	REF	1		10,2325	1 2247 0		TCF	BELOW1
0328				7753			RLCK	03
0329	REF	4	LAST 743	6 00			SETLCC	FFTAG6
0330				7753			BANK	
0331	REF	1					CUAT*	44/PHASE
0332	REF	34	LAST 1290	7753	7 4740 1	CHECKB	MASK	BIT12
0333	REF	393	LAST 1291	7754	10 000 0		CCS	A
0334	REF	2	LAST 1289	7755	1 5423 0		TCF	GFTPRIO
0335	REF	1		7756	1 5422 0		TCF	OLDPRIO

SINCE THIS IS OF TYPE E, THIS BIT SHOULD
BE HERE IF WE ARE TO GET A NEW PRIORITY
IT IS, SO GET NEW PRIORITY

IT ISN'T, USE THE OLD PRIORITY

L RESTARTS ROUTINE

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0001				01,3527		BANK 01		
0002	REF	2	LAST	239	01,3527	SETLCC	RESTART	
0003				01,3527		BANK		
0004	REF	3	LAST	1292	03,1436	EBANK=	PHSNAME1	GORRUG MUST SWITCH TO THIS BANK
0005	REF	1				COUNT*	\$/RSROU	
0006	REF	778	LAST	1257	01,3527 3 0161 1	RESTARTS	CA MFAC +5	GET GROUP NUMBER -1
0007					01,3530 6 0000 1		DOUBLE	SAVE FOR INDEXING
0008	REF	1			01,3531 54 155 1		TS	TEMP2C
0009	REF	1			01,3532 3 3771 0	CA	PHS2CADR	SET UP EXIT IN CASE IT IS AN EVEN
0010	REF	1			01,3533 54 157 0	TS	TEMRSWCH	TABLE PHASE
0011	REF	1			01,3534 2 3566 1	CA	RTRNCADR	TO SAVE TIME ASSUME IT WILL GET NEXT
0012	REF	1			01,3535 54 767 0	TS	GCLOC +2	GROUP AFTER THIS
0013	REF	1			01,3536 3 0154 1	CA	TEMPRHS	
0014	REF	11	LAST	1276	01,3537 7 5007 1	MASK	OCT1400	
0015	REF	354	LAST	1292	01,3540 10 000 0	CCS	A	IS IT A VARIABLE OR TABLE RESTART
0016	REF	1			01,3541 1 3552 1	TCF	ITSABAR	ITS A VARIABLE RESTART
0017	REF	2	LAST	1293	01,3542 10 154 0	GETPART2	CCS TEMPRHS	IS IT AN X.1 RESTART
0018	REF	355	LAST	1293	01,3543 10 000 0	CCS	A	
0019	REF	1			01,3544 1 3652 1	TCF	ITSATPL	NO, ITS A TABLE RESTART
0020	REF	3	LAST	1290	01,3545 3 5724 1	CA	PRIO14	IT IS AN X.1 RESTART, THEREFORE START
0021	REF	42	LAST	1200	01,3546 0 5105 0	TC	FINDVAC	THE DISPLAY RESTART JOB
0022	REF	48	LAST	1289	03,1400	EBANK=	LST1	
0023	REF	1			01,3547 03040 0	2CADR	INITDSP	
0024	REF	1			01,3550 20103 1			
0024	REF	2	LAST	1293	01,3551 0 3566 1	TC	RTRNCADR	FINISHED WITH THIS GROUP, GET NEXT ONE
0025	REF	11	LAST	1293	01,3552 7 5007 1	ITSABAR	MASK OCT1400	IS IT TYPE B ?
0026	REF	356	LAST	1293	01,3553 10 300 0	CCS	A	
0027	REF	1			01,3554 1 3623 1	TCF	ITSLIKEB	YES, IT IS TYPE B
0028					01,3555 0 0006 1	EXTEND		
0029	REF	2	LAST	1293	01,3556 5 0155 0	NDX	TEMP2C	STORE THE JOB (OR TASK) 2CADR FOR EXIT
0030	REF	4	LAST	1293	01,3557 3 1437 0	CCA	PHSNAME1	
0031	REF	2	LAST	1293	01,3560 52 706 1	EXCH	GCLOC	
0032	REF	3	LAST	1293	01,3561 3 0154 1	CA	TEMPPHS	SEE IF THIS IS A JOB, TASK, OR A LONGCALL
0033	REF	3	LAST	1290	01,3562 7 4757 1	MASK	OCT7	
0034	REF	3	LAST	1147	01,3563 6 7751 0	AD	MINUS2	
0035	REF	397	LAST	1293	01,3564 10 000 0	CCS	A	
0036	REF	1			01,3565 1 3735 1	TCF	ITSLNCCCL	ITS A LONGCALL
0037	REF	6	LAST	1257	01,3566 0 4631 1	RTRNCADR	TC SWRFTURN	CANT GET HERE

L RESTARTS ROUTINE

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0038	REF	1		01,3567	1 3571 0	TCF	ITSAWAIT	
0039	REF	1		01,3570	1 3636 0	TCF	ITSAJCR	ITS A JCR
0040	REF	1		01,3571	3 3775 1	ITSAWAIT	CA	WTLTCADR
0041	REF	2	LAST 1293	01,3572	54 704 0	TS	GCLOC -1	SET UP WAITLIST CALL
0042	REF	3	LAST 1293	01,3573	50 155 0	NDX	TEMP2G	DIRECTLY STORED
0043	REF	3	LAST 1292	01,3574	3 1753 0	CA	PHSPDET1	
0044	REF	398	LAST 1293	01,3575	10 000 0	TIMEFEST	CCS	A
0045	REF	395	LAST 1294	01,3576	24 000 1	INCR	A	IS IT AN IMMEDIATE RESTART
0046	REF	1		01,3577	1 3602 1	TCF	FINDTIME	NO, FIND OUT WHEN IT SHOULD BEGIN
0047	REF	1		01,3600	1 5436 1	TCF	ITSINDIR	STORED INDIRECTLY
0048	REF	1		01,3601	1 3621 0	TCF	IMDIATE	IT WANTS AN IMMEDIATE RESTART
0049	***** THIS MUST BE IN FIXED FIXED *****							
0050				5436		PICK	02	
0051	REF	1		4000		SETLOC	FFTAG2	
0052				5436		RANK		
0053	REF	1				COUNT*	\$/RSRCL	
0054	REF	4	LAST 1294	5436	22 706 0	ITSINDIR	LXCH	GCLOC +1
0055	REF	2	LAST 1289	5437	22 006 1	LXCH	BB	GET THE CORRECT E BANK IN CASE THIS IS SWITCHED ERRASIBLE
0056	REF	400	LAST 1294	5440	50 000 1	NDX	A	GET THE TIME INDIRECTLY
0057				5441	2 000 1 0	CA	1	
0058	REF	3	LAST 1294	5442	22 006 1	LXCH	BB	RESTORE THE BB AND GCLOC
0059	REF	5	LAST 1294	5443	22 706 0	LXCH	GCLOC +1	
0060	REF	2	LAST 1294	5444	1 3602 1	TCF	FINDTIME	FIND OUT WHEN IT SHOULD BEGIN
0061	***** YOU MAY RETURN TO SWITCHED FIXED *****							
0062				01,3602		BANK	01	
0063	REF	3	LAST 1293	01,3600		SETLOC	RESTART	
0064				01,3602		RANK		
0065	REF	2	LAST 1293 TC	1294:	43 43*	COUNT*	\$/RSRCL	
0066				01,3602	4 0000 0	FINCTIME	CCM	MAKE NEGATIVE SINCE IT WILL BE SUBTRACTED AND SAVE
0067	REF	232	LAST 1283	01,3603	54 001 1	TS	L	
0068	REF	4	LAST 1294	01,3604	50 155 0	NDX	TEMP2G	
0069	REF	4	LAST 1291	01,3605	4 1052 0	CS	TRASE1	
0070				01,3606	0 0006 1	EXTEND		
0071	REF	19	LAST 1291	01,3607	60 025 1	SU	TIME1	
0072	REF	401	LAST 1294	01,3610	10 000 0	CCS	A	
0073				01,3611	4 0000 0	CCM		

L RESTARTS ROUTINE

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0074	REF	2	LAST	160	01,2612	6	7734	0	AD	00T37776	
0075	REF	128	LAST	1289	01,2613	6	4753	1	AD	ONE	
0076	REF	222	LAST	1294	01,2614	6	0011	0	AD	L	
0077	REF	402	LAST	1294	01,2615	10	0011	0	CCS	A	
0078	REF	228	LAST	1275	01,2616	3	4755	1	CA	ZFPD	
0079					01,2617	1	2621	0	TCF	+2	
0080					01,2620	1	2621	0	TCF	+1	
0081	REF	129	LAST	1295	01,2621	6	4753	1	IMMEDIATE	AD	ONE
0082	REF	6	LAST	1294	01,2622	0	0704	1	TC	GCLOC -1	
0083	REF	3	LAST	1293	01,2623	3	3566	1	ITS LIKEB	CA	RTENCADR
0084	REF	2	LAST	1293	01,2624	54	157	0	TS	TEMPSWCH	TYPE E, SC STOPP RETURN IN TEMPSWCH IN CASE OF AN EVEN PHASE
0085	REF	1			01,2625	3	3772	1	CA	PRT2CADR	SET UP EXIT TO GET TABLE PART OF THIS
0086	REF	7	LAST	1295	01,2626	54	707	0	TS	GCLOC +2	VARIABLE TYPE OF PHASE
0087	REF	4	LAST	1293	01,2627	3	0154	1	CA	TEMPPHS	MAKE THE PHASE LOCK RIGHT FOR THE TABLE
0088	REF	1			01,2630	7	6077	0	MASK	00T177	PART OF THIS VARIABLE PHASE
0089	REF	5	LAST	1295	01,2631	54	154	0	TS	TEMPPHS	
0090					01,2632	0	0006	1	EXTEND		
0091	REF	5	LAST	1294	01,2633	6	0155	0	NOX	TEMP2G	OBTAIN THE JOB'S 2CADR
0092	REF	5	LAST	1293	01,2634	3	1437	0	CCA	PHSNAME1	
0093	REF	8	LAST	1295	01,2635	52	706	1	EXCH	GCLOC	
0094	REF	6	LAST	1295	01,2636	50	155	0	ITS AJCB	NOX	NOW ADD THE PRIORITY AND LEFTS GC
0095	REF	4	LAST	1294	01,2637	3	1053	0	CA	PHSPRCT1	
0096	REF	9	LAST	1295	01,2640	54	704	0	CHKNOVAC	TS	SAVE PRIC UNTIL WE SEE IF ITS
0097					01,2641	0	0006	1	EXTEND		A FINDVAC OR A NOVAC
0098	REF	1			01,2642	6	2646	0	BZNF	ITSACVAC	
0099	REF	1			01,2643	3	3774	0	CAF	EVACCADR	POSITIVE, SET UP FINDVAC CALL.
0100	REF	10	LAST	1295	01,2644	56	704	1	XCH	GCLOC -1	PICK UP PRIC,
0101	REF	11	LAST	1295	01,2645	0	0774	1	TC	GCLOC -1	AND GC
0102	REF	1			01,2647	3	3775	1	ITSNOVAC	CAF	NEGATIVE,
0103	REF	12	LAST	1295	01,2647	56	704	1	XCH	GCLOC -1	SET UP NOVAC CALL,
0104					01,2650	4	0000	0	CCM		CORRECT PRIC,
0105	REF	13	LAST	1295	01,2651	0	0704	1	TC	GCLOC -1	AND GC
0106	REF	45	LAST	1290	01,2652	54	020	1	ITSATBL	TS	FIND OUT IF THE PHASE IS ODD OR EVEN
0107	REF	46	LAST	1295	01,2653	10	021	1	CCS	CYR	
0108					01,2654	1	3655	0	TCF	+1	IT'S EVEN
0109	REF	1			01,2655	1	3753	1	TCF	ITSEVEN	
0110	REF	4	LAST	1295	01,2656	3	3566	1	CA	RTENCADR	IN CASE THIS IS THE SECOND PART OF A
0111	REF	14	LAST	1295	01,2657	54	707	0	TS	GCLOC +2	TYPE E RESTART, WE NEED PROPER EXIT
0112	REF	6	LAST	1295	01,2660	3	0154	1	CA	TEMPPHS	SET UP POINTER FOR FINDING CUP PLACE IN
0113	REF	25	LAST	1293	01,2661	54	021	0	TS	SR	THE RESTART TABLES
0114	REF	26	LAST	1295	01,2662	6	0021	1	AD	SR	

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0115	RFF	7	LAST 1295	01,3663	50 156 0	NDX	TEMP2E	
0116	RFF	1		01,3664	6 2002 0	AD	SIZE TAB +1	
0117	RFF	1		01,3665	54 156 1	TS	POINTER	
0118				01,3666	0 0006 1	CONTPL2	EXTEND	FIND OUT WHAT'S IN THE TABLE
0119	RFF	2	LAST 1296	01,3667	5 156 0	NDX	POINTER	
0120	RFF	1		01,3670	3 2012 1	DCA	CADRTAP	GET THE 2CADR
0121	RFF	15	LAST 1295	01,3671	22 706 0	LXCH	GCLOC +1	STORE THE BP INFORMATION
0122	RFF	403	LAST 1295	01,3672	10 000 0	CCS	A	IS IT A JOB OR IS IT TIMED
0123	RFF	404	LAST 1296	01,3673	24 000 1	INCR	A	POSITIVE, MUST BE A JOB
0124	RFF	1		01,3674	1 2747 1	TCF	ITSAJOB2	
0125	RFF	405	LAST 1296	01,3675	24 000 1	INCR	A	MUST BE EITHER A WAITLIST OR LONGCALL
0126	RFF	16	LAST 1296	01,3676	54 705 1	TS	GCLOC	LET'S STORE THE CORRECT CADR
0127	RFF	2	LAST 1294	01,3677	3 3775 1	CA	WTLTCADR	SET UP CLR EXIT TO WAITLIST
0128	RFF	17	LAST 1296	01,3700	54 704 0	TS	GCLOC -1	
0129	RFF	18	LAST 1296	01,3701	3 0706 0	CA	GCLOC +1	NOW FIND OUT IF IT IS A WAITLIST CALL
0130	RFF	38	LAST 1295	01,3702	7 4742 0	MASK	BIT10	THIS SHOULD BE ONE IF WE HAVE -88
0131	RFF	406	LAST 1296	01,3703	10 000 0	CCS	A	FOR THAT MATTER SO SHOULD BE BITS 5,6,7,
0132								6,5, AND LAST BUT NOT LEAST (PERHAPS NOT
0133								IN IMPORTANCE ANYWAY. BIT 4
0134	RFF	1		01,3704	1 2742 1	TCF	ITSWTLST	IT IS A WAITLIST CALL
0135	RFF	3	LAST 1296	01,3705	50 156 0	NDX	POINTER	OBTAIN THE ORIGINAL DELTA T
0136	RFF	1		01,3706	3 2 00 0	CA	FRFTAP	ADDRESS FOR THIS LONGCALL
0137	RFF	1		01,3707	1 5445 0	TCF	ITSLGCL1	NOW GO GET THE DELTA TIME
0138	*****		THIS MUST BE IN FIXED FIXED *****					
0139				5445		BLOCK	02	
0140	RFF	2	LAST 1294	5446		SETLOC	FFTAG2	
0141				5445		PANK		
0142	RFF	2	LAST 1294 TO 1294:	7	7*	COUNT*	\$4/RSPCL	
0143	RFF	19	LAST 1296	5445	22 706 0	ITSLGCL1	LXCH GCLOC +1	OBTAIN THE CORRECT F PANK
0144	RFF	4	LAST 1294	5446	22 006 1		LXCH BP	
0145	RFF	2	LAST 1296	5447	22 7 6 0		LXCH GCLOC +1	AND PRESERVE CUR E AND F BANKS
0146				5450	0 0006 1	EXTEND		GET THE DELTA TIME
0147	RFF	407	LAST 1296	5451	5 0000 1	NDX	A	
0148				5452	3 0001 0	DCA	C	
0149	RFF	21	LAST 1296	5453	22 706 0	LXCH	GCLOC +1	RESTORE CUR E AND F BANK
0150	RFF	5	LAST 1296	5454	22 006 1	LXCH	BP	RESTORE THE TASKS E AND F BANKS
0151	RFF	22	LAST 1296	5455	22 706 0	LXCH	GCLOC +1	AND PRESERVE CUR L

L RESTARTS ROUTINE

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0152 RFF 1 5456 1 3711 TCF ITSLGCL2 NOW LET'S PROCESS THIS LONGCALL

R0153 ***** YCU MAY RETURN TO SWITCHED FIXED *****

0154 01,2710 BANK 01
 0155 RFF 4 LAST 1294 1,2710 SFTLCC RESTART
 0156 01,3710 BANK

0157 RFF 3 LAST 1294 TO 1296: 70 112* COLN1* \$1/RSROL
 0158 RFF 0 LAST 1124 01,3710 53*153 0 ITSLCCL2 EXCH LONGTIME

0159 01,3711 0 0006 1 EXTEND CALCULATE TIME LEFT
 0160 RFF 32 LAST 1291 01,3712 4 0 25 1 DCS TIME2
 0161 RFF 9 LAST 1297 01,3713 21*153 0 CAS LONGTIME
 0162 01,3714 0 0006 1 EXTEND
 0163 RFF 2 LAST 1291 01,3715 3 1151 0 DCA LONGBASE
 0164 RFF 10 LAST 1297 01,3716 21*153 0 CAS LONGTIME

0165 RFF 11 LAST 1297 01,3717 11*152 1 CCS LONGTIME FIND OUT HOW THIS SHOULD BE RESTARTED
 0166 RFF 1 01,3720 1 3730 1 TCF LONGCLCL
 0167 01,3721 1 3723 0 TCF +2
 0168 RFF 2 LAST 1294 01,3722 1 3616 1 TCF IMMEDIATE -3
 0169 RFF 12 LAST 1297 01,3723 11*153 0 CCS LONGTIME +1
 0170 RFF 2 LAST 1297 01,3724 1 3730 1 TCF LONGCLCL
 0171 01,3725 13 726 0 NOOP
 0172 RFF 3 LAST 1297 01,3726 1 3616 1 TCF IMMEDIATE -3
 0173 RFF 4 LAST 1297 01,3727 1 2621 0 TCF IMMEDIATE

CAN'T GET HERE *****

0174 RFF 1 01,3730 3 3773 1 LONGCLCL CA LGCLCADR
 0175 RFF 23 LAST 1296 01,3731 54 704 0 TS GCLOC -1

WE WILL GO TO LONGCALL

0176 01,3732 0 0006 1 EXTEND
 0177 RFF 13 LAST 1297 01,3733 3 1153 1 DCA LONGTIME
 0178 RFF 24 LAST 1297 01,3734 0 3734 1 TC GCLOC -1

PREPARE OUR ENTRY TO LONGCALL

0179 RFF 3 LAST 1296 01,3735 3 3775 1 ITSLNGCL CA WAITCADR
 0180 RFF 25 LAST 1297 01,3736 54 704 0 TS GCLOC -1

ASSUME IT WILL GO TO WAITLIST

0181 RFF 8 LAST 1296 01,3737 50 155 0 NDX TEMP2C
 0182 RFF 5 LAST 1295 01,3740 4 1053 1 CS PHSPROT1

GET THE DELTA 1 ADDRESS

0183 RFF 2 LAST 1296 1,2741 1 5445 0 TCF ITSLGCL1

NOW GET THE DELTA TIME

0184 RFF 26 LAST 1297 01,3742 4 0706 1 ITSWILST CS GCLOC +1
 0155 RFF 27 LAST 1297 01,3743 54 706 1 TS GCLOC +1

CORRECT THE BECCA INFORMATION

0186 RFF 4 LAST 1296 01,3744 50 156 0 NDX PCINTER
 0187 RFF 2 LAST 1296 01,3745 3 2000 0 CA PRODTAB

GET THE CT AND FIND OUT IF IT WAS STORED DIRECTLY OR INDIRECTLY

0188 RFF 1 1,3746 1 3575 1 TCF TIMTEST

FIND OUT HOW THE TIME IS STORED

L RESTARTS ROUTINE

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0189	REF	28	LAST 1297	01,3747	56 775 0	ITSACE2	XCF	GCLOC	STORE THE CADR
0190	REF	5	LAST 1297	01,3750	50 156 0		NDX	PCINTER	ADD THE PRIORITY AND LET'S GO
0191	REF	3	LAST 1297	01,3751	3 200 0		CA	PRDTTAB	
0192	REF	1		01,3752	1 3640 1		TCF	CFKNCVAC	
0193	REF	3	LAST 1295	01,3753	3 157 1	ITSEVEN	CA	TEMPSWCH	SET UP FOR EITHER THE SECOND PART OF THE
0194	REF	29	LAST 1298	01,3754	54 717 0		TS	GCLOC +2	TABLE, OR A RETURN FOR THE NEXT GCLOC
0195	REF	9	LAST 1297	01,3755	50 155 0		NDX	TEMP2C	SET UP PCINTER FOR OUR LOCATION WITHIN
0196	REF	2	LAST 1296	01,3756	2 202 1		CA	SIZETAB	THE TABLE
0197	REF	7	LAST 1295	01,3757	6 0154 1		AC	TEMPPHS	THIS MAY LOCK BAD BUT LET'S SPE YCL CC
0198	REF	8	LAST 1298	01,3760	6 0154 1		AD	TEMPPHS	BETTER IN TIME OF NUMBERR OF LOCATIONS
0199	REF	9	LAST 1298	01,3761	6 0154 1		AD	TEMPPHS	
0200	REF	6	LAST 1298	01,3762	54 155 1		TS	PCINTER	
0201	REF	1		01,3763	1 3666 0		TCF	CONTBL2	NEW PROCESS WHAT IS IN THE TABLE
0202	REF	36	LAST 1275	01,3764	3 6250 1	PHSPART2	CA	THREE	SET THE POINTER FOR THE SECOND HALF OF
0203	REF	7	LAST 1298	01,3765	26 156 1		ADS	PCINTER	THE TABLE
0204	REF	5	LAST 1295	01,3766	3 3566 1		CA	RTPNCADR	THIS WILL BE OUR LAST TIME THROUGH THE
0205	REF	30	LAST 1298	01,3767	54 717 0		TS	GCLOC +2	EVEN TABLE, SO AFTER IT GET THE NEXT
0206	REF	2	LAST 1298	01,3770	1 3666 0		TCF	CONTBL2	GROUP
0207	REF	2	LAST 1298	01,3770	1 3666 0		TCF	CONTBL2	SO LET'S GET THE SECOND ENTRY IN THE TEL
0208	REF	779	LAST 1293	0154		TEMPPHS	EQUALS	MPAC	
0209	REF	780	LAST 1298	0155		TEMP2C	EQUALS	MPAC +1	
0210	REF	781	LAST 1298	0156		PCINTER	EQUALS	MPAC +2	
0211	REF	782	LAST 1298	0157		TEMPSWCH	EQUALS	MPAC +3	
0212	REF	1		0715		GCLOC	EQUALS	VAC5 +2CD	
0213	REF	8	LAST 1276	7751		MINUS2	EQUALS	NFC2	
0214	REF	9	LAST 1172	6077		CT177	EQUALS	LEN7	
0215	REF	1		01,3771	03764 1	PHS2CAGR	GENADR	PHSPART2	
0216	REF	1		01,3772	03542 1	PRT2CAGR	GENADR	GFTPART2	
0217	REF	5	LAST 1201	01,3773	05277 0	LGCLCADR	GENADR	LGNGCALL	
0218	REF	42	LAST 1293	01,3774	05105 0	EVACCAAGR	GENADR	FINDVAC	
0219	REF	25	LAST 1124	01,3775	05203 0	WILTCADR	GENADR	WAITLIST	
0220	REF	27	LAST 1284	01,3776	05072 1	NCVACADR	GENADR	NCVAC	

L IML MODE SWITCHING ROUTINES

USFR'S PAGE NO. 1 FC 54

0001			5457	BLOCK 02
0002	REF 1		4110	SETLOC FFTAG2
0003			5457	BANK
0004	REF 1		53,1471	EBANK= COMMAND

R0005 FIXED-FIXED ROUTINES.

0006	REF 1				COUNT# \$\$/INCR	
0007	REF 229	LAST 1295	5457	3 4755 1	ZEROICDU CAF	ZFRD
0008	REF 18	LAST 1246	5460	54 032 1	TS	CDUX
0009	REF 9	LAST 1246	5461	54 032 0	TS	CDLY
0010	REF 12	LAST 1250	5462	54 034 1	TS	CDUZ
0011	REF 346	LAST 1291	5463	0 0002 0	TC	G
0012	REF 26	LAST 1275	4743		SPSCODE =	BIT9

ZFRD ICUL COUNTERS.

L IMU MODE SWITCHING ROUTINES

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P0013 IMU ZEROING ROUTINE.

0014				11,2774		BANK	11	
0015	REF	1		07,2777		SETLCC	MODESW	
0016				07,2776		BANK		
0017	REF	1				COUNT*	\$\$/IMODE	
0018				07,2776	0 0014 0	IMUZERO	INHINT	ROUTINE TO ZERO ICDS.
0019	REF	42	LAST	527	07,2797	4 1935 1	CS	DSPTAB +110
0020	REF	4	LAST	213	07,2710	7 4771 0	MASK	BITS486
0021	REF	408	LAST	1296	07,2711	10 000 0	CCS	A
0022	REF	1			07,2712	1 2716 1	TCF	IMUZFRDA
0023	REF	44	LAST	1244	07,2713	0 5567 0	TC	ALARM
0024					07,2714	0 0206 0	OCT	00206
0025	REF	1			07,2715	1 3651 1	TCF	CACETSTJ +4
								IMMEDIATE FAILURE.
0032	REF	2	LAST	1300	07,2716	1 3645 0	IMUZFRDA TC	CACETSTJ
0033								
0034	REF	38	LAST	900	07,2717	4 1300 1	CS	IMODES33
0035	REF	2	LAST	852	07,2720	7 4773 1	MASK	SUPFR011
0036	REF	30	LAST	1300	07,2721	27 1300 1	ALS	IMODES33
0037	REF	47	LAST	975	07,2722	4 1277 0	CS	IMODES30
0038	REF	1			07,2723	7 5741 1	MASK	BITS364
0039	REF	48	LAST	1300	07,2724	27 1277 0	ADS	IMODES30
0040	REF	5	LAST	1300	07,2725	4 4771 0	CS	BITS486
0041					07,2726	0 0016 1	EXTEND	
0042	REF	54	LAST	900	07,2727	03 012 1	WAND	CHAN12
0043	REF	3	LAST	167	07,2730	0 3260 0	TC	NOATTTCF
								TURN OFF NO ATT LAMP.
0044	REF	41	LAST	1275	07,2731	3 4747 1	CAF	BIT5
0045					07,2732	1 0016 1	EXTEND	
0046	REF	55	LAST	1300	07,2733	05 012 1	WCF	CHAN12
00461	REF	3	LAST	167	07,2734	0 5457 1	TC	ZEROICDL
0047	REF	49	LAST	1275	07,2735	3 4746 0	CAF	BIT6
0048	REF	40	LAST	1296	07,2736	0 5213 0	TC	WAITLIST
0049	REF	3	LAST	171	03,1474		EBANK=	COLIND
0050	REF	1			07,2737	1 2751 0	2CACR	IMUZERC2
0050	REF	1			07,2740	16103 1		
0051	REF	49	LAST	1300	07,2741	4 1277 0	CS	IMODES30
0052	REF	27	LAST	1296	07,2742	7 4743 1	MASK	BIT9
0053	REF	408	LAST	1300	07,2743	10 000 0	CCS	A
0054	REF	1			07,2744	1 2747 0	TCF	MODEEXIT
								SEE IF IMU OPERATING AND ALARM IF NOT.

L IML MODE SWITCHING POINTS

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0055	REF	45	LAST 1311	07,2745	5567 0	TC	ALARM	
0056				07,2746	00210 1	CCT	210	
0057				07,2747	0 0003 1	MODEEXIT	RELINT	GENERAL MODE-SWITCHING EXIT.
0058	REF	7	LAST 1293	07,2750	1 4631 0	TCF	SWRETURN	
0059	REF	1		07,2751	3 3633 1	IMUZERC2	TC	CACETEST
0061	REF	4	LAST 1300	07,2752	5457 1	TC	ZEROICCU	ZERC CDUX, CDUY, CDUZ
0062	REF	41	LAST 1300	07,2753	4 4747 0	CS	BIT5	REMOVE ZERC DISCRETE.
0063				07,2754	0 0006 1	EXTEND		
0064	REF	56	LAST 1300	07,2755	03 012 1	WAND	CHAN12	
0065	REF	28	LAST 1275	07,2756	3 4741 1	CAF	BIT11	WAIT 10 SECS FOR CTRS TO FIND GIMBALS
0066	REF	10	LAST 895	07,2757	0 5224 0	TC	VAROFLAY	
0067	REF	2	LAST 1301	07,2760	0 3633 1	IMUZERC3	TC	CACETEST
0069	REF	2	LAST 1300	07,2761	4 5741 1	CS	BITS364	REMOVE IMUFAIL AND ICCDFAIL INHIBIT.
0070	REF	50	LAST 1300	07,2762	7 1277 0	MASK	IMODES30	
0071	REF	51	LAST 1301	07,2763	55 0277 0	TS	IMODES30	
0072	REF	3	LAST 1300	07,2764	4 4773 1	CS	SUPER011	ENABLE CAP AUTO AND HOLD MODES
0073	REF	40	LAST 1300	07,2765	7 1300 1	MASK	IMODES33	BIT5 FOR GROUND
0074	REF	41	LAST 1301	07,2766	55 0300 1	TS	IMODES33	
0075	REF	48	LAST 959	07,2767	0 4674 0	TC	IEKNCALL	SET ISS WARNING IF EITHER OF ABOVE ARE
0076	REF	5	LAST 181	07,2770	14703 0	CADR	SETISSW	PRESENT.
0077	REF	1		07,2771	1 3623 1	TCF	ENDIMU	

L TWO MODE SWITCHING ROUTINES

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P0078 TML COARSE ALIGN MODE.

0079				07,2772	0 0004 0	IMLCARS	INHINT	
0080	REF	3	LAST 1300	07,2773	0 3645 0	TC	CAGETSTJ	
0081	REF	2	LAST 1700	07,2774	0 3136 0	TC	SFTCCARS	
0082	REF	23	LAST 1275	07,2775	3 6245 1	CAF	SIX	
0083	REF	41	LAST 1300	07,2776	0 5203 0	TC	WAITLIST	
0084	REF	4	LAST 1300	07,2777	0 3147 4	FRANK=	CELINE	
0085	REF	1		07,2777	13102 0	2CADR	CCARS	
0086	REF	1		07,3000	16103 1			
0086	REF	2	LAST 1300	07,3001	1 2747 0	TCF	MODEEXIT	
0087	REF	3	LAST 1301	07,3002	0 3633 1	CCARS	TC	CAGETSTJ
0088	REF	50	LAST 1300	07,3003	3 4746 0	CAF	PIT6	
0089				07,3004	0 0006 1	EXTEND		
0090	REF	57	LAST 1301	07,3005	05 012 1	WCR	CFAN12	
0091	REF	80	LAST 1290	07,3006	3 4752 0	CAF	TWO	
0092	REF	5	LAST 1302	07,3007	55 1474 0	CCARS1	TS	CDUIND
0093	REF	6	LAST 1302	07,3008	51 1474 1	INDEX	CDUIND	
0094	REF	21	LAST 1244	07,3011	3 1321 1	CA	THETAD	
0095				07,3012	0 0006 1	EXTEND		
0096	REF	7	LAST 1302	07,3013	5 1474 1	INDEX	CDUIND	
0097	REF	19	LAST 1295	07,3014	23 032 1	MSU	CDUX	
0098				07,3015	0 0005 1	EXTEND		
0099	REF	42	LAST 1275	07,3016	7 4737 1	MF	BIT13	
0100	REF	234	LAST 1295	07,3017	56 001 0	XCH	L	
0101				07,3020	60 000 1	CCUPLE		
0102	REF	41	LAST 1290	07,3021	54 001 1	TS	ITLMP1	
0103				07,3022	1 3024 0	TCF	+2	
0104	REF	235	LAST 1302	07,3023	26 001 1	ADS	L	
0105	REF	8	LAST 1302	07,3024	51 1474 1	INDEX	CDUIND	
0106	REF	2	LAST 1295	07,3025	23 1471 1	LXCH	COMMAND	
0107	REF	9	LAST 1302	07,3026	11 1474 0	CCS	CELINE	
0108	REF	1		07,3027	0 3007 0	TC	CCARS1	
0109	REF	81	LAST 1302	07,3030	3 4752 0	CAF	TWO	
0110	REF	11	LAST 1301	07,3031	0 5224 0	TC	VARDELAY	

ENABLE ALL THREE ISS CCU ERROR COUNTERS

SET CCU INDICATOR

COMPUTE THETAD - THETAA IN 1:5
COMPLEMENT FORMSHIFT RIGHT 2
ROUND

DIFFERENCE TO BE COMPUTED

MINIMUM OF 4 MS WAIT

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0111	REF	4	LAST 1302	07,3032	0 3623 1	CCARS2	TC	CAGETEST	DO NOT CONTINUE IF CAGED.
0112	REF	42	LAST 1302	07,3033	54 061 1		TS	ITEMP1	SETS TC +0.
0113	REF	82	LAST 1302	07,3034	3 4752 0		CAF	TWO	SET CEL INDICATOR
0114	REF	17	LAST 1302	07,3035	55 474 0	+3	TS	CCLINE	
0115	REF	11	LAST 1303	07,3036	51 474 1		INDEX	CCUIND	
0116	REF	3	LAST 1302	07,3037	11 471 0		CCS	COMMAND	NUMBER OF PULSES REQUIRED
0117	REF	1		07,3040	3044 1		TC	CMPOS	GREATER THAN MAX ALLOWED
0118	REF	1		07,3041	0 3053 1		TC	NEXTCDL +1	
0119	REF	1		07,3042	0 3111 0		TC	CMNEG	
0120	REF	2	LAST 1303	07,3043	0 3052 1		TC	NEXTCDL +1	
0121	REF	1		07,3044	6 3737 1	CMPOS	AD	-COMMAX	COMMAX = MAX NUMBER OF PULSES ALLOWED
0122				07,3045	0 0006 1		EXTEND		MINUS ONE
0123	REF	1		07,3046	6 3121 0		BZMF	COMZERO	
0124	REF	12	LAST 1303	07,3047	51 474 1		INDEX	CCUIND	
0125	REF	4	LAST 1303	07,3050	55 471 0		TS	COMMAND	REDUCE COMMAND BY MAX NUMBER OF PULSES
0126	REF	1		07,3051	4 3740 0		CS	-COMMAX-	ALLOWED
0127	REF	42	LAST 1303	07,3052	24 061 0	NEXTCDL	INCR	ITEMP1	
0128	REF	25	LAST 1276	07,3053	6 4754 0		AD	NEGO	
0129	REF	13	LAST 1303	07,3054	51 474 1		INDEX	CCUIND	
0130	REF	3	LAST 283	07,3055	54 050 0		TS	CCUXCMD	SET UP COMMAND REGISTER.
0131	REF	14	LAST 1303	07,3056	11 474 0		CCS	CCUIND	
0132	REF	1		07,3057	0 3035 1		TC	CCARS2 +3	
0133	REF	44	LAST 1303	07,3060	10 061 1		CCS	ITEMP1	SEE IF ANY PULSES TO CC OUT.
0134	REF	1		07,3061	1 3125 0		TCF	SENOPLS	
0135	REF	16	LAST 1112	07,3062	0 5221 0		TC	FIXCDLAY	WAIT FOR GIMBALS TO SETTLE.
0136				07,3063	0 0226 1		DEC	150	
0137	REF	83	LAST 1303	07,3064	3 4752 0		CAF	TWO	AT END OF COMMAND, CHECK TC SEE THAT
0138	REF	45	LAST 1303	07,3065	54 061 1	CHKCCRS	TS	ITEMP1	GIMBALS ARE WITHIN 2 DEGREES OF THETA.
0139	REF	410	LAST 1300	07,3066	50 000 1		INDEX	A	
0140	REF	20	LAST 1302	07,3067	3 0032 0		CA	CCLX	
0141				07,3070	0 0006 1		EXTEND		
0142	REF	46	LAST 1303	07,3071	5 0061 0		INDEX	ITEMP1	
0143	REF	22	LAST 1302	07,3072	20 321 0		MSL	THETA	
0144	REF	411	LAST 1302	07,3073	10 000 0		CCS	A	
0145	REF	1		07,3074	1 3102 0		TCF	CCARSERR	
0146	REF	1		07,3075	1 3077 0		TCF	CCFSCHK2	
0147	REF	2	LAST 1303	07,3076	1 3102 0		TCF	CCARSERR	

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0148	REF	47	LAST 1302	07,3177	10 061 1	CCRSCHK2	CCS	11FMF1	
0149	REF	1		07,3100	1 3765 0		TCF	CHKCCRS	
0150	REF	2	LAST 1301	07,3101	1 3673 1		TCF	ENDIMU	END OF COARSE ALIGNMENT.
0151	REF	1		07,3102	6 311 1	COARSEERR	AD	COARSTOL	2 DEGREES.
0152				07,3103	0 0006 1		EXTEND		
0153	REF	2	LAST 1303	07,3104	6 3077 1		BZMF	CCRSCHK2	
0154	REF	46	LAST 1301	07,3105	0 5567 0		TC	ALARM	COARSE ALIGN ERROR.
0155				07,3106	0 0211 0		CCT	211	
0156	REF	2	LAST 166	07,3107	1 2621 1		TCF	IMLBAD	
0157				07,3110	77511 1	COARSTOL	DEC	-0.01111	2 DEGREES SCALED AT HALF-REVOLUTIONS
0158	REF	2	LAST 1303	07,3111	6 2737 1	CCMNEG	AD	-CCMNX	
0159				07,3112	0 0006 1		EXTEND		
0160	REF	2	LAST 1303	07,3113	6 3121 0		BZMF	CCMZERR	
0161				07,3114	4 0000 0		CCM		
0162	REF	15	LAST 1303	07,3115	51'474 1		INDEX	COLIND	
0163	REF	5	LAST 1303	07,3116	55'471 0		TS	COMMAND	
0164	REF	2	LAST 1303	07,3117	3 2740 1		CA	-CCMNX-	
0165	REF	3	LAST 1303	07,3120	0 3052 0		TC	NEXTCOL	
0166	REF	230	LAST 1299	07,3121	3 4755 1	CCMZERR	CAF	ZERO	
0167	REF	16	LAST 1304	07,3122	51'474 1		INDEX	COLIND	
0168	REF	6	LAST 1304	07,3123	57'471 1		XCF	COMMAND	
0169	REF	4	LAST 1304	07,3124	0 2052 0		TC	NEXTCOL	
0170	REF	3	LAST 534	07,3125	3 7743 0	SENDPLLS	CAF	13,14,15	
0171				07,3126	0 0006 1		EXTEND		
0172	REF	16	LAST 900	07,3127	05 014 1		WOR	CHAN14	
0173	REF	1		07,3130	3 3741 0		CAF	60 HRS	
0174	REF	2	LAST 1303	07,3131	1 3031 1		TCF	CCARS2 -1	THEN TC VARDLBY
0175	REF	51	LAST 1302	07,3132	3 4746 0	CA+ECF	CAF	BIT6	ENABLE ALL THREE ISS COL ERROR COUNTERS
0176				07,3133	0 0006 1		EXTEND		
0177	REF	58	LAST 1302	07,3134	05 012 1		WOR	CHAN12	
0178	REF	73	LAST 1200	07,3135	0 5261 1		TC	TASKOVER	

1 IMU MODE SWITCHING ROUTINES

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0179	REF	43	LAST	1275	07,3136	3	4757	1	SFTCOARS	CAF	BIT4	BYPASS IF ALREADY IN COARSE ALIGN
0180					07,3137	0	0006	1		EXTEND		
0181	REF	59	LAST	1304	07,3140	02	012	0		RAND	CHAN12	
0182	REF	412	LAST	1303	07,3141	10	000	0		CCS	A	
0183	REF	247	LAST	1295	07,3142	0	0002	0		TC	G	
0184	REF	52	LAST	1304	07,3143	4	4746	1		CS	BIT6	CLEAR ISS ERROR COUNTERS
0185					07,3144	0	0006	1		EXTEND		
0186	REF	60	LAST	1305	07,3145	02	012	1		RAND	CHAN12	
0187	REF	39	LAST	1296	07,3146	4	4742	0		CS	BIT10	KNOCK DOWN GYRO ACTIVITY
0188					07,3147	0	0006	1		EXTEND		
0189	REF	17	LAST	1304	07,3150	02	014	1		RAND	CHAN14	
0190	REF	231	LAST	1304	07,3151	4	4755	0		CS	ZERO	
0191	REF	2	LAST	176	07,3152	54	047	0		TS	GYROCMD	
0192	REF	44	LAST	1305	07,3153	3	4750	1		CAF	BIT4	PUT ISS IN COARSE ALIGN
0193					07,3154	0	0006	1		EXTEND		
0194	REF	61	LAST	1305	07,3155	05	012	1		RAND	CHAN12	
0195	REF	43	LAST	1300	07,3156	4	1035	1		CS	DSPTAR +110	TURN ON AD ATT LAMP
0196	REF	1			07,3157	7	3201	0		MASK	OCT40010	
0197	REF	44	LAST	1305	07,3160	27	035	1		ADS	DSPTAR +110	
0198	REF	42	LAST	1301	07,3161	4	1300	1		CS	IMODES33	DISABLE CAP ALTC AND HOLD MODES
0199	REF	52	LAST	1305	07,3162	7	4746	1		MASK	BIT6	
0200	REF	43	LAST	1305	07,3163	27	030	1		ADS	IMODES33	
0201	REF	52	LAST	1301	07,3164	4	1277	0		CS	IMODES30	DISABLE IMCFAIL
0202	REF	45	LAST	1205	07,3165	7	4750	0		MASK	BIT4	
0203	REF	53	LAST	1305	07,3166	27	0277	0		ADS	IMODES30	
0204	REF	14	LAST	520	07,3167	4	4747	0	RNDPREF	CS	TRACKBIT	CLEAR TRACK FLAG
0205	REF	32	LAST	960	07,3170	7	0075	1		MASK	FLAGWRD1	
0206	REF	33	LAST	1305	07,3171	54	075	1		TS	FLAGWRD1	
0207	REF	3	LAST	852	07,3172	4	4735	0		CS	DRFTBIT	CLEAR DRIFT FLAG
0208	REF	29	LAST	1113	07,3173	7	0076	1		MASK	FLAGWRD2	
0209	REF	30	LAST	1305	07,3174	54	076	1		TS	FLAGWRD2	
0210	REF	6	LAST	968	07,3175	4	4737	1		CS	REFSMBIT	CLEAR PFSMMAT FLAG
0211	REF	18	LAST	968	07,3176	7	0077	0		MASK	FLAGWRD3	
0212	REF	15	LAST	1305	07,3177	54	077	0		TS	FLAGWRD3	
0213	REF	348	LAST	1305	07,3200	0	0002	0		TC	Q	
0214					07,3201	4	0010	1	OCT40010	OCT	40010	

L IMU MODE SWITCHING ROUTINES

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P0215 IMU FINE ALIGN MODE SWITCH.

0216				07,3202	0 0004 0	IMUFINE	INHINT		
0217	REF	4	LAST 1302	07,3203	0 3645 0	TC	CAGETSTJ	SEE IF IMU BEING CAGED.	
0218	REF	1		07,3204	4 3736 1	CS	BITS4-5	RESET ZERO AND CCARSE	
0219				07,3205	0 0006 1	EXTEND			
0220	REF	62	LAST 1305	07,3206	03 012 1	WAND	CHAN12		
0221	REF	54	LAST 1305	07,3217	4 4746 1	CS	BIT6	INSURE DAP AUTO AND HOLD MODES ENABLED	
0222	REF	44	LAST 1305	07,3210	7 1300 1	MASK	IMODES33		
0223	REF	45	LAST 1306	07,3211	55 300 1	TS	IMODES23		
0224	REF	4	LAST 1300	07,3212	0 3260 0	TC	NCATTCEP		
0225	REF	40	LAST 1305	07,3213	2 4742 1	CAF	BIT10	IMU FAIL WAS INHIBITED DURING THE	
0226	REF	42	LAST 1302	07,3214	1 5203 0	TC	WAITLIST	PRESUMABLY PRECEDING COARSE ALIGN. LEAVE	
0227	REF	17	LAST 1304	03,1474		EBANK=	CCUINC		
0228	REF	1		07,3215	02226 1	2CADR	1FAILCK	IT ON FOR THE FIRST 5 SECS OF FINE ALIGN	
0228	REF	1		07,3216	16103 1				
0229	REF	6	LAST 955	07,3217	2 5000 1	CAF	2SECS		
0230	REF	43	LAST 1306	07,3220	1 5203 0	TC	WAITLIST		
0231	REF	18	LAST 1306	03,1474		EBANK=	CCUINC		
0232	REF	1		07,3221	02224 0	2CADR	1MCFINED		
0232	REF	1		07,3222	16103 1				
0233	REF	2	LAST 1302	07,3223	1 2747 0	TCF	MCLFEXIT		
0234	REF	5	LAST 1303	07,3224	0 2633 1	IMLFINEP	TC	CAGETEST	SEE THAT NO ONE HAS CAGED THE IMU.
0235	REF	2	LAST 1304	07,3225	1 3623 1	TCF	ENDIMU		

L 1ML MODE SWITCHING ROUTINES

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0236	REF	1		07,3226	0 3640 0	1FAIL0K	TC	GAGETSTQ	ENABLE 1ML FIAL UNLESS 1ML BEING CAGED.
0237	REF	74	LAST 1304	07,3227	1 5261 0		TCF	TASKOVER	IT IS.
0239	REF	46	LAST 1315	07,3230	3 4750 1		CAF	BIT4	DO NOT RESET 1ML FAIL INHIBIT IF SOMEONE
0239				07,3231	1 0016 1		EXTEND		HAS GONE INTO COARSE ALIGN.
0240	REF	63	LAST 1316	07,3232	02 012 0		RAND	CHAN12	
0241	REF	413	LAST 1315	07,3233	10 000 0		FCS	A	
0242	REF	75	LAST 1307	07,3234	1 5261 0		TCF	TASKOVER	
0243	REF	54	LAST 1305	07,3235	4 1277 0		CS	IMODES30	RESET 1MUFAIL.
0244	REF	44	LAST 1302	07,3236	7 4737 1		MASK	BIT13	
0245	REF	55	LAST 1307	07,3237	27 277 0		ADS	IMODES30	
0246	REF	47	LAST 1317	07,3240	4 4750 0		CS	BIT4	
0247	REF	56	LAST 1307	07,3241	7 1277 0	PFAIL0K2	MASK	IMODES30	
0248	REF	57	LAST 1317	07,3242	55 277 0		TS	IMODES30	
0249	REF	49	LAST 1301	07,3243	1 4674 0		TC	IRKCALL	THE ISS WARNING LIGHT MAY COME ON NOW
0250	REF	6	LAST 1301	07,3244	14713 0		CAEP	SETISSW	THAT THE INHIBIT HAS BEEN REMOVED.
0251	REF	76	LAST 1307	07,3245	1 5261 0		TCF	TASKOVER	
0252	REF	2	LAST 1307	07,3246	0 3640 0	PFAIL0K	TC	GAGETSTQ	ENABLE PIP FAIL PROG ALARM.
0253	REF	77	LAST 1307	07,3247	1 5261 0		TCF	TASKOVER	
0254	REF	58	LAST 1307	07,3251	4 1277 0		CS	IMODES30	RESET 1ML AND PIPA FAIL BITS.
0255	REF	41	LAST 1306	07,3251	7 4742 0		MASK	BIT10	
0256	REF	59	LAST 1307	07,3252	27 277 0		ADS	IMODES30	
0257	REF	46	LAST 1306	07,3253	4 1277 1		CS	IMODES33	
0258	REF	45	LAST 1307	07,3254	7 4737 1		MASK	BIT13	
0259	REF	47	LAST 1307	07,3255	27 277 1		ADS	IMODES33	
0260	REF	42	LAST 1301	07,3256	4 4747 0		CS	BIT5	
0261	REF	1		07,3257	1 2241 1		TCF	PFAIL0K2	
0262	REF	2	LAST 1305	07,3261	4 3231 0	NOATT0FF	CS	OCT40010	SUBROUTINE TO TURN OFF NO ATT LAMP.
0263	REF	45	LAST 1305	07,3261	7 1135 1		MASK	DSPTAB +110	
0264	REF	44	LAST 1288	07,3262	6 4735 1		AD	BIT15	
0265	REF	46	LAST 1307	07,3263	55 1135 1		TS	DSPTAB +110	
0266	REF	345	LAST 1305	07,3264	0 0002 0		TC	G	

L IML MODE SWITCHING ROUTINES

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P0267 POLITAES TO INITIATE AND TERMINATE PROGRAM USE OF THE PIPAS. NO IMUSTALL REQUIRED IN EITHER CASE.

0272	REF	232	LAST	1305	07,3265	4 4755 0	PIPUSE	CS	ZERO	
0273	REF	15	LAST	945	07,3266	54 037 1		TS	PIPAX	
0274	REF	6	LAST	945	07,3267	54 041 1		TS	PIPAY	
0275	REF	9	LAST	945	07,3270	54 041 0		TS	PIPAZ	
02752	REF	3	LAST	1307	07,3271	0 3640 0	PIPUSE1	TC	CAGETSTG	DO NOT ENABLE PIPA FAIL IF IML IS CAGED
02754	REF	8	LAST	1301	07,3272	1 4631 0		TCF	SWRETURN	
02756					07,3273	0 0014 0		INHINT		
0276	REF	52	LAST	1275	07,3274	4 4753 0		CS	BIT1	IF PIPA FAILS FROM NOW ON (UNTIL
0277	REF	60	LAST	1307	07,3275	7 1277 0		MASK	IMODES30	PIPFREE), LIGHT ISS WARNING.
0278	REF	61	LAST	1308	07,3276	55 1277 0		TS	IMODES32	
0279	REF	51	LAST	1307	07,3277	0 4674 0	PIPFREE2	TC	IENKCALL	ISS WARNING MIGHT COME ON NOW.
0280	REF	7	LAST	1307	07,3300	14712 0		CADR	SETISSW	(CR GC OFF ON PIPFREE).
0281	REF	4	LAST	1306	07,3301	1 2747 0		TCF	MODEEXIT	
0282					07,3302	0 0014 0	PIPFREE	INHINT		PROGRAM COME WITH PIPAS. CONT LIGHT
0283	REF	62	LAST	1308	07,3303	4 1277 0		CS	IMODES30	ISS WARNING.
0284	REF	53	LAST	1308	07,3304	7 4753 0		MASK	BIT1	
0285	REF	63	LAST	1308	07,3305	27 1277 0		ADS	IMODES30	
0286	REF	42	LAST	1307	07,3306	7 4742 0		MASK	BIT10	IF PIP FAIL ON, DC PREC ALARM AND RESET
0287	REF	414	LAST	1307	07,3307	10 010 0		CCS	A	ISS WARNING.
0288	REF	5	LAST	1308	07,3310	1 2747 0		TCF	MODEEXIT	
0289	REF	47	LAST	1304	07,3311	0 5567 0		TC	ALARM	
0290					07,3312	00212 0		CCT	212	
0291					07,3313	0 0004 0		INHINT		
0292	REF	1			07,3314	1 3277 1		TCF	PIPFREE2	

L IMU MODE SWITCHING ROUTINES

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P0293 THE FOLLOWING ROUTINE TORGUES THE TRIGS ACCORDING TO DOUBLE PRECISION INPLTS IN THE SIX REGISTERS
 R0295 BEGINNING AT THE FCADR ARRIVING IN A. THE MINIMUM SIZE OF ANY PULSE TRAIN IS 16 PULSES (.25 CLK COUNTS). THE
 R0297 UNSENT PORTION OF THE COMMAND IS LEFT INTACT IN THE INPUT COMMAND REGISTERS.

0299				E3,147C		EBANK= 1400		VARIABLE, ACTUALLY.
0300	REF 793	LAST 1298	07,3315	54 161 0	IMUPULSE	TS	MPAC +5	SAVE ARRIVING ECADR.
0301	REF 5	LAST 1306	07,3316	0 3645 0	TC		CAGETSTJ	DONT PROCEED IF IMU BEING CAGED.
0302	REF 2	LAST 223	07,3317	11 311 1	CCS		LGYRC	SEE IF GYRCS BUSY.
0303	REF 1		07,3320	0 3361 0	TC		GYRDBUSY	SLEEP.
0304	REF 784	LAST 1305	07,3321	54 156 1	TS		MPAC +2	
0305	REF 55	LAST 1306	07,3322	3 4746 0	CAF		BIT6	ENABLE THE POWER SUPPLY.
0306			07,3323	0 0006 1	EXTEND			
0307	REF 18	LAST 1305	07,3324	05 014 1	WCR		CHAN14	
0308	REF 27	LAST 1275	07,3325	3 4751 0	CAF		FCUR	
0309	REF 44	LAST 1306	07,3326	6 5203 0	TC	GWAKE2	WAITLIST	(IF A JOB WAS PUT TO SLEEP, THE POWER
0310	REF 19	LAST 1306	E3,1474		ERANK=		CCUIND	SUPPLY IS LEFT ON BY THE WAKING JOB).
0312	REF 1		07,3327	03377 1	2CADR		STRTOGYRO	
0312	REF 1		07,3330	16103 1				
0313	REF 785	LAST 1309	07,3331	3 0161 1	CA		MPAC +5	SET UP EBANK, SAVING CALLER'S EBANK FOR
0314	REF 73	LAST 1275	07,3332	56 043 1	XCH		EBANK	RESTORATION ON RETURN.
0315	REF 786	LAST 1309	07,3333	56 161 1	XCH		MPAC +5	
0316	REF 3	LAST 1309	07,3334	55 1311 1	TS		LGYRD	RESERVES GYRCS.
0317	REF 17	LAST 1276	07,3335	7 4357 0	MASK		LCWR	
0318	REF 48	LAST 1304	07,3336	54 061 1	TS		ITEMP1	
0319	REF 84	LAST 1303	07,3337	3 4752 0	CAF		TWO	
0320	REF 787	LAST 1305	07,3340	54 157 0	TS	GYRCAGRE	MPAC +3	FORCE SIGN AGREEMENT ON INPLTS.
0321			07,3341	6 0000 1	DOUBLE			
0322	REF 49	LAST 1309	07,3342	6 0061 0	AD		ITEMP1	
0323	REF 788	LAST 1305	07,3343	54 160 1	TS		MPAC +4	
0324			07,3344	0 0006 1	EXTEND			
0325	REF 415	LAST 1308	07,3345	5 0000 1	INDEX		A	
0326			07,3346	3 1401 0	DCA		1400	
0327	REF 789	LAST 1305	07,3347	52 155 1	EXCH		MPAC	
0328	REF 15	LAST 1215	07,3350	0 7262 0	TC		TPAGREE	
0329	REF 790	LAST 1305	07,3351	52 155 1	EXCH		MPAC	
0330	REF 791	LAST 1305	07,3352	50 160 0	INDEX		MPAC +4	
0331			07,3353	53 1401 1	EXCH		1400	
0332	REF 792	LAST 1305	07,3354	10 157 1	CCS		MPAC +3	
0333	REF 1		07,3355	1 3340 1	TCF		GYRCAGRE	
0334	REF 793	LAST 1305	07,3356	3 0161 1	CA		MPAC +5	RESTORE CALLER'S EBANK.
0335	REF 74	LAST 1305	07,3357	54 013 0	TS		EBANK	
0336	REF 6	LAST 1308	07,3360	1 2747 0	TCF		MODEEXIT	

L TWO MORE SWITCHING ROUTINES.

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P0337 ROUTINES TO ALLOW TCEQUIP BY ONLY ONE JOB AT A TIME.

0338				07,3361	0 0006 1	GYROBUSY	EXTEND		SAVE RETURN 2FCADR.
0339	REF	22	LAST 1077	07,3362	3 0134 1	DCA	RUF2		
0340	REF	794	LAST 1309	07,3363	52 155 1	EXCH	MFAC		
0341	REF	1		07,3364	3 2376 0	REGSLEEP	CAF	LGWAKE	
0342	REF	5	LAST 1216	07,3365	1 5133 1	TCF	JCSLEEP		
0343	REF	4	LAST 1309	07,3366	11 311 1	GWAKE	CCS	LGYPD	WHEN AWAKENED, SEE IF GYROS STILL BUSY.
0344	REF	1		07,3367	1 3364 1	TCF	REGSLEEP		IF SO, SLEEP SOME MORE.
0345	REF	795	LAST 1310	07,3370	54 156 1	TS	MFAC +2		
0346				07,3371	0 0006 1	EXTEND			
0347	REF	796	LAST 1310	07,3372	3 0155 0	DCA	MFAC		
0348	REF	23	LAST 1310	07,3373	52 134 0	EXCH	RUF2		RESTORE SWRETURN INFO.
0349	REF	130	LAST 1295	07,3374	3 4753 1	CAF	CAF		
0350	REF	1		07,3375	1 3326 1	TCF	GWAKE2		
0351	REF	1		07,3376	17266 1	LGWAKE	CADF	GWAKE	

L IML MODE SWITCHING ROUTINES

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P0352 GYRO-TOGGLE WAITLIST TASKS.

0353	REF	1		07,3377	4 2620 1	STRTGYRO	CS	GDESELECT	DE-SELECT LAST GYRO.
0354				07,3400	0 0006 1		EXTEND		
0355	REF	19	LAST 1309	07,3411	03 014 1		WAND	CHAN14	
0356	REF	6	LAST 1306	07,3402	0 3633 1		TC	CACETEST	
0357	REF	5	LAST 1310	07,3403	3 1311 0	STPTGYR2	CA	LGYRO	JUMP CN PHASE COUNTER IN BITS 12-14.
0358				07,3404	0 0006 1		EXTEND		
0359	REF	40	LAST 1307	07,3405	7 4750 0		MP	BIT4	
0360	REF	416	LAST 1309	07,3406	50 000 1		INDEX	A	
0361				07,3407	1 3410 0		TCF	+1	
0362	REF	1		07,3410	0 3425 1		TC	GSELECT	=0. DC Y GYRO.
0363				07,3411	00202 1		CCT	00202	
0364	REF	2	LAST 1311	07,3412	0 3425 1		TC	GSELECT	=1. DC Z GYRO.
0365				07,3413	00302 0		CCT	00302	
0366	REF	3	LAST 1311	07,3414	0 3422 1		TC	GSELECT -2	=2. DC X GYRO.
0367				07,3415	00100 0		CCT	00100	
0368	REF	223	LAST 1308	07,3416	3 4755 1		CAF	ZERO	=3. DONE
0369	REF	6	LAST 1311	07,3417	55 0311 1		TS	LGYRO	
0370	REF	2	LAST 1310	07,3420	3 3376 0		CAF	LGWAKE	WAKE A POSSIBLE SLEEPING JCB.
0371	REF	6	LAST 1211	07,3421	0 5127 1		TC	JCBWAKE	
0372	REF	2	LAST 1306	07,3422	1 2224 1	NCRFSET	TCF	IMUFIND	DC NOT RESET POWER SUPPLY

L INU MODE SWITCHING ROUTINES

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0373	REF	28	LAST	1305	07,3423	4 4751 1	-2	CS	FCUF	SPECIAL ENTRY TO REGRESS LGYRC FOR X.
0374	REF	7	LAST	1311	07,3424	27 311 1		ADS	LGYRC	
0375	REF	25	LAST	1307	07,3425	50 012 1	GSELECT	INDEX	C	SELECT GYRC.
0376					07,3426	3 000 1		CAF	0	PACKED WORD CONTAINS GYFC SELECT BITS
0377	REF	12	LAST	1290	07,3427	54 064 1		TS	ITEMF4	AND INCREMENT TO LGYRC.
0378	REF	19	LAST	1282	07,3430	7 4757 1		MASK	SEVEN	
0379	REF	46	LAST	1317	07,3431	6 4737 0		AD	RIT13	
0380	REF	8	LAST	1312	07,3432	27 311 1		ADS	LGYRC	
0381	REF	75	LAST	1305	07,3433	54 013 0		TS	FRANK	
0382	REF	18	LAST	1305	07,3434	7 4357 0		MASK	LCW8	
0383	REF	51	LAST	1305	07,3435	54 061 1		TS	ITEMP1	
0384	REF	20	LAST	1312	07,3436	4 4757 1		CS	SEVEN	
0385	REF	13	LAST	1312	07,3437	7 0064 1		MASK	ITEMF4	
0386	REF	14	LAST	1312	07,3440	54 064 1		TS	ITEMP4	
0387					07,3441	0 0006 1		EXTEND		MOVE CP COMMAND TO RUPTREGS FOR TESTING.
0388	REF	51	LAST	1312	07,3442	5 0061 0		INDEX	ITEMF1	
0389					07,3443	3 1401 0		DCA	1400	
0390	REF	49	LAST	1290	07,3444	52 071 0		EXCF	RUPTREG1	
0391	REF	5	LAST	1312	07,3445	10 071 1		CCS	RUPTREG1	
0392	REF	1			07,3446	1 3461 0		TCF	MAJ+	
0393					07,3447	1 3451 0		TCF	+2	
0394	REF	1			07,3450	1 3601 1		TCF	MAJ-	
0395	REF	10	LAST	1290	07,3451	10 071 0		CCS	RUPTREG2	
0396	REF	1			07,3452	1 3456 1		TCF	MIN+	
0397	REF	1			07,3453	1 3403 1		TCF	STRGTYR2	
0398	REF	1			07,3454	1 3576 1		TCF	MIN-	
0399	REF	2	LAST	1312	07,3455	1 3403 1		TCF	STRGTYR2	

L IMC MODE SWITCHING ROUTINES

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0400	REF	1		07,3456	6 3512 1	MIN+	AC	-GYROMIN	SMALL POSITIVE COMMAND. SEE IF AT LEAST
0401				07,3457	0 0006 1		EXTEND		16 GYRO PULSES.
0402	REF	3	LAST 1312	07,3460	6 3413 0		BZMF	STRGCR2	
0403				07,3461	0 0006 1	MAJ+	EXTEND		DEFINITE POSITIVE OUTPUT.
0404	REF	1		07,3462	3 3522 1		DCA	GYROFRAC	
0405	REF	51	LAST 1312	07,3463	20 071 0		CAS	RUPTRREG1	
0406	REF	15	LAST 1312	07,3464	3 0064 0		CA	ITEMP4	SELECT POSITIVE TORQUING FOR THIS GYRO.
0407				07,3465	0 0006 1		EXTEND		
0408	REF	20	LAST 1311	07,3466	05 014 1		WCP	CHAN14	
0409	REF	10	LAST 1298	07,3467	3 6077 1		CAF	LCW7	LEAVE NUMBER OF POSSIBLE 8192 AUGMENTS
0410	REF	11	LAST 1312	07,3470	7 0071 0		MASK	RUPTRREG2	TO INITIAL COMMAND IN MAJOR PART OF LONG
0411	REF	12	LAST 1313	07,3471	56 071 1		XCF	RUPTRREG2	TERM STORAGE AND TRUNCATED FRACTION
0412				07,3472	1 0006 1	GMPEGE	EXTEND		IN MINCP PART. THE MAJOR PART WILL BE
0413	REF	4	LAST 1299	07,3473	7 4744 0		MP	BIT9	COUNTED DOWN TO ZERO IN THE COURSE OF
0414	REF	21	LAST 1290	07,3474	54 062 1		TS	ITEMP2	PUTTING OUT THE ENTIRE COMMAND.
0415	REF	52	LAST 1313	07,3475	3 0070 0		CA	RUPTRREG1	
0416				07,3476	0 0006 1		EXTEND		
0417	REF	28	LAST 1311	07,3477	7 4743 1		MP	BIT9	
0418	REF	53	LAST 1313	07,3500	54 070 1		TS	RUPTRREG1	
0419	REF	226	LAST 1302	07,3501	3 0001 0		CA	L	
0420				07,3502	0 0006 1		EXTEND		
0421	REF	71	LAST 1275	07,3503	7 4736 0		MP	BIT14	
0422	REF	22	LAST 1313	07,3504	26 062 1		ADS	ITEMP2	INITIAL COMMAND.
0423				07,3505	0 0006 1		EXTEND		SEE IF MORE THAN ONE PULSE TRAIN NEEDED
0424	REF	54	LAST 1313	07,3506	3 0071 1		DCA	RUPTRREG1	(MORE THAN 16283 PULSES).
0425	REF	1		07,3507	6 7752 0		AD	MINUS1	
0426	REF	417	LAST 1311	07,3510	10 000 0		CCS	A	
0427	REF	1		07,3511	1 3535 0		TCF	LCNGGYPC	
0428				07,3512	77611 0	-GYROMIN	CCT	-176	MAY BE ADJUSTED TO SPECIFY MINIMUM CMD
0429				07,3513	1 3517 0		TCF	+4	
0430	REF	72	LAST 1313	07,3514	3 4736 1		CAF	BIT14	
0431	REF	23	LAST 1313	07,3515	26 062 1		ACS	ITEMP2	
0432	REF	234	LAST 1311	07,3516	3 4755 1		CAF	ZERC	
0433	REF	52	LAST 1312	07,3517	50 061 0	+4	INDEX	ITEMP1	
0434				07,3520	53 041 1		CXCF	1400	

L IMU MODE SWITCHING ROUTINES

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0435	REF	24	LAST	1313	07,3521	3 062 0	CA	ITEMP2	ENTIRE COMMAND.
0436	REF	3	LAST	1305	07,3522	54 047 0	LASTSEG	TS	GYROCMD
0437					07,3523	0 0006 1		EXTEND	
0438	REF	43	LAST	1308	07,3524	7 4742 0	MP	BIT10	WAITLIST DT
0439	REF	37	LAST	1298	07,3525	6 6250 0	AD	TRFE	TRUNCATION AND PHASE UNCERTAINTIES.
0440	REF	45	LAST	1309	07,3526	0 5213 0	TC	WAITLIST	
0441	REF	20	LAST	1309	E3,1474		EBANK=	CCUIND	
0442	REF	2	LAST	1309	07,3527	03377 1	2CADR	STFTGYRO	
0442					07,3530	161 3 1			
0448	REF	44	LAST	1314	07,3531	3 4742 1	GYROEXIT	CAF	BIT10
0449					07,3532	0 0006 1		EXTEND	
0450	REF	21	LAST	1313	07,3533	05 114 1	WOR	CHAN14	
0451	REF	78	LAST	1307	07,3534	1 5261 0	TCF	TASKVER	
0452	REF	53	LAST	1313	07,3535	5 161 0	LONGGYRO	INDEX	ITEMP1
0453					07,3536	53141 1		EXCH	1400
0454	REF	72	LAST	1313	07,3537	3 4736 1	CAF	BIT14	INITIAL COMMAND CLT PLUS A DELAYS OF
0455	REF	25	LAST	1314	07,3540	6 0262 0	AD	ITEMP2	8192. INITIAL COMMAND IS AT LEAST E192.
0456	REF	4	LAST	1314	07,3541	54 047 0	TS	GYROCMD	
0457					07,3542	0 0016 1	AUG3	EXTEND	GET WAITLIST DT TO TIME WHEN TRAIN IS
0458	REF	45	LAST	1314	07,3543	7 4742 0		MP	ALMOST CLT.
0459	REF	4	LAST	1276	07,3544	6 7750 1		AD	NEG3
0460	REF	46	LAST	1314	07,3545	0 5202 0		TC	WAITLIST
0461	REF	21	LAST	1314	E3,1474			EBANK=	CCUIND
0462	REF	1			07,3546	03551 0		2CADR	8192AUG
0462	REF	1			07,3547	16103 1			
0463	REF	1			07,3550	1 3531 1		TCF	GYROEXIT
0464	REF	7	LAST	1311	07,3551	0 3633 1	8192AUG	TC	CACETIST
04641	REF	49	LAST	1311	07,3552	3 4750 1		CAF	BIT4
04642					07,3553	0 0016 1		EXTEND	
04643	REF	64	LAST	1277	07,3554	02 012 0		RAND	CHAN12
04644	REF	418	LAST	1313	07,3555	10 000 0		CCS	A
04645	REF	3	LAST	1204	07,3556	1 3621 1		TCF	IMUBAD
0465	REF	9	LAST	1312	07,3557	3 1311 0		CA	LGYRO
0466	REF	76	LAST	1212	07,3560	54 003 0		TS	EBANK
0467	REF	19	LAST	1312	07,3561	7 4257 0		MASK	LCW8
0468	REF	54	LAST	1314	07,3562	54 061 1		TS	ITEMP1
0469	REF	55	LAST	1314	07,3563	50 061 0		INDEX	ITEMP1
0470					07,3564	11140 0		CCS	1400
0471	REF	1			07,3565	1 3571 0		TCF	AUG2
0472	REF	74	LAST	1314	07,3566	3 4736 1		CAF	BIT14
0473	REF	5	LAST	1314	07,3567	26 047 0		ADS	GYROCMD
0474	REF	1			07,3570	1 3523 1		TCF	LASTSEG +1

L IMU MODE SWITCHING ROUTINES

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0475	REF	56	LAST 1314	07,3571	50 061 0	AUG2	INDEX	ITEMP1
0476				07,3572	55 4 13 0		TS	1470
0477	REF	75	LAST 1314	07,3573	2 4736 1		CAF	BIT14
0478	REF	6	LAST 1314	07,3574	26 047 0		ADS	GYROCMD
0479	REF	1		07,3575	1 3542 0		TCF	AUG3

COMPUTE DT.

L 1ML MODE SWITCHING ROUTINES

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0490	REF	2	LAST 1313	07,3576	6 3512 1	MIN-	AD	-GYRCMTN
0491				07,3577	0 3706 1		EXTEND	
0492	REF	4	LAST 1313	07,3600	6 3493 0		BZNF	STPTCYR2
0493				07,3601	0 3506 1	MAJ-	EXTEND	
0494	REF	2	LAST 1313	07,3602	4 3622 0		DCS	GYROFRAC
0495	REF	55	LAST 1313	07,3603	20 071 0		EAS	FLPTRFG1
0496	REF	16	LAST 1313	07,3604	3 0064 0		CA	1TEMP4
0497	REF	29	LAST 1313	07,3605	6 4743 0		AD	RIT9
0498				07,3606	0 0006 1		EXTEND	
0499	REF	22	LAST 1314	07,3607	05 014 1		WOR	CHAN14
0490	REF	56	LAST 1316	07,3610	4 0070 1		CS	PUPTRFG1
0491	REF	57	LAST 1316	07,3611	54 070 1		TS	RUPTRFG1
0492	REF	13	LAST 1313	07,3612	4 0071 0		CS	RUPTRFG2
0493	REF	11	LAST 1312	07,3613	7 6077 0		MASK	LEW7
0494				07,3614	4 0001 0		CCM	
0495	REF	14	LAST 1316	07,3615	56 071 1		XCF	PUPTRFG2
0496				07,3616	4 0000 0		CCM	
0497	REF	1		07,3617	1 3472 1		TCF	GNERGE
0499				07,3620	01700 1	GEFSELC	ECT	1700
0499				07,3621	01000 1	GYROFRAC	2DFC	.215 B -21
0499				07,3622	00034 0			

POSSIBLE NEGATIVE OUTPUT.

DEFINITE NEGATIVE OUTPUT.

SELECT NEGATIVE TORQUING FOR THIS CYRC.

SET UP PUPTRFGS TO FALL INTO GNERGE.
 ALL NUMBERS PUT INTO GYROCMD ARE
 POSITIVE - BITS OF CHAN 14 DETERMINES
 THE SIGN OF THE COMMAND.

TURN OFF SELECT AND ACTIVITY BITS.

L IMU MODE SWITCHING ROUTINES

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P0500 IMU MODE SWITCHING ROUTINES COME HERE WHEN ACTION COMPLETE.

0501				07,3623	0 0116 1	ENDIMU	EXTEND	
0502	REF	33	LAST 1108	07,3624	1 0111 1		READ	DSALWCLT
0503	REF	54	LAST 1308	07,3625	7 4753 0		MASK	BIT1
0504	REF	419	LAST 1314	07,3626	10 000 0		CCS	A
0505	REF	4	LAST 1314	07,3627	1 3631 1		TCF	IMUBAD
0506	REF	3	LAST 567	07,3630	1 3657 1	IMUGOOD	TCF	GOODEND
0507	REF	235	LAST 1312	07,3631	3 4755 1	IMLBAD	CAF	ZERO
0508	REF	2	LAST 567	07,3632	1 3654 1		TCF	BADEND
0509	REF	56	LAST 1309	07,3633	3 4746 0	CAGETEST	CAF	BIT6
0510	REF	64	LAST 1308	07,3634	7 1277 0		MASK	IMODES30
0511	REF	42	LAST 1317	07,3635	10 000 0		CCS	A
0512	REF	5	LAST 1317	07,3636	1 3631 1		TCF	IMLBAD
0513	REF	351	LAST 1312	07,3637	0 0002 0		TC	Q
0514	REF	65	LAST 1317	07,3640	4 1277 0	CAGETSTG	CS	IMODES30
0515	REF	57	LAST 1317	07,3641	7 4746 1		MASK	BIT6
0516	REF	421	LAST 1317	07,3642	10 000 0		CCS	A
0517	REF	252	LAST 1317	07,3643	24 002 0		INCR	C
0518	REF	353	LAST 1317	07,3644	0 0002 0		TC	Q
0519	REF	66	LAST 1317	07,3645	4 1277 0	CAGETSTJ	CS	IMODES30
0520	REF	58	LAST 1317	07,3646	7 4746 1		MASK	BIT6
0521	REF	422	LAST 1317	07,3647	10 000 0		CCS	A
0522	REF	354	LAST 1317	07,3650	0 0002 0		TC	Q
0523	REF	236	LAST 1317	07,3651	4 4755 0		CS	ZERO
0524	REF	4	LAST 1113	07,3652	551301 0		TS	IMUCANP
0525	REF	7	LAST 1309	07,3653	1 2747 0		TCF	MODEEXIT

MODE IS BAD IF CAGE HAS OCCURED OR IF
ISS WARNING IS ON.

WITH C(A) = 0.

SUBROUTINE TO TERMINATE IMU MODE
SWITCH IF IMU HAS BEEN CAGED.DIRECTLY.
WITH C(A) = +C.

SKIP IF IMU NOT BEING CAGED.

IF DURING MODE SWITCH INITIALIZATION
IT IS FOUND THAT THE IMU IS BEING CAGED,
SET IMUCADR TO -0 TO INDICATE OPERATION
COMPLETE BUT FAILED. RETURN IMMEDIATELY

TO SWRETURN.

L IML MODE SWITCHING ROUTINES

LSEP'S PAGE NO. 20 E3 S4

P0526 GENERALIZED MODE SWITCHING TERMINATION. ENTER AT GOODEND FOR SUCCESSFUL COMPLETION OF AN I/O OPERATION
 R0528 OR AT BADEND FOR A N UNSUCCESSFUL ONE. C(A) OR ARRIVAL =0 FOR IMU, 1 FOR OPTICS.

0530	REF	16	LAST	1316	07,3654	54 371 0	EACENT	TS	RUPTRREG2	DEVICE INDEX.
0531	REF	227	LAST	1317	07,3655	4 4755 0		CS	ZERO	FOR FAILURE.
0532	REF	4	LAST	1317	07,3656	1 3661 1		TCF	GOODEND +2	
0533	REF	16	LAST	1318	07,3657	54 071 0	GOODEND	TS	RUPTRREG2	
0534	REF	131	LAST	1318	07,3660	4 4753 0		CS	DAF	FOR SUCCESS.
0535	REF	13	LAST	1290	07,3661	54 372 0		TS	RUPTRREG3	
0536	REF	17	LAST	1318	07,3662	50 371 1		INDEX	RUPTRREG2	SEE IF USING PROGRAM ASLEEP.
0537	REF	6	LAST	945	07,3663	11 301 0		CCS	MCDECADR	
0538					07,3664	1 3670 1		TCF	+4	YES - WAKE IT UP.
0539	REF	1			07,3665	1 3700 1		TCF	ENDMODE	IF 0, PROGRAM NOT IN YET.
05392					07,3666	1 0006 1		EXTEND		
05394	REF	2	LAST	1318	07,3667	1 3701 0		BZF	ENDMODE +1	BZF = TCF IF MCDECADR = -0.
0540	REF	238	LAST	1318	07,3670	3 4755 1		CAF	ZERO	WAKE SLEEPING PROGRAM.
0541	REF	18	LAST	1318	07,3671	50 371 1		INDEX	RUPTRREG2	
0542	REF	7	LAST	1318	07,3672	57 361 1		XCF	MCDECADR	
0543	REF	7	LAST	1311	07,3673	0 5137 1		TC	JCRWAKE	
0544	REF	14	LAST	1318	07,3674	4 0072 0		CS	RUPTRREG3	ADVANCE LOC IF SUCCESSFUL.
0545	REF	23	LAST	1211	07,3675	50 364 0		INDEX	LCCCTR	
0546	REF	44	LAST	1257	07,3676	26 164 0		ADS	LCC	
0547	REF	79	LAST	1314	07,3677	1 5261 1		TCF	TASKOVER	
0548	REF	15	LAST	1318	07,3700	3 0072 1	ENDMODE	CA	RUPTRREG3	-0 INDICATES OPERATION COMPLETE BUT
0549	REF	19	LAST	1318	07,3701	50 371 1	+1	INDEX	RUPTRREG2	UNSUCCESSFUL: -1 INDICATES COMPLETE AND
0550	REF	8	LAST	1318	07,3702	55 201 0		TS	MCDECADR	SUCCESSFUL.
0551	REF	80	LAST	1318	07,3703	1 5261 0		TCF	TASKOVER	

L IMU MODE SWITCHING ROUTINES

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P0552 GENERAL STALLING ROUTINE. USING PROGRAMS COME HERE TO WAIT FOR I/O COMPLETION.

R0554 PROGRAM DESCRIPTION DATE- 21 FEB 1967
 R0555 LOG SECTION IMU MODE SWITCHING
 R0556 MOD BY- R. MELANSEN TO ADD DOCUMENTATION ASSEMBLY SUNDISK REV. E2

R0557 FUNCTIONAL DESCRIPTION-

R0558 TO DELAY FURTHER EXECUTION OF THE CALLING ROUTINE UNTIL ITS SELECTED
 R0559 I/O FUNCTION IS COMPLETE. THE FOLLOWING CHECKS ON THE CALLING ROUTINE'S
 R0560 MODECADR ARE MADE AND ACTED UPON.

- R0561 1) +0 INDICATES INCOMPLETE I/O OPERATION. CALLING ROUTINE IS PUT TO
 R0562 SLEEP.
 R0563 2) -1 INDICATES COMPLETED I/O OPERATION. STALL BYPASSES JOBSLEEP
 R0564 CALL AND RETURNS TO CALLING ROUTINE AT L+3
 R0565 3) -0 INDICATES COMPLETED I/O WITH FAILURE. STALL CLEARS MODECADR
 R0566 AND RETURNS TO CALLING ROUTINE AT L+2.
 R0567 4) VALUE GREATER THAN 0 INDICATES TWO ROUTINES CALLING FOR USE OF
 R0568 SAME DEVICE. STALL EXITS TO ABORT WHICH EXECUTES A PROGRAM
 R0569 RESTART WHICH IN TURN CLEARS ALL MODECADR REGISTERS.

R0570 CALLING SEQUENCE-

R0571 L TO BANKCALL
 R0572 L+1 CADR (ONE OF 5 STALL ADDRESSES I.E. IMSTALL, OPTSTALL, RADSTALL,
 R0573 ACTSTALL, OR ATTSTALL)

R0574 NORMAL-EXIT MODE-

R0575 TCF JOBSLEEP OR TCF MODEEXIT

R0576 ALARM OR ABORT EXIT MODE-

R0577 TC ABORT

R0578 OUTPUT-

R0579 MODECADR= CADR IF JOBSLEEP
 R0580 MODECADR=+0 IF I/O COMPLETE
 R0581 BUF2=L+3 IF I/O COMPLETE AND GOOD.
 R0582 BUF2=L+2 IF I/O COMPLETE BUT FAILED.

R0583 FRASABLE INITIALIZATION-

R0584 BUF2 CONTAINS RETURN ADDRESS PLUS 1, (L+2)
 R0585 BUF2+1 CONTAINS FBANK VALUE OF CALLING ROUTINE.
 R0586 MODECADR OF CALLING ROUTINE CONTAINS +0, -1, -0 OR CADR RETURN ADDRESS.

R0587 CTERIS-

R0588 RLPTRG2 AND CALLING ROUTINE MODECADR.

0589	REF 132	LAST 1318	07,3714	3 4783 1	ACTSTALL CAF	ONE	ACT.
0590	REF 1		07,3715	1 3711 0	TC	STALL	
0591	REF 85	LAST 1309	07,3716	3 4752 0	RADSTALL CAF	TWO	
0592	REF 2	LAST 1319	07,3717	1 3711 1	TCF	STALL	

L INL MCODE SWITCHING ROUTINES

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0593	REF	3	LAST	953	07,3704		CFTSTALL	EQUALS	ACTSTALL	
0594	REF	239	LAST	1318	07,3710	3 4755 1	IMSTALL	CAF	ZEPD	IML.
0595					07,3711	0 0004 0	STALL	INHINT		
0596	REF	20	LAST	1318	07,3712	54 71 0		TS	RUPTRG2	SAVE DEVICE INDEX.
0597	REF	423	LAST	1317	07,3713	50 002 1		INDEX	A	SEE IF OPERATION COMPLETE.
0598	REF	9	LAST	1318	07,3714	11'3'01 0		CCS	MODECADR	
0599	REF	1			07,3715	1 3723 1		TCF	MODABORT	ALLOWABLE STATES ARE +0, -1, AND -0.
0600	REF	1			07,3716	1 3727 1		TCF	MODESLP	OPERATION INCOMPLETE.
0601	REF	1			07,3717	1 3723 0		TCF	MODEGOOD	COMPLETE AND GOOD IF = -1.
0602	REF	21	LAST	1320	07,3720	50 071 1	MG2	INDEX	RUPTRG2	COMPLETE AND FAILED IF -0. RESET TO +0.
0603	REF	10	LAST	1320	07,3721	55'3'01 0		TS	MODECADR	RETURN TO CALLER.
0604	REF	8	LAST	1317	07,3722	1 2747 0		TCF	MODEEXIT	
0605	REF	424	LAST	1320	07,3723	10 002 0	MODEGOOD	CCS	A	MAKE SURE INITIAL STATE -1.
0606	REF	2	LAST	1320	07,3724	1 3733 1		TCF	MODABORT	
0607	REF	24	LAST	1310	07,3725	24 133 0		INCR	BUF2	IF SO, INCREMENT RETURN ADDRESS AND
0608	REF	1			07,3726	1 3720 0		TCF	MG2	RETURN IMMEDIATELY, SETTING CACR = +0.
0609	REF	13	LAST	930	07,3727	0 4645 1	MODESLP	TC	MAKECADR	CALL FROM SWITCHABLE FIXED ONLY.
0610	REF	22	LAST	1320	07,3730	50 071 1		INDEX	RUPTRG2	
0611	REF	11	LAST	1320	07,3731	55'3'01 0		TS	MODECADR	
0612	REF	6	LAST	1310	07,3732	1 5133 1		TCF	JCPSLEFP	
0613	REF	25	LAST	1320	07,3733	52 134 0	MODABORT	EXCH	BUF2	
06132	REF	6	LAST	1118	07,3734	0 5735 0		TC	BAILOUT1	TWO PROGRAMS USING THE SAME DEVICE.
0614					07,3735	31210 0		CCT	31210	

L IMU MODE SWITCHING ROUTINES

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P0615 CONSTANTS FOR MODE SWITCHING ROUTINES

0616	REF	4	LAST	964	5741		BITS384	=	OCT14	
0617	REF	3	LAST	1276	4771		BITS466	=	OCT50	
0618					07,3736	00001 1	BITS4-5	OCT	00030	
0619	REF	41	LAST	1313	4744		IMUSEFLG	EQUALS	BIT8	INTERPRETER SWITCH 7.
0620					07,3737	77500 1	-COMMAX	DEC	-191	
0621					07,3743	77477 0	-COMMAX-	DEC	-192	
0622	REF	4	LAST	945	07,3741	00074 1	6 DIMS	DEC	60	
0624	REF	4	LAST	370	07,3742	3 1304 1	INLEIN20	=	INUFINE	
0625					07,3743	0 0016 1	GENANUR	CA	ATTACDR	IS KALCMANL FREE
0626					07,3744	1 3746 0	EXTEND			
0627	REF	3	LAST	1321	07,3745	0 3733 0	BZF	+2		
0629					07,3746	0 0006 1	TC	MCNABORT		BAILOUT
0631	REF	26	LAST	1320	07,3747	3 0134 1	+2	EXTEND		
0632	REF	5	LAST	1321	07,3750	531315 1	DCA	BUF2		
							EXCH	ATTACDR		SAVE FINAL RETURN FOR KALCMAN3
0633	REF	43	LAST	1290	07,3751	3 0016 1	CA	BRANK		
0634	REF	21	LAST	1312	07,3752	7 4757 1	MASK	SEVEN		
0635	REF	6	LAST	1321	07,3753	271215 1	ADS	ATTACDR +1		
0642	REF	32	LAST	1105	07,3754	3 0167 1	CA	PRIORITY		
0643	REF	2	LAST	233	07,3755	7 7730 0	MASK	PRIC37		
0644	REF	2	LAST	370	07,3756	551306 1	TS	ATTAPIC		SAVE USEFS PRIC
06452	REF	1			07,3757	3 3763 0	CAF	KALFBCON		SET FBANK FOR KALCMAN3
06453	REF	77	LAST	1214	07,3760	54 0113 0	TS	FBANK		
06454	REF	57	LAST	1277	07,3761	0 4635 0	TC	PCSTJUMP		
06455	REF	1			07,3762	44004 0	CADR	KALCMAN3		
06456	REF	13	LAST	487	07,3762	03276 1	KALBCCN	ECADR		RECU

L IMU MODE SWITCHING ROUTINES

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0701	REF	6	LAST	975	04,3253	10070	ADRES	IMUSE
0702	REF	9	LAST	1308	04,3254	146310	TCF	SWRETURN
07025					04,3255	002201	OCT220	OCT 220

L IMU MODE SWITCHING ROUTINES

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P0703 PROGRAM DESCRIPTION P06 IOFEE67

R0714 TRANSFER THE ISS/CMC FROM THE OPERATE TO THE STANDBY CONDITION.

R0715 THE NORMAL CONDITION OF READINESS OF THE CMCS WHEN NOT IN USE IS STANDBY. IN THIS CONDITION THE IMU
R0717 HEATER POWER IS ON. THE IMU OPERATE POWER IS OFF. THE COMPUTER POWER IS ON. THE OPTICS POWER IS OFF. THE
R0719 CMC STANDBY ON THE MAIN AND LER DISKYS IS ON.

R0710 CALLING SEQUENCE:

R0711 ASTRONAUT REQUEST THROUGH DSKY V27E 06E.

R0712 SUBROUTINES CALLED:

R0713 GOPERF1

R0716 FANKCALL

R0719 FLAGDOWN

L IMU MODE SWITCHING ROUTINES

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R0810 PRESTAND PREPARES FOR STANDBY BY SNAPSHOTTING THE SCALER AND TIME1 TIME2
 R0811 THE LOW 5 BITS OF THE SCALER ARE INSPECTED TO INSURE COMPATIBILITY
 R0812 BETWEEN THE SCALER READING AND THE TIME1 TIME2 READING.

08125	RFF	1		37,2000		SETLCC PC5P06	
08126				37,2652		BANK	
0813	REF	2	LAST	99	0314	ERANK= TIME2SAV	
0814	REF	1				COUNT* \$1/P06	
08145	REF	72	LAST	1322	37,2652	0 5514 0	P06 TC UFFLAG SET NCCCV37 BIT
08146	REF	5	LAST	1201	37,3653	00054 0	ADRES NCCDFLAG
0815					37,3654	0 0004 0	PRESTAND INFINIT
0816					37,3655	0 0006 1	EXTEND
0817	REF	33	LAST	1297	37,3656	3 0025 0	ECA TIME2 SNAPSHOT TIME1TIME2
0818	REF	2	LAST	1325	37,3657	52 315 1	EXCH TIME2SAV
0819	REF	1			37,366	1 3711 0	TC SCALPREP
0820	REF	1			37,3661	0 3654 0	TC PRESTAND T1,T2,SCALER ACT COMPATIBLE
0821	REF	757	LAST	1310	37,3662	52 155 1	EXCH MFAC T1,T2 AND SCALER CK
0822	REF	1			37,3663	52 317 0	EXCH SCALSAVE STCRF SCALER
0823					37,3664	0 0014 0	INFINIT
0824	REF	302	LAST	1255	37,3665	0 4616 1	TC BANKCALL
0825	REF	3	LAST	177	37,3666	17157 1	CADR RNDREFDR REFSMM, DRIFT, TRACK FLAGS DOWN
0826	REF	98	LAST	1201	37,3667	0 5516 0	TC DCWNFLAG
0827	REF	7	LAST	1323	37,3670	000017 0	ADRES IMUSE IMUSE DOWN
08271	REF	59	LAST	1325	37,3671	0 5516 0	TC DCWNFLAG
08272	REF	7	LAST	821	37,3672	000010 0	ADRES RNDVZFLG RNDVZFLG DOWN
0828	REF	29	LAST	1301	37,3673	3 4741 1	CAP BIT11
0829					37,3674	0 0006 1	EXTEND
0830	REF	20	LAST	985	37,3675	05 0013 0	WOR CHAN13 SFT STANDBY ENABLE BIT
0831	REF	112	LAST	1233	37,3676	0 5353 1	TC PHASCHNG SET RESTART TO POSTAND WHEN STANDBY
0832					37,3677	07024 0	CCT 07024 RECOVERS
0833					37,3700	20000 0	CCT 20000
08335	REF	2	LAST	1325	0316		EBANK= SCALSAVE
0834	REF	1			37,3701	0 3721 1	2CADR PCSTAND
0834	REF	1			37,3712	76060 0	
0835	REF	1			37,3712	3 4774 1	CAP CCT62
0836	REF	303	LAST	1325	37,3714	0 4616 1	TC BANKCALL
0837	REF	10	LAST	964	37,3705	20624 0	CADR GCPERFI
0838					37,3706	1 3702 1	TCF -3
0839					37,37 7	1 3703 1	TCF -4
0840					37,3710	1 3703 1	TCF -5
08405	REF	3	LAST	602	4774		OCT62 EQUALS .5SEC DEC 50 = CCT 62

R0841 THE LOW 5 BITS OF THE SCALER READS 10000 FOR THE FIRST INTERVAL AFTER A

L IMU MODE SWITCHING ROUTINES

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R0842 T1 INCREMENT. IF SCALPREP DETECTS THIS INTERVAL THE T1,T2 AND SCALPREP
 R0843 DATA ARE NOT COMPATIBLE AND RETURN IS TO L+1 FOR ANOTHER READING OF THE
 R0844 DATA. OTHERWISE, THE RETURN IS TO L+2 TO PROCEED. ROUTINE ALSO PREPARES
 R0845 THE SCALER READING FOR COMPUTATION OF THE INCREMENT TO UPDATE T1T2. (THE
 R0846 10 MS BIT (BIT 6) OF THE SCALER IS INCREMENTED 5 MS OUT OF PHASE FROM
 R0847 T1.) ADDITION OF 5 MS (BIT 5) TO THE SCALER READING HAS THE EFFECT OF
 R0848 ADJUSTING BIT 6 IN THE SCALER TO BE IN PHASE WITH BIT 1 OF T1. THE LOW 5
 R0849 BITS OF THE SCALER READING ARE THEN SET TO ZERO, TO TRUNCATE THE SCALER
 R0850 DATA TO 10 MS. RESULTS ARE STORED IN MPAC, +1.

R0851			37,3711	0 0006 1	SCALPREP EXTEND		
R0852	REF 798	LAST 1325	37,3712	22 156 0	GXCH	MPAC +2	
R0853	REF 3	LAST 382	37,3713	0 4103 1	TC	FINETIME +1	
R0854			37,3714	0 0003 1	REFINT		
R0855	REF 799	LAST 1326	37,3715	52 155 1	DXCH	MPAC	
R0856	REF 43	LAST 1307	37,3716	3 4747 1	CA	BIT5	ADD 5 MS TO THE SCALER READING.
R0857	REF 237	LAST 1313	37,3717	54 001 1	TS	L	
R0858	REF 241	LAST 132	37,372	3 4755 1	CA	ZERO	
R0859	REF 800	LAST 1326	37,3721	20 155 1	CAS	MPAC	
R0860	REF 11	LAST 736	37,3722	4 4346 0	CS	LOW5	SET LOW 5 BITS OF (SCALER+5MS) TO ZERO
R0861	REF 801	LAST 1326	37,3723	7 0155 1	MASK	MPAC +1	AND STORE RESULTS IN MPAC,+1.
R0862	REF 802	LAST 1326	37,3724	56 155 0	XCH	MPAC +1	
R0863	REF 12	LAST 1326	37,3725	7 4346 0	MASK	LOW5	TEST LOW 5 BITS OF SCALER FOR THE FIRST
AOE64							INTERVAL AFTER THE T1 INCREMENT
AOE65							(INCR = 00000, SINCE BIT 5 ADDED).
R0866	REF 426	LAST 1322	37,3726	12 000 0	CCS	A	IS IT 1ST INTERVAL AFTER T1 INCREMENT
R0867	REF 803	LAST 1326	37,3727	24 156 0	INCR	MPAC +2	NO
R0868	REF 804	LAST 1326	37,3728	0 0156 0	TC	MPAC +2	YES

R0869 POSTAND RECOVERS TIME AFTER STANDBY. THE SCALER IS SNAPSHOTTED AND THE
 R0870 TIME1 TIME2 COUNTER IS SET TO ZERO. THE LOW 5 BITS OF THE SCALER ARE
 R0871 INSPECTED TO INSURE COMPATABILITY BETWEEN THE SCALER READING AND THE
 R0872 CLEARING OF THE TIME COUNT R. IT THEN COMPUTES THE DIFFERENCE IN SCALER
 R0873 VALUES (IN DP) AND ADDS THIS TO THE PREVIOUSLY SNAPSHOTTED VALUES OF
 R0874 TIME1 TIME2 AND PLACES THIS NEW TIME INTO THE TIME1 TIME2 COUNTER.

R0875	REF 1				COUNT# 14/P15		
R0876	REF 20	LAST 1325	37,3731	4 4741 0	POSTAND	CS	BIT11
R0877			37,3732	0 0006 1		EXTEND	RECOVER TIME AFTER STANDBY.
R0878	REF 21	LAST 1325	37,3733	03 013 0	WAND	CHAN13	CLEAR STANDBY ENABLE BIT
R0879			37,3734	0 0004 0		INHINT	
R0880	REF 241	LAST 1326	37,3735	3 4755 1	CA	ZERO	
R0881	REF 238	LAST 1326	37,3736	54 001 1	TS	L	
R0882	REF 34	LAST 1325	37,3737	52 025 1	DXCH	TIME2	CLEAR TIME1 TIME2
R0883	REF 2	LAST 1325	37,3740	0 3711 0	TC	SCALPREP	STORE SCALER IN MPAC, MPAC+1
R0884	REF 2	LAST 1325	37,3741	0 3734 1	TC	POSTAND +3	T1,T2, SCALER NOT COMPATIBLE
R0885			37,3742	0 0006 1		EXTEND	T1,T2 AND SCALER CK
R0886	REF 3	LAST 1325	37,3743	4 0317 1	CCS	SCALSAVE	
R0887	REF 805	LAST 1326	37,3744	20 155 1	CAS	MPAC	FORM OF DIFFERENCE OF POSTSTANLEY SCALER

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0888	REF	46	LAST	1314	37,3745	3 4742 1	CAF	BIT10	MINUS PRESTANDBY SCALER AND SHIFT RIGHT
0889	REF	11	LAST	877	37,3746	0 7312 0	TC	SHORTMP	5 TC ALIGN BITS WITH TIME1TIME2.
0890	REF	242	LAST	1326	37,3747	3 4755 1	CAF	ZERO	
0891	REF	806	LAST	1326	37,3750	54 156 1	TS	MPAC +2	NEEDED FOR TP AGREE
0892	REF	16	LAST	1309	37,3751	0 7262 0	TC	TPAGREE	MAKE CP DIFF AGREE
0893	REF	807	LAST	1327	37,3752	10 154 0	CCS	MPAC	
0894	REF	1			37,3753	0 3760 0	TC	POSTCCM	IF CP DIFF NET +, NO SCALER OVERFLOW
0895	REF	2	LAST	1327	37,3754	0 3760 0	TC	POSTCCM	BETWEEN PRE AND POST STANDBY.
0896					37,3755	0 3756 0	TC	+1	IF CP DIFF NET -, SCALER OVERFLOWED. ADD
0897	REF	47	LAST	1327	37,3756	3 4742 1	CAF	BIT10	BIT 10 TO HIGH DIFF TO CORRECT.
0898	REF	818	LAST	1327	37,3757	26 154 0	ACS	MPAC	
0899					37,3760	0 3906 1	POSTCCM	EXTEND	C(MPAC,+1) IS MAGNITUDE OF DELTA SCALER.
0900	REF	4	LAST	1325	37,3761	3 1315 0	DCA	TIME2SAV	PRESTANDBY TIME1TIME2
0901	REF	809	LAST	1327	37,3762	20 155 1	CAS	MPAC	
0902	REF	17	LAST	1327	37,3763	0 7262 0	TC	TPAGREE	FORCE SIGN AGREEMENT
0903	REF	810	LAST	1327	37,3764	52 155 1	EXCH	MPAC	UPDATED VALUE FOR T1,T2.
0904	REF	35	LAST	1326	37,3765	20 025 1	CAS	TIME2	LOAD UPDATED VALUE INTO T1,T2, WITH
09045	REF	108	LAST	1325	37,3766	0 5516 0	TC	DOWNFLAG	CLEAR ACCFLAG
09046	REF	6	LAST	1325	37,3767	0 0154 0	ADRES	NCOFLAG	
0905	REF	64	LAST	1322	37,3770	0 6001 0	TC	GCTCPCCH	

L KEYLEFT, UPRUPT

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0001				14,2775			EANK	14	
0002	PFF	1		14,2775			SETLCC	KEYRLPT	
0003				14,3256			BANK		
0004	PFF	1					CCLNT*	\$/KEYUP	
0005	RFF	9	LAST	1121	14,3256	54 016 1	KEYRUPT1	TS	BANKRLPT
0006	PFF	355	LAST	1317	14,3257	56 012 0	XCF	C	
0007	RFF	8	LAST	1121	14,3260	54 012 0	TS	GRAPT	
0008	RFF	2	LAST	440	14,3261	0 440 1	TC	LODSAMPT	
0009	RFF	13	LAST	1326	14,3262	3 4346 1	CAF	LCW5	
0010					14,3263	0 0016 1	EXTEND		
0011	RFF	2	LAST	215	14,3264	02 015 1	RAND	MNKEYIN	
0012	RFF	6	LAST	1290	14,3265	54 073 1	KEYCCM	TS	RLPTREG4
0013	RFF	29	LAST	908	14,3266	4 0101 0	CS	FLAGWRD5	
0014	RFF	1	LAST	1327	14,3267	7 4735 0	MASK	DSKYFEIT	
0015	RFF	20	LAST	1326	14,3270	26 101 0	ADS	FLAGWRD5	
0016	RFF	6	LAST	1091	14,3271	3 4355 0	ACCEPTUP	CAF	CHPRIN
0017	RFF	28	LAST	1258	14,3272	0 5072 1	TC	NCVAC	
0018	RFF	66	LAST	460	1776		EBANK=	DISPCLNT	
0019	RFF	1			14,3273	02077 0	2CADR	CHARIN	
0020	RFF	1			14,3274	60101 1			
0021	RFF	7	LAST	1328	14,3275	3 0173 0	CA	PLPTREG4	
0022	RFF	24	LAST	1318	14,3276	50 064 0	INDEX	LCCTP	
0023	RFF	811	LAST	1327	14,3277	54 154 0	TS	MFAC	
0023	RFF	22	LAST	986	14,3300	0 5270 1	TC	RESUME	

TIME IS SNATCHED IN RUPT FOR NOLN 65.

CHECK IF KEYS 5M-1M ON

(NOTE: RLPTREG4 = KEYTEMP1)

LEAVE 5 EIT KEY CDE IN MPAC FOR CHARIN

L KEYPUPT, UPRUPT

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PD024 UPRUPT PROGRAM

0025	REF	10	LAST	1328	04,3311	54 016 1	UPRUPT	TS	BANKRUPT	
0026	REF	354	LAST	1328	04,3312	56 012 0		XCH	Q	
0027	REF	9	LAST	1328	04,3313	54 012 0		TS	QRUPT	
0028	REF	3	LAST	1328	04,3314	0 4400 1		TC	LCDSAMPT	TIME IS SNATCHED IN RUPT FOR NOUN 65.
0029	REF	243	LAST	1327	04,3315	3 4755 1		CAF	ZERO	
0030	REF	2	LAST	223	04,3316	56 045 0		XCH	IALINK	
0031	REF	2	LAST	155	04,3317	54 073 1		TS	KEYTEMP1	
0032	REF	35	LAST	1275	04,3310	3 4751 0		CAF	BIT3	TURN ON (PACT LIGHT
0033					04,3311	0 0006 1		EXTEND		(BIT 3 OF CHANNEL 11)
0034	REF	34	LAST	1317	04,3312	05 011 1		WOP	DSALMCLT	
0035	REF	14	LAST	1328	04,3313	3 4346 1	UPRPT1	CAF	LOW5	TEST FOR TRIPLE CHAR REDUNDANCY
0036	REF	3	LAST	1329	04,3314	7 0073 1		MASK	KEYTEMP1	LCW5 OF WORD
0037	REF	4	LAST	1329	04,3315	56 073 0		XCH	KEYTEMP1	LOW5 INTO KEYTEMP1
0038					04,3316	0 0006 1		EXTEND		
0039	REF	48	LAST	1327	04,3317	7 4742 0		MP	BIT10	SHIFT RIGHT 5
0040	REF	1			04,3320	54 332 1		TS	KEYTEMP2	
0041	REF	15	LAST	1329	04,3321	7 4746 0		MASK	LCW5	MID 5
0042	REF	1			04,3322	6 3256 1		AD	HI10	
0043	REF	1			04,3323	0 3353 1		TC	UPTTEST	
0044	REF	40	LAST	1329	04,3324	3 4742 1		CAF	BIT10	
0045					04,3325	0 0006 1		EXTEND		
0046	REF	2	LAST	1329	04,3326	7 0332 1		MP	KEYTEMP2	SHIFT RIGHT 5
0047	REF	16	LAST	1329	04,3327	7 4346 0		MASK	LCW5	HIGH 5
0048					04,3330	4 0000 0		COM		
0049	REF	2	LAST	1329	04,3331	0 3353 1		TC	UPTTEST	
0051	REF	1			04,3332	4 3361 1	UPRK	CS	ELPCCOF	CODE IS GOOD. IF CODE = 'ERROR RESET',
0051	REF	5	LAST	1329	04,3333	6 0073 0		AC	KEYTEMP1	CLEAR UPLOCKFL (SET BIT4 OF FLAGWRD7 = 0)
0052					04,3334	0 0006 1		EXTEND		IF CODE DOES NOT = 'ERROR RESET', ACCEPT
0053	REF	1			04,3335	1 3343 1		BZF	CLUPLOCK	CODE ONLY IF UPLOCKFL IS CLEAR (=0).
0054	REF	1			04,3336	3 4750 1		CAF	UPLOCKBIT	TEST UPLOCKFL FOR 0 OR 1
0055	REF	26	LAST	891	04,3337	7 0113 1		MASK	FLAGWRD7	
0056	REF	427	LAST	1326	04,3340	10 0000 0		CCS	A	
0057	REF	23	LAST	1326	04,3341	0 5270 1		TC	RESUME	UPLOCKFL = 1
0058	REF	1			04,3342	0 3271 0		TC	ACCEPTUP	UPLOCKFL = 0
0059	REF	2	LAST	1329	04,3343	4 4750 0	CLUPLOCK	CS	UPLOCKBIT	CLEAR UPLOCKFL (I.E., SET BIT 4 OF)
0060	REF	27	LAST	1329	04,3344	7 0103 1		MASK	FLAGWRD7	FLAGWRD7 = 1)
0061	REF	28	LAST	1329	04,3345	54 103 1		TS	FLAGWRD7	
0062	REF	2	LAST	1329	04,3346	0 3271 0		TC	ACCEPTUP	
0063										
0064	REF	29	LAST	1329	04,3347	4 0103 1	TMFAIL2	CS	FLAGWRD7	CODE IS EAC
0065	REF	3	LAST	1329	04,3350	7 4750 0		MASK	UPLOCKBIT	LOCK OUT FURTHER UPLINK ACTIVITY
0066	REF	31	LAST	1329	04,3351	26 103 1		ADS	FLAGWRD7	
0067	REF	24	LAST	1329	04,3352	0 5270 1		TC	RESUME	'ERROR RESET' IS SENT VIA UPLINK.
0069	REF	4	LAST	1329	04,3353	6 0073 0	UPTEST	AD	KEYTEMP1	

L KEYRUPT, UPRUPT

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0070	REF 428	LAST 1329	04,3354	10 000 0	CCS	A
0071	REF 1		04,3355	0 3347 1	TC	TIMEFAIL2
0072			04,3356	77740 1	FILED	007
0073	REF 2	LAST 1330	04,3357	0 3347 1	TC	TIMEFAIL2
0074	REF 357	LAST 1329	04,3361	0 0 02 0	TC	C
0075			04,3361	00022 1	ELRCCOF	007 22

R0076 'UPLINK ACTIVITY LIGHT' IS TURNED OFF BY

R0077 1. VREFLESP
 R0078 2. ERROR RESET
 R0079 3. UPDATE PROGRAM(P27) ENTERED BY V70,V71,V72,AND V73.

R0081 THE RECEPTION OF A BAD CODE(I.E. CCC FAILURE) LOCKS OUT FURTHER UPLINK ACTIVITY BY SETTING BIT4 OF FLAGWORD7 = 1.
 R0083 THIS INDICATION WILL BE TRANSFERRED TO THE GROUND BY THE DOWNLINK WHICH DOWNLINKS ALL FLAGWORDS.
 R0085 WHEN UPLINK ACTIVITY IS LOCKED OUT, IT CAN BE ALLOWED WHEN THE GROUND UPLINKS AND 'ERROR RESET' CODE.
 R0087 (IT IS RECOMMENDED THAT THE 'ERROR LIGHT RESET' CODE IS PRECEDED BY 16 BITS THE FIRST OF WHICH IS 1 FOLLOWED
 R0089 BY 15 ZEROS. THIS WILL ELIMINATE EXTRANEOUS BITS FROM INLINK WHICH MAY HAVE BEEN LEFT OVER FROM THE ORIGINAL
 R0091 FAILURE)
 R0092 UPLINK ACTIVITY IS ALSO ALLOWED(UNLOCKED) DURING FRESH START WHEN FRESH START SETS BIT4 OF FLAGWORD7 = 0.

L DISPLAY INTERFACE ROUTINES

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R0001 DISPLAYS CAN BE CLASSIFIED INTO THE FOLLOWING CATEGORIES-

- R0002 1. PRIORITY DISPLAYS- DISPLAYS WHICH TAKE PRIORITY OVER ALL OTHER DISPLAYS. USUALLY THESE DISPLAYS ARE SENT
R0004 OUT UNDER CRITICAL ALARM CONDITIONS.
R0005 2. EXTENDED VERB DISPLAYS- ALL EXTENDED VERBS AND MARK ROUTINES SHOULD USE EXTENDED VERB (MARK) DISPLAYS.
R0007 3. NORMAL DISPLAYS- ALL MISSION PROGRAM DISPLAYS WHICH INTERFACE WITH THE ASTRONAUT DURING THE NORMAL
R0009 SEQUENCE OF EVENTS.
R0011 4. MISC. DISPLAYS- ALL DISPLAYS NOT HANDLED BY THE DISPLAY INTERFACEROUTINES. THESE INCLUDE SUCH DISPLAYS AS
R0012 WM DISPLAYS AND SPECIAL PURPOSE DISPLAYS HANDLED BY PINBALL.

R0013 5. ASTRONAUT INITIATED DISPLAYS- ALL DISPLAYS INITIATED EXTERNALLY.

R0014 THE FOLLOWING TERMS ARE USED TO DESCRIBE THE STATUS OF DISPLAYS-

- R0015 1. ACTIVE-THE DISPLAY WHICH IS (1) BEING DISPLAYED TO THE ASTRONAUT AND WAITING FOR A RESPONSE OR
R0017 (2) WAITING FIRST IN LINE FOR THE ASTRONAUT TO FINISH USING THE DSKY OR (3) BEING DISPLAYED ON THE DSKY
R0019 BUT NOT WAITING FOR A RESPONSE.
R0021 2. INACTIVE -A DISPLAY WHICH HAS (1) BEEN ACTIVE BUT WAS INTERRUPTED BY A DISPLAY OF HIGHER PRIORITY,
R0022 (2) BEEN PUT INTO THE WAITING LIST AT TIME IT WAS REQUESTED DUE TO THE FACT A HIGHER PRIORITY DISPLAY
R0024 WAS ALREADY GOING, (3) BEEN INTERRUPTED BY THE ASTRONAUT (CALLED A PINBRANCH CONDITION, SINCE THIS TYPE
R0026 OF INACTIVE DISPLAY IS USUALLY REACTIVATED ONLY BY PINBALL) OR (4) A DISPLAY WHICH HAS FINISHED BUT STILL
R0028 HAS TAPE SAVED FOR RESTART PURPOSES.

R0029 DISPLAY PRIORITIES WORK AS FOLLOWS-

R0030 INTERRUPTS-

- R0031 1. THE ASTRONAUT CAN INTERRUPT ANY DISPLAY WITH AN EXTERNAL DISPLAY REQUEST.
R0033 2. INTERNAL DISPLAYS CAN NOT BE SENT OUT WHEN THE ASTRONAUT IS USING THE DSKY.
R0035 3. PRIORITY DISPLAYS INTERRUPT ALL OTHER TYPES OF INTERNAL DISPLAYS. A PRIORITY DISPLAY INTERRUPTING ANOTHER
R0037 PRIORITY DISPLAY WILL CAUSE AN ABORT UNLESS BIT14 IS SET FOR THE LINUS ROUTINE.
R0039 4. A MARK DISPLAY INTERRUPTS ANY NORMAL DISPLAY.
R0040 5. A MARK THAT INTERRUPTS A MARK COMPLETELY REPLACES IT.

R0041 ORDER OF WAITING DISPLAYS-

- R0042 1. ASTRONAUT EXTERNAL USE
R0043 2. PRIORITY
R0044 3. INTERRUPTED MARK
R0045 4. INTERRUPTED NORMAL

R0046 5. MARK TO BE REQUESTED (SEE DESCRIPTION OF ENDMARK)
R0047 6. MARK WAITING
R0048 7. NORMAL WAITING

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R0049 THE DISPLAY ROUTINES ARE INTENDED TO SERVE AS AN INTERFACE BETWEEN THE USER AND FINBALL. THE
 R0051 FOLLOWING STATEMENTS CAN BE MADE ABOUT NORMAL DISPLAYS AND PRIORITY DISPLAYS (A DESCRIPTION OF MARK ROUTINES
 R0053 WILL FOLLOW LATER):

- R0054 1. ALL ROUTINES THAT END IN R HAVE AN IMMEDIATE RETURN TO THE USER. FOR ALL FLASHING DISPLAYS THIS RETURN
 R0056 IS TO THE USER'S CALL CADR +4. FOR THE ONLY NON FLASHING IMMEDIATE RETURN DISPLAY (GDCSPR) THIS RETURN
 R0058 IS TO THE USER'S CALLING LOC +1.
- R0059 2. ALL ROUTINES NOT ENDING IN R DO NOT DO AN IMMEDIATE RETURN TO THE USER.
- R0061 3. ALL ROUTINES THAT END IN P START A SEPARATE JOB (MAKEPLAY) WITH USER'S JOB PRIORITY.
- R0063 4. ALL ROUTINES NOT ENDING IN P BRANCH DIRECTLY TO MAKEPLAY WHICH MAKES THESE DISPLAYS A PART OF THE
 R0065 USER'S JOB.
- R0066 5. ALL DISPLAY ROUTINES ARE CALLED VIA BANKCALL.
- R0067 6. TO RESTART A DISPLAY THE USER WILL GENERALLY USE A PHASE OF ONE WITH DESIRED RESTART GROUP (SEE
 R0069 DESCRIPTION OF RESTARTS).
- R0070 7. ALL FLASHING DISPLAYS HAVE 3 RETURNS TO THE USER FROM ASTRONAUT RESPONSES. A TERMINATE (V34) BRANCHES
 R0072 TO THE USER'S CALL CADR +1. A PROCEED (V33) BRANCHES TO THE USER'S CALL CADR +2. AN ENTER OR RECYCLE
 R0074 (V32) BRANCHES TO THE USER'S CALL CADR +3.
- R0075 8. ALL ROUTINES MUST BE USED UNDER EXECUTIVE CONTROL.

R0076 A DESCRIPTION OF EACH ROUTINE WITH AN EXAMPLE FOLLOWS:

R0077 GDCSPR IS USED TO DISPLAY A VERB NOUN ARRIVING IN A. NO RETURN IS MADE TO THE USER.

- R0079 1. GDCSPR IS NOT RESTARTABLE
- R0081 2. A VERB PASTE WITH GDCSPR ALWAYS TURNS ON THE FLASH.
 A0081 CAF VXXNYY
 A0082 TC BANKCALL
 A0083 CADR GDCSPR

A0084 VXXNYY OCT OXXYY

P0085 GDCSPR IS THE SAME AS GDCSPR ONLY RETURN IS TO THE USER.

A0086 CAF VXXNYY
 A0087 TC BANKCALL
 A0088 CADR GDCSPR

A0089 IMMEDIATE RETURN OF GDCSPR

P0091 GDFLASH DISPLAYS A FLASHING VERB NOUN WITH NO IMMEDIATE RETURN TO THE USER. 3 RETURNS ARE POSSIBLE FROM
 R0092 THE ASTRONAUT (SEE PG. 7 ABOVE).

A0093 CAF VXXNYY VXX NYY WILL BE A FLASHING VERB NOUN.
 A0094 TC BANKCALL
 A0095 CADR GDFLASH
 A0096 TERMINATE RETURN
 A0097 PROCEED RETURN
 A0098 ENTER OR RECYCLE RETURN

R0099 G1PEPFI IS ENTERED WITH DESIRED CHECKLIST VALUE IN A. COPERFI WILL DISPLAY THIS VALUE IN RI BY MEANS OF A

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R0101 V01 N25.A FLASHING PLEASE PERFORM ON CHECKLIST (V50 N25) IS THEN DISPLAYED. NO IMMEDIATE RETURN IS MADE TO
 R0103 USER (SEE NO. 7 ABOVE).

R0104 GCPERF1 BLANKS REGISTERS R2 AND R3

AC105	CAF	OCTXX	CODE FOR CHECKLIST VALUE XX
A0106	TC	BANKCALL	
A0107	CADR	GCPERF1	
A0108	...	...	TERMINATE RETURN
A0109	...	...	PROCEED RETURN
A0110	...	...	ENTER RETURN

R0111 GCPERF2 IS ENTERED WITH A VARIABLE NOUN AND V01 (V00 FOR N10 OR N11) IN A. GCPERF2 WILL FIRST DISPLAY THE
 R0113 REQUESTED NOUN BY MEANS OF A V01NYY OR A V01NYY. PLEASE PERFORM ON NOUN (V50 NYY) THEN BECOMES A FLASHING
 R0115 DISPLAY. NO IMMEDIATE RETURN IS MADE TO THE USER (SEE NO. 7 ABOVE).

R0116 GCPERF2 DOES NOT BLANK ANY REGISTERS

A0117	CAF	VXXNYY	VARIABLE NOUN YY. XX=00 OR 01.
A0118	TC	BANKCALL	
A0119	CADR	GCPERF2	
A0120	...	...	TERMINATE RETURN
A0121	...	...	PROCEED RETURN
A0122	...	...	ENTER RETURN

R0123 GCPERF3 IS USED FOR A PLEASE PERFORM ON A PROGRAM NUMBER. THE DESIRED PROGRAM NO. IS ENTERED IN A. GCPERF3
 R0125 DISPLAYS THE NO. BY MEANS OF A V04N07 FOLLOWED BY A FLASHING V50 N07 FOR A PLEASE PERFORM. NO IMMEDIATE RETURN
 R0127 IS MADE TO THE USER (SEE NO. 7 ABOVE).

R0128 GCPERF3 BLANKS REGISTERS R2 AND R3

A0129	CAF	DECXX	REQUEST PERFORM ON PXX
A0130	TC	BANKCALL	
A0131	CADR	GCPERF3	
A0132	...	...	TERMINATE RETURN
A0133	...	...	PROCEED RETURN
A0134	...	...	ENTER RETURN

R0135 GCPERF4 IS USED FOR A PLEASE PERFORM ON AN OPTION. THE DESIRED OPTION IS ENTERED IN A AND STORED IN OPTCN1.
 R0137 GCPERF4 DISPLAYS R1 AND R2 BY MEANS OF A V04N06 FOLLOWED BY A FLASHING V50N06 FOR A PLEASE PERFORM. NO
 R0139 IMMEDIATE RETURN IS MADE TO THE USER (SEE NO. 7 ABOVE).

A0140	CAF	OCTXX	REQUEST PERFORM ON OPTION XX
A0141	TC	BANKCALL	
A0142	CADR	GCPERF4	
A0143	...	...	TERMINATE RETURN
A0144	PROCEED RETURN
A0145	ENTER RETURN

R0146 GCPERF4 BLANKS REGISTER R4

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R0147 GDCSPRT IS USED TO DISPLAY A VERB NOUN ARRIVING IN A WITH A RETURN TO THE USER AFTER THE DISPLAY HAS BEEN SENT
 R0149 OUT.

A0150 CAF VXXNYY
 A0151 TC BANKCALL
 A0152 CADR GDCSPRT

A0153 RETURN TO USER

R0154 REGODSP IS USED TO DISPLAY A VERB NOUN ARRIVING IN A. REGODSP IS THE SAME AS GDCSP ONLY REGODSP REPLACES ANY
 R0156 ACTIVE NORMAL DISPLAY IF ONE WAS ACTIVE.

A0157 CAF VXXNYY
 A0158 TC BANKCALL
 A0159 CADR REGODSP

R0160 REFLASH IS THE SAME AS GDCSP ONLY REFLASH REPLACES ANY ACTIVE NORMAL DISPLAY IF ONE WAS ACTIVE.

A0162 CAF VXXNYY VXX NYY WILL BE A FLASHING VERB NOUN
 A0163 TC BANKCALL
 A0164 CADR REFLASH
 A0165 TERMINATE RETURN
 A0166 PROCEED RETURN
 A0167 ENTER RETURN

R0168 GOFLASR IS SAME AS GDCSP ONLY AN IMMEDIATE RETURN IS MADE TO THE USERS CALL CADR +4.

A0170 CAF VXXNYY
 A0171 TC BANKCALL
 A0172 CADR GOFLASR
 A0173 TERMINATE RETURN
 A0174 PROCEED RETURN
 A0175 ENTER OR RECYCLE RETURN
 A0176 IMMEDIATE RETURN FROM GOFLASR

R0177 GORPERF1R IS THE SAME AS GORPERF1 ONLY GORPERF1R HAS AN IMMEDIATE RETURN TO USERS CALL CADR +4.

R0179 GORPERF1R BLANKS REGISTERS R2 AND R3

A0180 CAF CCTXX CCDE FOR CHECKLIST VALLE XX.
 A0181 TC BANKCALL
 A0182 CADR GORPERF1R
 A0183 TERMINATE RETURN
 A0184 PROCEED RETURN
 A0185 ENTER RETURN
 A0186 IMMEDIATE RETURN FROM GORPERF1R

R0187 GORPERF2R IS THE SAME AS GORPERF2 ONLY AN IMMEDIATE RETURN IS MADE TO USERS CALL CADR +4.

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R0189 GCPERF2R DOES NOT BLANK ANY REGISTERS

A0190	CAF	VXXNYY	VARIABLE NOUN YY REQUESTED. XX=00 OR 01
A0191	TC	BANKCALL	
A0192	CADR	GCPERF2R	
A0193	...	...	TERMINATE RETURN
A0194	...	...	PROCEED RETURN
A0195	...	...	ENTER RETURN
A0196	...	...	IMMEDIATE RETURN HERE FROM GCPERF2R

R0197 GCPERF3R IS THE SAME AS GCPERF3 ONLY AN IMMEDIATE RETURN IS MADE TO USERS CALL CADR +4.

P0195 GCPERF2R BLANKS REGISTERS R2 AND R3

A0200	CAF	PROGXX	PERFORM PROGRAM XX
A0201	TC	BANKCALL	
A0202	CADR	GCPERF3R	
A0203	...	...	TERMINATE RETURN
A0204	...	...	PROCEED RETURN
A0205	...	...	ENTER RETURN
A0206	...	...	GCPERF3R IMMEDIATELY RETURNS HERE

R0207 GCPERF4R IS THE SAME AS GCPERF4 ONLY AN IMMEDIATE RETURN IS MADE TO USERS CALL CADR +4.

A0209	CAF	OPTXX	REQUEST PERFORM ON OPTICXX
A0210	TC	BANKCALL	
A0211	CADR	GCPERF4R	
A0212	...	...	TERMINATE RETURN
A0213	...	...	PROCEED RETURN
A0214	...	...	ENTER RETURN
A0215	...	...	IMMEDIATE RETURN TO USER

R0216 GCPERF4R BLANKS REGISTER R3

R0217 REFLASR IS THE SAME AS REFLASH ONLY AN IMMEDIATE RETURN IS MADE TO THE USERS CALL CADR +4.

A0219	CAF	VXXNYY	VXX NYY WILL BE A FLASHING VERB NOUN
A0220	TC	BANKCALL	
A0221	CADR	REFLASR	
A0222	...	...	TERMINATE RETURN
A0223	...	...	PROCEED RETURN
A0224	...	...	ENTER RETURN
A0225	...	...	IMMEDIATE RETURN TO USER

R0226 PEGCODESR IS THE SAME AS PEGCODES ONLY A RETURN (IMMEDIATE) IS MADE TO THE USER.

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A0228

CAF

VXXNYY

A0229

TC

BANKCALL

A0230

CADR

PFGCESPR

A0231

...

...

IMMEDIATE RETURN TO USER

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R0232 GOMARK IS USED TO DISPLAY A MARK VERB NOUN ARRIVING IN A. NO RETURN IS MADE TO THE USER.

R0234 GCXDSP = GOMARK

A0235	CAF	VXXNYY	VXXNYY CONTAINS VERB AND NOUN
A0236	TC	BANKCALL	
A0237	CADR	GOMARK	OTHER EXTENDED VERBS USE CADR GCXDSP

R0238 GOMARKR IS THE SAME AS GOMARK ONLY RETURN IS TO THE USER.

R0239 GCXDSPR = GOMARKR

A0240	CAF	VXXNYY	
A0241	TC	BANKCALL	
A0242	CADR	GOMARKR	OTHER EXTENDED VERBS USE CADR GCXDSPR

A0243	IMMEDIATE RETURN OF GOMARKR
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R0244 GOMARKF DISPLAYS A FLASHING MARK VERB NOUN WITH NO IMMEDIATE RETURN TO THE USER. 3 RETURNS ARE POSSIBLE FROM THE ASTRONAUT (SEE NO. 7 ABOVE).

R0247 GCXDSPF = GOMARKF

A0248	CAF	VXXNYY	VXXNYY WILL BE A FLASHING MARK VERB NOUN
A0249	TC	BANKCALL	
A0250	CADR	GOMARKF	OTHER EXTENDED VERBS USE CADR GCXDSPF
A0251	...	...	TERMINATE RETURN
A0252	...	...	PROCEED RETURN
A0253	...	...	ENTER OR RECYCLE RETURN

R0254 GOMARKER IS THE SAME AS GOMARKF ONLY AN IMMEDIATE RETURN IS MADE TO THE USER CALL CADR +4.

R0256 GCXDSPER = GOMARKER

A0257	CAF	VXXNYY	FLASHING MARK VERB NOUN
A0258	TC	BANKCALL	
A0259	CADR	GOMARKER	OTHER EXTENDED VERBS USE CADR GCXDSPER
A0260	...	...	TERMINATE RETURN
A0261	...	...	PROCEED RETURN
A0262	...	...	ENTER OR RECYCLE RETURN
A0263	...	...	IMMEDIATE RETURN TO THE USER

R0264 GOMARK1 IS USED FOR A PLEASE PERFORM ON A MARK REQUEST WITH ONLY 1 ASTRONAUT RETURN TO THE USER. NO IMMEDIATE RETURN IS MADE. THE DESIRED MARK PLEASE PERFORM VERB AND DESIRED NOUN IS ENTERED IN A. GOMARK1 DISPLAYS R1, R2, R3 MEANS OF A VOSNYY FOLLOWED BY A FLASHING VEXNYY FOR A PLEASE PERFORM. THE ASTRONAUT WILL RESPOND WITH A MARK OR MARK REJECT OR AN ENTER. THE ENTER IS THE ONLY ASTRONAUT RESPONSE THAT WILL COME BACK TO THE USER.

A0272	CAF	V5XNYY	X=1,2,3,4 Y= NOUN
A0273	TC	BANKCALL	

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A0274	CADR	GEMARK1	
A0275	ENTER RETURN
R0276	*** IF BLANKING DESIRED ON ACR R ROUTINES, NOTIFY DISPLAYER.		
R0277	GEMARK1P IS THE SAME AS GEMARK1 ONLY AN IMMEDIATE RETURN IS MADE TO THE USERS CALL CADR +2.		
A0278	CAF	V5XNYY	X=1,2,3,4 YY=NCLN
A0280	TC	BANKCALL	
A0281	CADR	GEMARK1R	
A0282	...	...	ASTRONAUT ENTER RETURN
A0283	...	...	IMMEDIATE RETURN TO USER
R0284	GEMARK2 IS THE SAME AS GEMARK1 ONLY 3 RETURNS ARE MADE TO THE USER FROM THE ASTRONAUT.		
A0286	CAF	V5XNYY	X=1,2,3,4 YY=NCLN
A0287	TC	BANKCALL	
A0288	CADR	GEMARK2	
A0289	...	...	TERMINATE RETURN
A0290	...	...	PROCEED RETURN
A0291	...	...	ENTER RETURN
R0292	GEMARK2P IS THE SAME AS GEMARK1R ONLY 3 ASTRONAUT RETURNS ARE MADE TO THE USER.		
A0294	CAF	V5XNYY	X=0,1,2,3,4 YY=NCLN
A0295	TC	BANKCALL	
A0296	CADR	GEMARK2R	
A0297	...	...	TERMINATE RETURN
A0298	...	...	PROCEED RETURN
A0299	...	...	ENTER RETURN
A0300	...	...	IMMEDIATE RETURN TO THE USER
R0301	GEMARK3 IS USED FOR A PLEASE PERFORM ON A MARK REQUEST WITH A 3 COMF. DEC DISPLAY. THE DESIRED MARK PLEASE		
R0302	PERFORM VERP AND NCLN ARE ENTERED IN A. GEMARK3 DISPLAYS R1, R2, R3 BY MEANS OF A V5XNYY FOLLOWED BY A FLASHING		
R0303	V5XNYY FOR A PLEASE PERFORM. GEMARK3 HAS 3 ASTRONAUT RETURNS TO THE USER WITH AN IMMEDIATE RETURN.		
A0307	CAF	V5XNYY	X=1, 2,3,4 YY=NCLN
A0308	TC	BANKCALL	
A0309	CADR	GEMARK3	
A0310	...	...	TERMINATE RETURN
A0311	...	...	PROCEED RETURN
A0312	...	...	ENTER RETURN
R0313	GEMARK4 IS THE SAME AS GEMARK3 ONLY R2 AND R3 ARE BLANKED AND R1 IS DISPLAYED IN CCTL.		
A0315	CAF	V5XNYY	X=1,2,3,4 YY=NCLN
A0316	TC	BANKCALL	
A0317	CADR	GEMARK4	
A0318	TERMINATE RETURN
A0319	PROCEED RETURN

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A0320 ENTER RETURN

R0321 EXCSPRET IS USED TO DISPLAY A VERB NOUN ARRIVING IN A WITH A RETURN MADE TO THE USER AFTER THE DISPLAY HAS BEEN
R0323 SENT OUT.A0324 CAF VXXNYY
A0325 TC BANKCALL
A0326 CACF EXCSPRET

A0327 RETURN TO USER

R0328 KLEFNEX CLEANS OUT ALL MARK DISPLAYS (ACTIVE AND INACTIVE). A RETURN IS MADE TO THE USER AFTER THE MARK DISPLAYS
R0330 HAVE BEEN CLEANED OUT.A0331 TC BANKCALL
A0332 CACF KLEFNEX

A0333 RETURN TO USER

R0334 MARKBRAN IS A SPECIAL PURPOSE ROUTINE USED FOR SAVING JOB VAC AREAS (SEE DESCRIPTION OF MARKBRAN BELOW).

A0336 TC BANKCALL
A0337 CACF MARKBRAN

A0338 BAC RETURN IF MARK DISPLAY NOT ACTIVE

A0339 (GOOD RETURN TO IMMEDIATE RETURN LOG OF
A0340 LAST FLASHING MARK ROUTINE)R0341 PINBRNCH REESTABLISHES THE LAST ACTIVE FLASHING DISPLAY. IF THERE IS NO ACTIVE FLASHING DISPLAY, THE CDSKY IS
R0343 BLANKED AND CONTROL IS SENT TO ENDEJOB.A0344 TC POSTJUMP
A0345 CACF PINBRNCHR0346 PRIODSP IS USED AS A PRIORITY DISPLAY. IT WILL DISPLAY A GOFASH TYPE DISPLAY WITH THREE POSSIBLE RETURNS FROM
R0348 THE ASTONALT(SEE NO. 7 ABOVE).R0349 THE MAIN PURPOSE OF PRIODSP IS TO REPLACE THE PRESENT DISPLAY WITH A DISPLAY OF HIGHER PRIORITY AND TO
R0351 PROVIDE A MEANS FOR RESTORING THE OLD DISPLAY WHEN THE PRIORITY DISPLAY
R0352 IS RESPONDED TO BY THE ASTONALT.R0353 THE FORMER DISPLAY IS RESTORED BY AN AUTOMATIC BRANCH TO WAKE UP THE DISPLAY THAT WAS INTERRUPTED BY THE
R0355 PRIOD DISPLAY.A0356 CAF VXXNYY VXXNYY WILL BE A FLASHING VERB NOUN
A0357 TC BANKCALL
A0358 CACF PRIODSP
A0359 TERMINATE RETURN
A0360 PROCEED RETURN

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A0361	ENTER OR RECYCLE RETURN
R0362	PRICDSPR IS THE SAME AS PRICDSPONLY AN IMMEDIATE RETURN IS MADE TO THE USERS CALL CADR +4.		
A0364	CAF	VXXNYY	VXXNYY WILL BE A FLASHING VERB NOUN
A0365	TC	RANKCALL	
A0366	CADR	PRICDSPR	
A0367	...	...	TERMINATE RETURN
A0368	...	...	PROCEED RETURN
A0369	...	...	ENTER OR RECYCLE RETURN
A0370	...	...	IMMEDIATE RETURN
R0371	PRICLARM DOES A V05A09 PRICDSPR.		
R0372	CLEFANDSP CLEANS OUT ALL NORMAL DISPLAYS (ACTIVE AND INACTIVE). A RETURN IS MADE TO THE USER AFTER NORMAL		
R0374	DISPLAYS ARE CLEANED OUT.		
A0375	TC	RANKCALL	
A0376	CADR	CLEFANDSP	
A0377	RETURN TO USER

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R0378 GENERAL INFORMATION
R0379 -----

R0380 ALARM OR ABORT EXIT MODES--

A0381 PRIORITY TO ABORT
A0382 CCT 1502R0383 PRIORITY IS BRANCHED TO WHEN (1) A NORMAL DISPLAY IS REQUESTED AND ANOTHER NORMAL DISPLAY IS ALREADY ACTIVE
R0385 (REFLASH AND REGDSP ARE EXCEPTIONS) OR (2) A PRIORITY DISPLAY IS REQUESTED WHEN ANOTHER PRIORITY DISPLAY IS
R0387 ALREADY ACTIVE (A PRIORITY WITH LINUS BIT14 IS AN EXCEPTION).

R0388 FRASABLE INITIALIZATION REQUIRED--

R0389 ACCOMPLISHED BY FRESH START- 1. FLAGWRD4 (USED EXCLUSIVELY BY DISPLAY INTERFACE ROUTINES)
R0391 2. NVSAVE = NORMAL VERB AND NOUN REGISTER.
R0393 3. EBANKTEN = NORMAL INACTIVE FLAGWORD (ALSO CONTAINS NORMALS EBANK).R0395 5. R1SAVE = MARKBRAN CONTROL WORD
R0396 6. PESTREG = PRIORITY 3D AND SUPERBANK 3.
R0398 OUTPUT--R0399 NVWORD = PRIORITY VERB AND NOUN
R0400 NVWORD +1(MARKNV) = MARK VERB AND NOUN
R0401 NVWORD +2(NVSAVE) = NORMAL VERB AND NOUNR0402 CSPFLG(MARKSAV) = PRIORITY FLAGWORD (INCLUDING EBANK)
R0403 CSPFLG +1(MARKEBAN) = MARK FLAGWORD (INCLUDING EBANK)
R0404 CSPFLG +2(EBANKTEN) = NORMAL FLAGWORD (INCLUDING EBANK)R0405 CACRFLSH = PRIORITY USERS CALL CACR +1 LOCATION
R0406 CACRFLSH +1(MARKFLSH) = MARK USERS CALL CACR +1 LOCATION
R0407 CACRFLSH +2(TEMPFLSH) = NORMAL USERS CALL CACR +1 LOCATIONR0408 PRIORITY TIME = TIME EACH PRIORITY REQUEST FIRST SENT OUT
R0409 OPTION1 = DESIRED OPTION FROM GCPREF4
R0410 FLAGWRD4 = BIT INFO FOR CONTROL OF ALL DISPLAY ROUTINES
R0411 CSPTEN1 = BIT INFO FOR ALTERNATE FROM PERFORM DISPLAYS(NORMAL)
R0412 SUBROUTINES USED-- NVSUB, FLAGUP, FLAGDOWN, ENDJOB, PLANKSUB, ABORT, JOBWAKE, JOBSLEEP, FINDVAC, PRIORITY, JANTRY, NVSUBusy, FLASHON, ENDICL, CHANCL, BANKJUMP, MAKECACR, NOVAC,
R0415 DEFERIS-- (STORED INTO)R0416 TEMPORARY TEMPORARIES- A, Q, L, MPAC +2, MPAC +3, MPAC +4, MPAC +5, MPAC +6, RUPTREG2, RUPTREG3, CYL,
R0418 FBANK, RUPTREG4, LCC, BANKSET, NCP, MPAC, MPAC +1 4, FACEREG
R0420 CFASABES(SHARED AND USED WITH OTHER PROGRAMS) CACRSTCR, CSFLIST, LCC, CSPTEN1, OPTICN1

R0422 FRASABLES(USED ONLY BY DISPLAY ROUTINES)- NVWORD,+1,+2, CSPFLG,+1,+2, CACRFLSH,+1,+2, PRIORITY, FLAGWRD4,

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R0424 DISAVE, MARK2PAR,

R0425 DEERIS-- (USED BUT NOT STORED INTO)- ACUNPEG, VERPREG, LOCCTP, MONSAVEI

R0426 FLAGWORD DESCRIPTIONS--

R0427 FLAGWORD- SEE DESCRIPTION UNDER LOG SECTION ERASABLE ASSIGNMENTS

R0428 DSPFLG, DSPFLC+1, DSPFLG +2-

R0429 -----

R0430 BITS 1 BLANK P1

R0431 2 BLANK P2

R0432 3 BLANK P3

R0433 4 FLASHING DISPLAY REQUESTED

R0434 5 PERFORM DISPLAY REQUESTED

R0435 6 ----- EXDSPRET GOCSPRET

R0436 7 PRIOR DISPLAY -----

R0437 8 ----- DEC MARK PERFORM -----

R0438 9 FRANK

R0439 10 FRANK

R0440 11 FRANK

R0441 12 ----- V99PASTE

R0442 13 2ND PART OF PERFORM

R0443 14 REFLASH OR REFC ----- REFLASH OR RIDD

R0444 15 ----- MARK REQUEST -----

R0445 RESTARTING DISPLAYS--

R0446 ELLES FOR THE ESKY OPERATOR--

- R0447 1. PROCEED AND TERMINATE SERVE AS RESPONSES TO REQUESTS FOR OPERATOR RESPONSE (FLASHING V/N). AS LONG
 R0449 AS THERE IS ANY REQUEST AWAITING OPERATOR RESPONSE, ANY USE OF PROCEED OR TERMINATE WILL SERVE AS
 R0451 RESPONSES TO THAT REQUEST. CARE SHOULD BE EXERCISED IN ATTEMPTING TO KILL AN OPERATOR INITIATED MONITOR
 R0453 WITH PROCEED AND TERMINATE FOR THIS REASON.
- R0454 2. THE ASTRONAUT MUST RESPOND TO A PRIORITY DISPLAY NO. SCENE THAN 2 SECONDS FROM THE TIME THE
 R0456 PROGRAM SENT OUT THE REQUEST FOR OPERATOR RESPONSE (THE ASTRONAUT WOULD SEE THIS DISPLAY FOR LESS TIME
 R0458 DUE TO TIME IT TAKES TO GET DISPLAY SENT OUT.) IF THE ASTRONAUT RESPONDS TOO SOON, THE PRIORITY DISPLAY
 R0460 IS SENT OUT AGAIN -- AND AGAIN UNTIL AN ACCUMULATED 2 SECS FROM THE TIME THE FIRST PRIORITY DISPLAY
 R0462 OUT. THE SAME 2 SEC. DELAY WILL OCCUR AT 163.84 SECS OR IN ANY MULTIPLE OF THAT TIME DUE TO PROGRAM
 R0464 CONSIDERATION.
- R0465 3. KEY RELEASE BUTTON--
 R0466 A) IF THE KEY RELEASE LIGHT IS ON, IT SIMPLY RELEASES THE KEYBOARD AND DISPLAY FOR INTERNAL USE.
 R0468 B) IF THE KEY RELEASE LIGHT IS OFF, AND IF SOME REQUEST FOR OPERATOR RESPONSE (FLASHING V/N) IS STILL
 R0470 AWAITING RESPONSE THEN IT RE-ESTABLISHES THE DISPLAYS THAT ORIGINALLY REQUESTED RESPONSE.
 R0472 IF AN OPERATOR WANTS THEREFORE TO RE-ESTABLISH BUT CONDITION (A) IS ENCOUNTERED, A SECOND DEPRESSION OF
 R0474 KEY RELEASE BUTTON MAY BE NECESSARY.
- R0475 4. IT IS IMPORTANT TO ANSWER ALL REQUESTS FOR OPERATOR RESPONSE.
 R0476 5. IT IS ALWAYS GOOD PRACTICE TO TERMINATE AN EXTENDED VERB BEFORE ASKING FOR ANOTHER ONE OR THE SAME ONE
 R0478 OVER AGAIN.

R0479 SPECIAL CONSIDERATIONS--

L DISPLAY INTERFACE ROUTINES

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- R0480 1. MPAC +2 SAVED ONLY IN MARK DISPLAYS
R0481 2. GODSP(R), REGODSP(R), GCMARK(R) ALWAYS TURN ON THE FLASH IF ENTERED WITH A PASTE VERB REQUEST.
R0483 3. ALL NORMAL DISPLAYS ARE RESTARTABLE EXCEPT GODSP(R), REGODSP(R)
R0484 4. ALL EXTENDED VERBS WITH DISPLAYS SHOULD START WITH A TC TESTXACT AND FINISH WITH A TC ENDEX1.
R0486 5. GODSP(R) AND REGODSP(R) MUST BE IN THE SAME EBANK AND SUPERBANK AS THE LAST NORMAL DISPLAY RESTARTED
R0488 BY A .) RESTART PHASE CHANGE.
R0489 6. IN ORDER TO SET UP A NEW DISPLAY .1 RESTART PCINT, THE USER MUST MAKE CERTAIN THAT RESTREG CONTAINS THE
R0491 CORRECT PRIORITY AND SUPERBANK AND THAT EBANKTEM CONTAINS THE CC
R0491 7. IF CLEARFIS IS RESTARTED VIA A .1 PHASE CHANGE, CAF ZFPC SHOULD BE EXECUTED BEFORE THE TC BANKCALL.

L DISPLAY INTERFACE ROUTINES

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R0492 CALLING SEQUENCE FOR BLANKING
 A0493
 A0494
 A0495

CAF BITX
 TC BLANKET
 ...

X=1,2,3 BLANK R1,R2,R3 RESPECTIVELY
 RETURN TO USER HERE

R0496 IN ORDER TO USE BLANKET CORRECTLY THE USER MUST USE A DISPLAY ROUTINE THAT ENDS IN R FIRST FOLLOWED BY THE CALL
 R0496 TO BLANKET AT THE IMMEDIATE RETURN LCC.

0499 5464 BLOCK 02
 0500 REF 1 413 SETLCC FFTAG4
 0501 5464 BANK

0502 REF 1 COUNT* \$\$/DSPLA
 0503 REF 812 LAST 1328 5464 54 162 1 BLANKET TS MPAC +6
 0504 REF 1 5465 4 1160 1 CS PLAYTEM4
 0505 REF 813 LAST 1344 5466 7 1162 0 MASK MPAC +6
 0506 REF 814 LAST 1344 5467 51 161 1 INDSX MPAC +5
 0507 REF 2 LAST 1344 5470 26 160 1 ADS PLAYTEM4

0508 REF 358 LAST 1330 5471 0 0012 0 TC Q
 0511 REF 58 LAST 1321 5472 0 4635 0 ENDMARK TC POSTJUMP
 0512 REF 1 5473 20326 1 CACR MARKEND

05121 REF 244 LAST 1329 5474 3 4755 1 CLEARMRK CAF ZERO
 05122 REF 17 LAST 718 5475 551242 0 TS EXTVEACT

05123 5476 0 0004 0 +2 INHINT
 05124 REF 1 5477 4 4753 0 CS XDSPFIT
 05125 REF 5 LAST 477 5500 7 0100 1 MASK FLAGWRD4
 05126 REF 6 LAST 1344 5511 54 160 1 TS FLAGWRD4

05127 5502 0 0013 1 RELINT
 05128 REF 359 LAST 1744 5503 0 0002 0 TC Q
 P0513 ***ALL EXTENDED VREF ROUTINES THAT HAVE AT LEAST ONE FLASHING DISPLAY MUST TCF ENDMARK OR TCF ENDEXT WHEN
 R0515 FINISHED.

0516 10,2326 BANK 10
 0517 REF 1 10,2326 SETLCC DISPLAYS
 0518 10,2326 BANK

0519 REF 1 COUNT* \$\$/DSPLA
 R0520 ATERONLY IS USED TO DIFFERENTIATE THE MARK ROUTINE WITH ONLY ONE RETURN TO THE USER FROM THE MARKING ROUTINE WITH
 R0522 3 RETURNS TO THE USER. THIS ROUTINE IS ONLY USED BY GOMARK1 AND GOMARK1R.

05251 REF 2 LAST 226 10,2326 0 5474 0 MARKEND TC CLEARMRK
 05257 REF 1 10,2327 1 3422 1 TCF MARKCLR

0530 REF 1 10,2330 54 155 1 GOMARK TS PLAYTEM1 ENTRANCE FOR MARK GODESP

L DISPLAY INTERFACE ROUTINES

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0531	REF	45	LAST 1307	10,2331	3 4735 1	GCMARS	CAF	BIT15	EIT15 SET FOR ALL MARK REQUESTS
0532	REF	1		10,2332	1 2501 0		TCF	GDFLASH2	
0533	REF	245	LAST 1344	10,2333	3 4755 1	KLEFMAX	CAF	ZFRD	CLEAN CLT EXTENDED VERBS
0534	REF	2	LAST 1344	10,2334	54 155 1	GCMARKF	TS	PLAYTEM1	ENTRANCE FOR MARK GDFLASH
0535	REF	1		10,2335	3 3032 0		CAF	MARKFMSK	MARK, FLASH
0536	REF	2	LAST 1345	10,2336	1 2501 0		TCF	GDFLASH2	
0539	REF	3	LAST 1345	10,2337	54 155 1	GCMARK2	TS	PLAYTEM1	MARK GDFERES-3 AST. RETURN
0540	REF	1		10,2340	3 3521 1	MARKFCPM	CAF	MPERFMSK	MARK, PERFORM, FLASH
0541	REF	3	LAST 1345	10,2341	1 2501 0		TCF	GDFLASH2	
0542	REF	4	LAST 1345	10,2342	54 155 1	GCMARK3	TS	PLAYTEM1	USED FOR 300MF DECIMAL PERFORM
0543	REF	1		10,2343	3 3506 1		CAF	MARK3MSK	
0544	REF	4	LAST 1345	10,2344	1 2501 0		TCF	GDFLASH2	
0545	REF	5	LAST 1345	10,2345	54 155 1	GCMARK4	TS	PLAYTEM1	
0546	REF	1		10,2346	3 3507 0		CAF	MARK4MSK	MARK, PERFORM, FLASH, BLANK
0547	REF	5	LAST 1345	10,2347	1 2501 0		TCF	GDFLASH2	
0548	REF	6	LAST 1345	10,2350	54 155 1	GCMARKR	TS	PLAYTEM1	ENTRANCE FOR MARK GCDSPR
0549	REF	46	LAST 1345	10,2351	3 4735 1		CAF	BIT15	
0550	REF	1		10,2352	1 2454 1		TCF	GCDSPR2	
0551	REF	7	LAST 1345	10,2353	54 155 1	GCMARKER	TS	PLAYTEM1	ENTRANCE FOR MARK GDFLASH
0552	REF	2	LAST 1345	10,2354	3 3032 0		CAF	MARKFMSK	
0553	REF	1		10,2355	1 2640 0		TCF	GCDSPRS	
0559	REF	8	LAST 1345	10,2356	54 155 1	GCMARK2R	TS	PLAYTEM1	MARK GDFERES-3 AST. PETS+ IMMEDIATE RET.
0560	REF	2	LAST 1345	10,2357	3 3521 1		CAF	MPERFMSK	MARK, PERFORM, FLASH
0561	REF	2	LAST 1345	10,2360	1 2640 0		TCF	GCDSPRS	
056105	REF	3	LAST 1345	10,2361	6 5023 0	-1	AD	PRIC13	
05611	REF	9	LAST 1345	10,2362	54 155 1	GCMARK3R	TS	PLAYTEM1	
05612	REF	2	LAST 1345	10,2362	3 2506 1		CAF	MARK3MSK	
05613	REF	3	LAST 1345	10,2364	1 2640 0		TCF	GCDSPRS	
0562	REF	123	LAST 1319	10,2365	3 4753 1	MAKEMARK	CAF	CNE	
0563	REF	1		10,2366	0 2726 1		TC	CCPIES	
0564	REF	7	LAST 1344	10,2367	3 0110 0		CA	FLAGWPD4	IS NORM OR PRIC BUSY OF WAITING
0565	REF	1		10,2370	7 2522 0		MASK	QCT34300	
0566	REF	429	LAST 1339	10,2371	10 0000 0		CCS	A	
0567	REF	1		10,2372	1 2430 0		TCF	CHKPRIC	
0568	REF	8	LAST 1345	10,2373	3 0100 0		CA	FLAGWRD4	IS MARK SLEEPING DUE TO ASTRO BUSY
0569	REF	1		10,2374	7 4743 1		MASK	MRKNVBIT	

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0570			10,2375	0 0006 1	EXTEND		
0571	REF 1		10,2376	1 2410 0	EZF	MARKPLAY	NO
0572	REF 145	LAST 1201	10,2377	1 5155 1	TCF	ENDOFJOB	
0594			10,2400	0 0004 0	MARKPLAY	INHINT	
0595	REF 21	LAST 1275	10,2401	4 4756 0	CS	FIVE	RESET MARK OVER NORM, SET MARK
0596	REF 9	LAST 1345	10,2402	7 0100 1	MASK	FLAGWRD4	
05965	REF 134	LAST 1345	10,2403	6 4753 1	AD	ONE	
0597	REF 14	LAST 1346	10,2404	54 100 1	TS	FLAGWRD4	
0598			10,2405	0 0203 1	RELINT		
0600	REF 1		10,2406	4 1070 0	ECGOMARK	CS	MARKFLAG
0601	REF 44	LAST 1376	10,2407	7 4747 0	MASK	BITS	PERFORM
0601	REF 430	LAST 1345	10,2410	10 000 0	CCS	A	
0602	REF 1		10,2411	1 2414 0	TCF	MARKCOP	
0603	REF 1		10,2412	4 0270 1	CS	MARKNV	
0604	REF 2	LAST 1346	10,2413	54 370 1	TS	MARKNV	
0605	REF 135	LAST 1346	10,2414	3 4753 1	MARKCCF	CAF	ONE
0606	REF 1		10,2415	1 2617 1	TCF	PRICPLAY	MARK INDEX
0607	REF 1		10,2416	3 0165 0	COPYTCGC	CA	MPAC2SAV
0608	REF 815	LAST 1344	10,2417	54 156 1	TS	MPAC +2	
0609	REF 1		10,2420	50 164 1	COPYPACS	INDEX	COPINDEX
0610	REF 1		10,2421	3 3532 0	CAF	PRICCCT	
0611	REF 1		10,2422	54 162 0	TS	GENMASK	
0612	REF 2	LAST 1346	10,2423	50 164 1	INDEX	COPINDEX	
0613	REF 1		10,2424	3 1067 1	CAF	FRANKSAV	
0614	REF 1		10,2425	54 160 1	TS	TEMPCR2	ACTIVE EEANK AND FLAG
0615	REF 78	LAST 1321	10,2426	54 003 0	TS	EBANK	
0616	REF 260	LAST 1244	10,2427	0 0002 0	TC	C	
R0617	PINCHCK CHECKS TO SEE IF THE CURRENT MARK REQUEST IS MADE BY THE ASTRONAUT WHILE INTERRUPTING A GCPLAY DISPLAY						
R0618	(A NORMAL OR A PRIC). IF THE ASTRONAUT TRIES TO MARK DURING A PRIC, THE CHECK FAIL LIGHT GOES ON AND THE MARK						
R0621	REQUEST IS DEFER. IF HE TRIES TO MARK DURING A NORM, THE MARK IS ALLOWED. IN THIS CASE THE NORM IS PUT TO SLEEP						
R0623	UNTIL ALL MARKING IS FINISHED.						
R0624	IF THE MARK REQUEST COMES FROM THE PROGRAM DURING A TIME THE ASTRONAUT IS NOT INTERRUPTING A NORMAL OR A						
R0626	PRIC, THE MARK REQUEST IS PUT TO SLEEP UNTIL THE +PRESENT ACTIVE DISPLAY IS RESPONDED TO BY THE ASTRONAUT.						
0628	REF 11	LAST 1346	10,2430	3 0100 0	CHKPRIC	CAF	FLAGWRD4
0629	REF 1		10,2431	7 3255 1	MASK	OCT2410)	MARK ATTEMPT DURING PRIC
0630	REF 431	LAST 1346	10,2432	10 000 0	CCS	A	
0631	REF 1		10,2433	1 3455 1	TCF	MARSLEEP	

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0632	REF	12	LAST 1346	10,2434	4 0111 1	CS	FLAGWRD4	
0633	REF	1		10,2435	7 4751 1	MASK	MKCVET	SET MARK OVER NORM
0634				10,2436	0 0114 0	INHINT		
0635	REF	13	LAST 1347	10,2437	26 100 1	ACS	FLAGWRD4	
0636	REF	1		10,2440	1 2525 1	TCF	SFTNCRM	
0637	REF	3	LAST 1346	10,2441	3 037 0	MARKPERF	CA	MAPKNV
0638	REF	1		10,2442	7 4144 0	MASK	VEREMASK	
0639	REF	1		10,2443	1 2121 1	TCF	NV50DSP	
0640	REF	10	LAST 1345	10,2444	54 155 1	GCOSP	TS	PLAYTEM1
0641	REF	246	LAST 1345	10,2445	3 4755 1	GCOSP2	CAF	ZERO
0642	REF	6	LAST 1345	10,2446	1 2501 0	TCF	GOFLASH2	
0643	REF	11	LAST 1347	10,2447	54 155 1	GCOSPRET	TS	PLAYTEM1
								ENTRANCE FOR A GODSP WITH A PASTE
0644	REF	50	LAST 1317	10,2450	3 4746 0	CAF	BIT6	SET BIT6 TO GC BACK TO USER AFTER NVSUB
0645	REF	7	LAST 1347	10,2451	1 2501 0	TCF	GOFLASH2	
0646	REF	12	LAST 1347	10,2452	54 155 1	GCOSPR	TS	PLAYTEM1
0647	REF	247	LAST 1347	10,2453	3 4755 1	GCOSPR1	CAF	ZERO
0648	REF	3	LAST 1344	10,2454	54 155 1	GCOSPR2	TS	PLAYTEM4
0649	REF	248	LAST 1347	10,2455	3 4755 1	CAF	ZERO	* COUNT MCVF
0650	REF	1		10,2456	1 2642 1	TCF	GODSPRS1	

R0651 CLEAROSP IS USED FOR CLEARING OUT A NORMAL DISPLAY THAT IS PRESENTLY ACTIVE OR A NORMAL DISPLAY THAT IS
 R0653 SET UP TO BE STARTED OR RESTARTED.

R0654 NORMALLY THE USER WILL NOT NEED TO USE THIS ROUTINE SINCE A NEW NORMAL DISPLAY AUTOMATICALLY CLEARS OUT AN
 R0656 OLD DISPLAY.

R0657 CALLING SEQUENCE FOR CLEAROSP-

A0658						TC	BANKCALL	
A0659						CADR	CLEAROSP	
0660	REF	249	LAST 1347	10,2457	3 4755 1	CLEAROSP	CAF	ZERO
0661	REF	13	LAST 1347	10,2460	54 155 1	REFLASH	TS	PLAYTEM1
0662	REF	1		10,2461	3 2515 1	CAF	REDCMASK	FLASH AND PERMIT
0663	REF	8	LAST 1347	10,2462	1 2511 0	TCF	GOFLASH2	
0664	REF	14	LAST 1347	10,2463	54 155 1	REFLASHF	TS	PLAYTEM1
0665	REF	2	LAST 1347	10,2464	3 2515 1	CAF	REDCMASK	FLASH AND PERMIT
0666	REF	4	LAST 1345	10,2465	1 2640 0	TCF	GODSPRS	

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0667	REF	15	LAST	1347	10,2466	54 155 1	REGDCSP	TS	PLAYTEM1
0668	REF	76	LAST	1315	10,2467	3 4736 1	CAF	PIT14	
0669	REF	9	LAST	1347	10,2470	1 2511 0	TCF	GCFLASH2	
0670	REF	16	LAST	1348	10,2471	54 155 1	REGDCSP	TS	PLAYTEM1
0671	REF	77	LAST	1348	10,2472	3 4736 1	CAF	PIT14	
0672	REF	2	LAST	1345	10,2472	1 2454 1	TCF	GCDSR2	
06721	REF	17	LAST	1348	10,2474	54 155 1	CLOCKFLAY	TS	PLAYTEM1
06722	REF	1			10,2475	3 3544 1	CAF	CLOCKCON	
06723	REF	10	LAST	1348	10,2476	1 2511 0	TCF	GCFLASH2	
0673	REF	18	LAST	1348	10,2477	54 155 1	GCFLASH	TS	PLAYTEM1
0674	REF	51	LAST	1322	10,2500	3 4750 1	CAF	BIT14	
0675	REF	4	LAST	1347	10,2501	54 160 1	GCFLASH2	TS	PLAYTEM4
0676	REF	1			10,2502	0 2723 0	TC	SAVECCS	
0677					10,2503	0 0003 1	REFINT		
0678	REF	1			10,2504	1 2547 1	TCF	MAKEPLAY	
0679	REF	19	LAST	1348	10,2505	54 155 1	PRIODSP	TS	PLAYTEM1
0680	REF	1			10,2506	3 3524 1	CAF	BITS7+4	
0681	REF	5	LAST	1247	10,2507	1 2640 0	TCF	GCDSPE5	
0682	REF	20	LAST	1348	10,2510	54 155 1	PRIODSP	TS	PLAYTEM1
0683	REF	2	LAST	1348	10,2511	3 3524 1	SETPRIC	CAF	BITS7+4
0684	REF	11	LAST	1348	10,2512	1 2511 0	TCF	GCFLASH2	
0685	REF	251	LAST	1347	10,2513	3 4755 1	MAKEPRIC	CAF	ZERO
0686	REF	3	LAST	1346	10,2514	54 164 0	TS	CCPINDEX	
0687	REF	1			10,2515	0 3375 0	TC	LINUSCHR	
0688	REF	1			10,2516	1 2523 0	TCF	HIPRIC	
0689	REF	14	LAST	1347	10,2517	3 0100 0	CA	FLAGWRD4	
0690	REF	1			10,2520	7 3543 1	MASK	OUT20100	
0691	REF	432	LAST	1346	10,2521	10 000 0	CCS	A	
0692	REF	1			10,2522	1 2576 0	TCF	PRIOBCRT	
0693	REF	15	LAST	1348	10,2523	3 0100 0	HIPRIC	CA	FLAGWRD4
0694	REF	1			10,2524	7 5632 1	MASK	OUT41400	
0695					10,2525	0 0006 1	EXTEND		
0696	REF	1			10,2526	1 2531 0	BZF	ASKTFARM	

LEAVE ONLY FLASH BIT SET

BRANCH DIRECT WITH NO SEPARATE JOB CALL

LINUS RETURN

IS PRIC IN ENDTLE CP ELSY

YES, ABCRT

MAPK ACTIVE

NO

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0697	REF	251	LAST	1348	10,2527	3 4755	1	SFTMARK	CAF	ZERO	
0698	REF	1			10,2530	1 2775	1		TCF	JCBXCHS	
0699	REF	16	LAST	1348	10,2531	3 01 0 0		ASKJENRM	CA	FLAGWRD4	NCPMAL ACTIVE
0700	REF	1			10,2532	7 3541	0		MASK	CCT10200	BITS 13+8
0701					10,2533	0 00 16	1		EXTEND		
0702	REF	1			10,2534	1 2537	0		BZF	CKTOCCPY	NO
0703	REF	136	LAST	1346	10,2535	3 4753	1	SFTNCRM	CAF	ONE	
0704	REF	2	LAST	1345	10,2536	1 2775	1		TCF	JCBXCHS	
0705	REF	1			10,2537	0 2735	1	CKTOCCPY	TC	CCPYNCRM	
0706	REF	1			10,2540	0 3206	0		TC	WITCHCNE	
0707	REF	8	LAST	1318	10,2541	0 5137	1		TC	JCBWAKE	
0708	REF	1			10,2542	0 3223	1		TC	XCHTCEND	
0709	REF	2	LAST	1294	10,2543	3 0025	1	RFDGPRIC	CA	TIME1	SAVE TIME PRICESP SENT OUT
0710	REF	1			10,2544	55 164	1		TS	PRIOTIME	
0711	REF	252	LAST	1349	10,2545	3 4755	1	REFPPRIC	CAF	ZERO	START UP PRIO DISPLAY
0712	REF	2	LAST	1346	10,2546	1 2617	1		TCF	PRIOPLAY	
0713	REF	33	LAST	1321	10,2547	3 0167	1	MAKEPLAY	CA	PRIORITY	SAVE USERS PRIORITY
07131	REF	3	LAST	1321	10,2550	7 7730	0		MASK	PRIC37	
07132	REF	1			10,2551	54 163	1		TS	USERPRIC	
07133	REF	1			10,2552	3 7724	1		CAF	PRIC33	RAISE PRIORITY FOR FAST JCPS AFTER WAKE
07134	REF	17	LAST	888	10,2553	0 5146	1		TC	PRICCHAC	
07135	REF	5	LAST	1348	10,2554	3 0161	0		CA	PLAYTEM4	IS IT MARK OR PRIO OR NCRM
0714	REF	1			10,2555	7 3523	1		MASK	BITS15+7	
0715	REF	433	LAST	1348	10,2556	1 00 17	0		CCS	A	
0716	REF	1			10,2557	1 2513	0		TCF	MAKEPRIC	ITS PRIO
0717	REF	1			10,2560	1 2562	0		TCF	IFLEGAL	
0718	REF	1			10,2561	1 2365	1		TCF	MAKEMARK	ITS MARK
0719	REF	86	LAST	1319	10,2562	3 4752	0	IFLEGAL	CAF	TWO	
0720	REF	4	LAST	1348	10,2563	54 164	0		TS	CCPIINDEX	
0721	REF	2	LAST	1348	10,2564	0 3375	0		TC	LINUSCHR	
0722	REF	1			10,2565	1 2600	1		TCF	CKTCPLAY	LINUS RETURN
0723	REF	3	LAST	231	10,2566	4 1071	1		CS	EBANKTEM	
0724	REF	52	LAST	1348	10,2567	7 4750	0		MASK	BIT4	
0725	REF	434	LAST	1349	10,2570	10 00 00	0		CCS	A	
0726	REF	2	LAST	1349	10,2571	1 2600	1		TCF	CKTCPLAY	NO
0727	REF	17	LAST	1349	10,2572	3 0100	1		CA	FLAGWRD4	WAS NCRM ASLEEP

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0728	REF	1		10,2573	7 3514 1	MASK	NRUSMASK	ARE ANY NORMS ASLEEP
0729				10,2574	0 0006 1	EXTEND		
0730	REF	3	LAST 1349	10,2575	1 2600 1	BZF	OKTOPLAY	NC
0731	*REF	2	LAST 457	10,2576	0 5624 1	PRICBRT TC	RAILCUT	
0732	*			10,2577	31502 1	CCT	31502	
0733	REF	1		10,2600	0 2737 0	OKTOPLAY TC	COPIES2	
07331	REF	2	LAST 1349	10,2601	3 0163 0	CA	USERPRIC	
07332				10,2602	0 0016 1	EXTEND		
07333	REF	25	LAST 1285	10,2603	04 007 1	ROR	SUPERBNK	
07334	REF	3	LAST 228	10,2604	54 366 0	TS	RESTREG	
0737	REF	18	LAST 1349	10,2605	3 0100 0	CA	FLAGWRD4	PRIO CR MARK CCING
0738	REF	1		10,2606	7 3515 1	MASK	PMASK	
0739	REF	425	LAST 1349	10,2607	10 000 0	CCS	A	
0740	REF	1		10,2610	1 2755 0	TCF	GCSLEEPS	YES
0741				10,2611	1 2613 0	TCF	+2	
0742	REF	2	LAST 135	10,2612	1 2755 0	TCF	GCSLEEPS	MARK CCING
0743	COULD	PLT	NORM BUSY	CHECK	HERE	TO	SAVE	TIME
0744	REF	2	LAST 1349	10,2613	0 3206 0	TC	WITCHONE	IS IT AVSUE BUSY, ENICIDE CR NOCNE
0745	REF	5	LAST 1349	10,2614	0 5137 1	TC	JCBWAKE	
0746	REF	2	LAST 1349	10,2615	0 3223 1	TC	XCHTCEND	
0747	REF	37	LAST 1349	10,2616	3 4752 0	PLAYJUM1 CAF	TW	
0748	REF	5	LAST 1349	10,2617	54 164 0	PRIOPLAY TS	COPIINDEX	
0749	REF	1		10,2620	1 3071 0	TCF	GCPLAY	
0750	REF	21	LAST 1349	10,2621	54 155 1	EXDSPRET TS	PLAYTEM1	
0751	REF	1		10,2622	3 7737 0	CAF	RIT15+6	
0752	REF	12	LAST 1348	10,2623	1 2501 0	TCF	GCFLASH2	
0753	REF	2	LAST 939	10,2624	55 044 1	GOPERF1 TS	NORMTEM1	STORE DESIRED CHECKLIST VALUE
0754	REF	1		10,2625	3 2477 0	CAF	V01N25	USED TO DISPLAY CHECKLIST VALUE IN R1
0755	REF	22	LAST 1350	10,2626	54 155 1	GOPERFS TS	PLAYTEM1	
0756	REF	1		10,2627	3 3476 1	CAF	PERFMASK	LEAVE ONLY FLASH, PERFORM, PLANKING
0757	REF	13	LAST 1350	10,2630	1 2501 0	TCF	GCFLASH2	
0758	REF	23	LAST 1350	10,2631	54 155 1	GOPERF2 TS	PLAYTEM1	DESIRED VERB-NCUN TO DISPLAY P1,P2,P3
0759	REF	1		10,2632	3 3502 0	CAF	PERF2MSK	
0760	REF	14	LAST 1350	10,2633	1 2501 0	TCF	GCFLASH2	

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0764	REF	1		10,2634	0 2716 0	GOPRPF4	TC	PURPS4	
0765	REF	15	LAST 1350	10,2635	1 2501 0		TCF	GOFLASH2	
0766	REF	24	LAST 1350	10,2636	54 155 1	GOFLASHF	TS	PLAYTEM1	
0767	REF	53	LAST 1349	10,2637	3 4750 1		CAF	RIT4	LEAVE ONLY FLASH BIT SET
0768	REF	6	LAST 1349	10,2640	54 160 1	GDCSPRS	TS	PLAYTEM4	
0769	REF	38	LAST 1314	10,2641	3 6250 0		CAF	THREF	
0770				10,2642	0 0004 0	GDCSPRS1	INHINT		IMMEDIATE RETURN IS CALL CADR +4
0771	REF	16	LAST 1318	10,2643	54 072 0		TS	RUPTREG3	
0772	REF	24	LAST 1349	10,2644	3 0167 1		CA	PRIORITY	MAKE DISPLAY ONE HIGHER THAN USER
0773	REF	4	LAST 1349	10,2645	7 7730 0		MASK	PRI037	
0774	REF	11	LAST 1104	10,2646	54 063 0		TS	NEWPRIO	
07741	REF	7	LAST 1351	10,2647	3 0167 0		CA	PLAYTEM4	IS THIS A FLASHING R DISPLAY
07742	REF	54	LAST 1351	10,2650	7 4750 0		MASK	RIT4	
07743	REF	426	LAST 1350	10,2651	10 000 0		CCS	A	
07744	REF	1		10,2652	1 2660 1		TCF	VACDSP	YES, MAKE DISPLAY JOB A VAC
07745	REF	12	LAST 1351	10,2653	3 0063 1		CA	NEWPRIO	NO, MAKE DISPLAY JOB A NOVAC
07746	REF	29	LAST 1328	10,2654	0 5072 1		TC	NOVAC	
07747	REF	4	LAST 774	07,1471			FRANK=	WHOCARES	
07748	REF	2	LAST 1348	10,2655	02547 0		2CADR	MAKEFLAY	
07748				10,2656	20067 1				
07749	REF	1		10,2657	1 2666 1		TCF	BOTHJOBS	
0775	REF	44	LAST 1321	10,2660	3 0006 1	VACDSP	CA	BBANK	
0776				10,2661	1 0006 1		EXTEND		
0777	REF	26	LAST 1350	10,2662	04 007 1		RCR	SUPFRNK	
0778	REF	239	LAST 1326	10,2663	54 001 1		TS	L	
0779	REF	1		10,2664	3 3540 0		CAF	MAKEGFN	
0780	REF	3	LAST 370	10,2665	0 5116 1		TC	SFVAC	
0781	REF	2	LAST 1348	10,2666	0 2723 0	BOTHJOBS	TC	SAVELCOS	CCFY TEMPS INTO PERMANENT REGISTERS
0782				10,2667	0 0006 1		EXTEND		SAVE NVWORD AND USERS MPAC +2
0783	REF	816	LAST 1346	10,2670	3 0156 0		DCA	MPAC +1	
0784	REF	25	LAST 1328	10,2671	50 064 0		INDEX	LCCCTR	
0785	REF	817	LAST 1351	10,2672	52 156 1		DXCH	MPAC +1	
0786				10,2673	0 0006 1		EXTEND		SAVE USERS CADR, FLAGS AND EBANK
0787	REF	818	LAST 1351	10,2674	3 0160 0		DCA	MPAC +3	
0788	REF	26	LAST 1351	10,2675	50 064 0		INDEX	LCCCTR	
0789	REF	819	LAST 1351	10,2676	52 160 1		DXCH	MPAC +3	
0790	REF	27	LAST 1351	10,2677	3 0064 0		CA	LCCCTR	
0791	REF	820	LAST 1351	10,2678	54 161 0		TS	MPAC +5	

L	DISPLAY	INT	PEACE	ROUTINES		TC	SAVE	CCP	USER'S PAGE NO.	22	EO S3
0792	REF	1		10,2701	0 2730 1	TC	SAVE	LCCP			
0793				10,2702	0 0003 1	REFLINT					
0794	PEF	17	LAST 1284	10,2703	1 4640 0	TCF	BANKJUMP		CALL	CADR +4	
0795	REF	3	LAST 1350	10,2704	55 044 1	GCPERF1R	TS	NORMTEM1	DESIRED	CHECKLIST VALUE	
0796	PEF	2	LAST 1350	10,2705	3 3477 0	CAF	VCIN25		DISPLAYS	CHECKLIST VALUE IN R1	
0797	PEF	25	LAST 1351	10,2706	54 155 1	GCPERFRS	TS	PLAYTEM1			
0798	PEF	2	LAST 1350	10,2707	3 3476 1	CAF	PERF2MSK		LEAVE	ONLY FLASH, PERF2CM, BLANKING	
0799	REF	6	LAST 1348	10,2710	1 2640 0	TCF	GCDSPPS				
0800	REF	26	LAST 1352	10,2711	54 155 1	GCPERF2R	TS	PLAYTFM1	DESIRE	VERB-ACUN TO DISPLAY R1,R2,R3	
0801	REF	2	LAST 1350	10,2712	3 3512 0	CAF	PERF2MSK				
0802	REF	7	LAST 1352	10,2713	1 2640 0	TCF	GCDSPPS				
0806	REF	2	LAST 1351	10,2714	0 2716 0	GCPERF4P	TC	PLRPS4			
0807	REF	8	LAST 1352	10,2715	1 2640 0	TCF	GCDSPPS				
0808	REF	7	LAST 968	10,2716	55 143 1	PLRRS4	TS	OPTICN1	DESIRE	OPTION CODE	
0809	REF	1		10,2717	3 3503 1	CAF	VC4N06				
0810	PEF	27	LAST 1352	10,2720	54 155 1	TS	PLAYTFM1				
0811	REF	1		10,2721	3 3504 0	CAF	PERF4MSK		FLASH, PERF2CM	AND BLANK R3	
0812	REF	361	LAST 1346	10,2722	0 0002 0	TC	Q				
0813				10,2723	0 0004 0	SAVE	LCCS	INFINT			
0815	REF	1		10,2724	4 2513 1	CS	QCT3400		CRANK	BITS	
0816	REF	8	LAST 1351	10,2725	7 0160 1	MASK	PLAYTFM4				
0817	REF	79	LAST 1346	10,2726	6 0003 1	AC	EEBANK				
0818	PEF	9	LAST 1352	10,2727	54 160 1	TS	PLAYTFM4				
0819	REF	362	LAST 1352	10,2730	22 002 0	SAVE	LCCR	LXCH	Q		
0820	REF	14	LAST 1320	10,2731	0 4645 1	TC	MAKEQADR				
0821	REF	1		10,2732	54 157 0	TS	PLAYTFM2				
0822	REF	17	LAST 1351	10,2733	6 0072 1	AC	RUPTRFG3		NOT	USED FOR NON R ROUTINES	
0823	REF	240	LAST 1351	10,2734	0 0001 0	TC	L				
0824	REF	253	LAST 1349	10,2735	3 4755 1	CCPYNCRM	CAF	ZERO			
0825	REF	6	LAST 1350	10,2736	54 164 0	COPIES	TS	CCPINDEX			
0826				10,2737	0 0014 0	COPIES2	INHINT				
0827	REF	10	LAST 1352	10,2740	3 0160 0	CA	PLAYTFM4		FLAGWORD		

L DISPLAY INTERFACE ROUTINES

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0828	REF	7	LAST 1352	10,2741	50 164 1		INDEX	COPINDEX	
0829	REF	2	LAST 1246	10,2742	55 007 0		TS	FBANKSAV	EQUIV TO DSPFLG
0830	REF	1		10,2742	7 3521 1		MASK	CADRMASK	FLASH AND EDCSPRET
0831				10,2744	0 0076 1		EXTEND		
0832	REF	1		10,2745	1 2751 1		EZF	SKIPADD	
0833	REF	2	LAST 1352	10,2746	3 0157 1		CA	PLAYTFM3	
0834	REF	8	LAST 1353	10,2747	50 164 1		INDEX	CCPINDEX	
0835	REF	2	LAST 1354	10,2750	54 272 0		TS	CADRFLSH	
0836	REF	28	LAST 1352	10,2751	3 0155 0	SKIPADD	CA	PLAYTFM1	VERR ACCLN
0837	REF	9	LAST 1353	10,2752	50 164 1		INDEX	CCPINDEX	
0838	REF	2	LAST 737	10,2753	54 367 1		TS	NVWORD	
0840	REF	1		10,2754	1 3232 0		TCF	RELINTQ	
0843	REF	10	LAST 1353	10,2755	50 164 1	GCLEFFPS	INDEX	CCPINDEX	
0844	REF	2	LAST 1346	10,2756	3 3522 0		CA	PRICCT	
0845	REF	1		10,2757	7 2761 1		MASK	WAITMASK	
0846	REF	1		10,2760	0 3545 0		TC	UPENT2	
0847				10,2761	0 3004 0	WAITMASK	CCT	3004	
0848	REF	127	LAST 1349	10,2762	4 4753 0		CS	CNE	
0849	REF	11	LAST 1353	10,2763	6 0164 1		AD	CCPINDEX	
0850	REF	1		10,2764	54 154 0		TS	FACEREG	
0851	REF	2	LAST 1353	10,2765	50 154 1	XCHSLEFF	INDEX	FACEREG	
0852	REF	1		10,2766	3 3511 1		CAF	WAKECADR	
0853				10,2767	0 0014 0		INFINIT		
0854	REF	10	LAST 1350	10,2770	0 5137 1		TC	JCBWAKE	FIND CADR IN JOE AREA
0855	REF	3	LAST 1351	10,2771	0 3223 1		TC	XCHTOFND	CAUSES AWAKENED JCB TO GO TO ENDCFJCB
0858	REF	2	LAST 1353	10,2772	50 154 1		INDEX	FACEREG	
0859	REF	2	LAST 1353	10,2773	3 3511 1		CAF	WAKECADR	REPLACE SAME CADR BUT NEW JOE AREA
0860	REF	7	LAST 1320	10,2774	1 5133 1		TCF	JCBLSLEPP	
0861	REF	4	LAST 1353	10,2775	54 154 0	JCBXCHS	TS	FACEREG	CENTRCLS TYPE OF DISPLAY PUT TO SLEEP
0862	REF	3	LAST 1350	10,2776	0 3206 0		TC	WITCHENF	
0863	REF	11	LAST 1353	10,2777	0 5137 1		TC	JCBWAKE	
0864	REF	5	LAST 1353	10,3000	3 0154 1		CA	FACEREG	
0865	REF	28	LAST 1351	10,3001	50 164 0		INDEX	LOCCTR	
0866	REF	6	LAST 1353	10,3002	54 154 0		TS	FACEREG	
0867	REF	1		10,3003	3 3016 0		CAF	XCHQADD	
0868	REF	1		10,3004	0 3224 0		TC	XCHNYLOC	
0869	REF	7	LAST 1353	10,3005	50 154 1		INDEX	FACEREG	
0870	REF	1		10,3006	3 3523 1		CA	MARKCCT	
0871	REF	1		10,3007	7 3535 0		MASK	TDLISLEP	

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0872	REF	1		10,3010	1 2555 1	TC	DOWNENT2	
0873				10,3011	74004 0	IDLEMASK	CCT	74104 * CONT MOVE
0874	REF	8	LAST 1353	10,3012	50 154 1	INDEX	FACEREG	BIT SHOWS PRIO INTERRUPTED NORM OR MARK
0875	REF	45	LAST 1346	10,3013	3 4747 1	CA	BIT5	BITS FOR MARK, BIT4 FOR NORMAL
0876	REF	29	LAST 1312	10,3014	6 4751 0	AD	FOUR	
0877	REF	2	LAST 1353	10,3015	1 2545 0	TC	UPENT2	FLAG ROUTINE OCCES RELINT
0878	REF	1		10,3016	02765 1	XCHQADE	CFMADR	XCHSLDPE * CONT MOVE
0879	REF	19	LAST 1350	10,3017	3 0100 0	CA	FLAGWRD4	
0880	REF	2	LAST 1347	10,3020	7 4751 1	MASK	MARKVRIT	MARK CVER NORM ?
0881	REF	427	LAST 1351	10,3021	10 000 0	CFS	A	
0882	REF	2	LAST 1346	10,3022	0 24 0 1	GENMARK	TC	MARKPLAY USED AS GENADR FOR JOEWAKE
0883	REF	2	LAST 1349	10,3023	1 2537 0	TCF	MARKCOPY	
0884	REF	254	LAST 1352	10,3024	3 4755 1	MARKWAKE	CAF	ZERO
0885	REF	2	LAST 1346	10,3025	54 160 1	WAKEPLAY	TS	TEMPER2
0886	REF	3	LAST 1354	10,3026	50 160 0	INDEX	TEMPOR2	
0887	REF	1		10,3027	3 3525 0	CA	BIT5+11	
0888	REF	31	LAST 1354	10,3030	6 4751 0	AD	FOUR	
0889	REF	2	LAST 1354	10,3031	0 3555 1	TC	DOWNENT2	
0890	REF			10,3032	40010 1	MARKENSK	CCT	40010 ***CONT MOVE
0891	REF	4	LAST 1354	10,3033	50 160 0	INDEX	TEMPOR2	
0892	REF	3	LAST 1353	10,3034	3 3511 1	CAF	WAKECAEP	
0893				10,3035	0 0004 0	INHINT		
0894	REF	12	LAST 1353	10,3036	0 5137 1	TC	JOEWAKE	
0895	REF	1		10,3037	1 3336 0	TCF	FNCPET	
0896	ALL .1 RESTARTS BRANCH DIRECTLY TO INITDSP. NORMAL DISPLAYS ARE THE ONLY DISPLAYS ALLOWED TO USE .1 RESTARTS							
0898	INITDSP FIRST RESTORES THE EBANK AND THE SUPERBANK TO THE MOST RECENT NORMAL EBANK AND SUPERBANK.							
0899	IF THE MOST RECENT NORMAL DISPLAY REQUEST WAS NOT FINISHED, CONTROL IS SENT BACK TO THE LAST NORMAL USER.							
0900	OTHERWISE THE NORMAL DISPLAY SET UP IN THE NORMAL DISPLAY REGS IS STARTED UP IMMEDIATELY.							
0904	REF	4	LAST 1349	10,3040	3 1071 0	INITESP	CA	EBANKTEMP
0905	REF	80	LAST 1352	10,3041	54 003 0	TS	FRANK	RESTORE MOST RECENT NORMAL EBANK
0906	REF	4	LAST 1350	10,3042	3 0366 1	CA	RESTREQ	SUPERBANK AND JOB PRIORITY
0907	REF	1		10,3043	0 4727 1	TC	SUPERSE	RESTORE SUPERBANK
0908	REF	5	LAST 1351	10,3044	7 7730 0	MASK	PRIOR27	
0909	REF	13	LAST 1349	10,3045	0 5146 1	TC	PRIORCHG	
0910	REF	39	LAST 1351	10,3046	4 6250 1	CS	THREE	
0911	REF	3	LAST 232	10,3047	6 0374 1	AD	TEMPFLSH	
0912	REF	18	LAST 1352	10,3050	1 4640 0	TCF	BANKJUMP	
0913				10,3051	0 0003 1	PINBRNCH	RELINT	FOR CCPTN USERS
09135	REF	1		10,3052	3 1 72 0	CA	MARK2PAC	NFEED TO SAVE MPAC +2 FOR MARK USERS

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0914	REF	821	LAST	1351	10,3053	54 156 1	TS	MPAC +2	ONLY
0915	REF	21	LAST	1354	10,3054	3 0100 0	CA	FLAGWRD4	FINBRANCH CONDITION
0916	REF	1			10,3055	7 7743 1	MASK	PIAMASK	
0917	REF	438	LAST	1354	10,3056	10 000 0	CCS	A	
0918					10,3057	1 3762 1	TCF	+3	
0919	REF	1			10,3060	1 3472 1	TCF	FRASER	** NOTHING IN ENDIOLE
0920	REF	2	LAST	1354	10,3061	1 2400 0	TCF	MARKPLAY	
0921	REF	74	LAST	1325	10,3062	0 5574 0	NORMBRANCH TC	UPFLAG	SET PINBRANCH BIT
0922	REF	1			10,3063	00105 0	ACRES	PINBRFLG	
0923	REF	1			10,3064	3 4736 1	CAF	PRICCEIT	ERIC INTERRUPTED
0924	REF	21	LAST	1355	10,3065	7 0100 1	MASK	FLAGWRD4	
0925	REF	438	LAST	1355	10,3066	10 000 0	CCS	A	
0926	REF	1			10,3067	1 2545 0	TCF	KEEPERIC	
0927	REF	1			10,3070	1 2616 0	TCF	PLAYJUM1	
0928	REF	1			10,3071	0 2420 0	NVDSF	TC	CCPYPACS
09281	REF	5	LAST	1354	10,3072	3 0161 0	CA	TEMPER2	SET UP BLANK BITS FOR NVMONOPT IN CASE
09282	REF	22	LAST	1321	10,3073	7 4757 1	MASK	SEVEN	USER REQUESTS BLANKING MONITOR
09283	REF	241	LAST	1352	10,3074	54 001 1	TS	L	
0929	REF	47	LAST	1312	10,3075	4 4737 1	CS	BJT13	
0930	REF	12	LAST	1353	10,3076	50 164 1	INDEX	CCPINDEX	
0931	REF	1			10,3077	7 1067 0	MASK	DSFFLG	
0932	REF	13	LAST	1355	10,3079	50 164 1	INDEX	CCPINDEX	
0933	REF	2	LAST	1355	10,3081	55 067 0	TS	DSFFLG	
0934	REF	42	LAST	1321	10,3102	7 4744 0	MASK	BIT8	BIT8 SET IF REC MARK PERFORM DISPLAY
0935	REF	33	LAST	1257	10,3103	54 141 1	TS	TEM1	
0936	REF	822	LAST	1355	10,3104	3 0156 0	CA	MPAC +2	
0937	REF	2	LAST	1346	10,3105	54 165 1	TS	MPAC2SAV	
0938	REF	2	LAST	1354	10,3106	55 072 1	TS	MARK2PAC	* FOR DISK ONLY *
0939	REF	14	LAST	1355	10,3107	50 164 1	INDEX	CCPINDEX	
0940	REF	3	LAST	1353	10,3110	10 367 1	CCS	NVWORD	
0941	REF	1			10,3111	1 3120 0	TCF	NVDSF1	
0942	REF	1			10,3112	1 3234 0	TCF	CLEANEND	
0943	REF	4	LAST	1347	10,3113	4 0370 1	CS	MARKNV	
0944	REF	5	LAST	1355	10,3114	54 370 1	TS	MARKAV	IN CASE MARKPLAY AWAKENED AFTER SLEEPING
0945	REF	12	LAST	1316	10,3115	7 6077 0	MASK	LCW7	
0946	REF	1			10,3116	6 3516 0	AC	V05NGOM1	
0947	REF	34	LAST	1355	10,3117	6 0141 0	AD	TEM1	
0948	REF	138	LAST	1353	10,3120	6 4753 1	AC	DNF	
0949	REF	1			10,3121	0 4155 1	TC	NVMONOPT	
0950	REF	1			10,3122	1 2246 0	TCF	REST	IF BUSY

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0951	REF	6	LAST	471	10,3122	0 4433 1		TC	FLASHOFF	IN CASE OF EXTENDED VERB NON FLASH
0952	REF	1			10,3124	0 2416 0		TC	COPYTCGC	MPACS DESTROYED BY NVSLR
0953	REF	111	LAST	1327	10,3125	0 5516 0		TC	DOWNFLAG	UNSET SLEEPING BITS
0954	REF	1			10,3126	0 0102 1		ADRES	MARKVFLG	
09541	REF	102	LAST	1356	10,3127	1 5516 0		TC	DOWNFLAG	
09542	REF	1			10,3130	0 0103 0		ADRES	MARKVFLG	
09543	REF	103	LAST	1356	10,3131	1 5516 0		TC	DOWNFLAG	
09544	REF	1			10,3132	0 0104 1		ADRES	MARKVFLG	
0955	REF	6	LAST	1355	10,3133	3 3160 0	BLANKCHK	CA	TEMPER2	BLANK BITS 1,2,3 IF SET
0956	REF	2	LAST	441	10,3134	0 4255 1		TC	BLANKSUB	
0957	REF	1			10,3135	1 3071 0		TCF	NVCS	
0958	REF	46	LAST	1354	10,3136	2 4747 1	PERFCHK	CAF	BITS	BIT 5 FOR PERFORM
0959	REF	7	LAST	1356	10,3137	7 0160 1		MASK	TEMPER2	
0960	REF	440	LAST	1355	10,3140	10 000 0		CCS	A	IS THIS A GOPERF DISPLAY
0961	REF	1			10,3141	1 3164 0		TCF	ISTOR2ND	YES
0962	REF	55	LAST	1351	10,3142	3 4750 1	GOAMIDLE	CAF	BITS	
0963	REF	8	LAST	1356	10,3143	7 0160 1		MASK	TEMPER2	
0964	REF	441	LAST	1355	10,3144	10 000 0		CCS	A	
0965	REF	1			10,3145	1 3261 0		TCF	FLASHSUB	IT IS
0966	REF	9	LAST	1356	10,3146	4 0160 1		CS	TEMPER2	IS THIS A GDSPRET
0967	REF	60	LAST	1347	10,3147	7 4746 1		MASK	BITS	
0968	REF	442	LAST	1356	10,3150	11 000 0		CCS	A	
0969	REF	1			10,3151	1 3156 1		TCF	ISITN0	
09691	REF	15	LAST	1355	10,3152	50 164 1		INDEX	COPINDEX	
09692	REF	3	LAST	1353	10,3153	3 0372 1		CA	CACHELST	
09693	REF	823	LAST	1355	10,3154	54 157 0		TS	MPAC +3	
09694	REF	1			10,3155	1 3354 1		TCF	ENDIT	
0972	REF	16	LAST	1356	10,3156	50 164 1	ISITN0	INDEX	COPINDEX	IS THIS A PASTE
0973	REF	4	LAST	1355	10,3157	3 1367 0		CA	NVWORD	
0974	REF	13	LAST	1355	10,3160	7 6077 0		MASK	LOW7	CHECK MADE FOR PINBRNCH AND PRIO ON MARK
0975					10,3161	0 0006 1		EXTEND		
0976	REF	2	LAST	1356	10,3162	1 3261 0		BZF	FLASHSUB	YES, ASSUME PASTE ALWAYS ON FLASH
0977	REF	146	LAST	1346	10,3163	1 5155 1		TCF	ENDOFJOB	NOT FLASH, NOT GOPERF, THEREFORE EXIT
0978	REF	11	LAST	1356	10,3164	3 0160 0	ISTOR2ND	CA	TEMPER2	
0979	REF	48	LAST	1355	10,3165	7 4737 1		MASK	BITS	
0980	REF	443	LAST	1356	10,3166	10 000 0		CCS	A	
0981	REF	1			10,3167	1 3142 1		TCF	GOAMIDLE	SECOND
0982	REF	49	LAST	1356	10,3170	3 4737 0		CA	BITS	
0983	REF	17	LAST	1356	10,3171	50 164 1		INDEX	COPINDEX	
0984	REF	3	LAST	1355	10,3172	27 0067 0		ADS	DSPELG	
09845					10,3173	22 007 0		ZL		

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0985				10,3174	3 0006 1	EXTEND		IS IT MARK
0986	REF	1		10,3175	6 2441 1	BZMF	MARKREF	YES
0987	REF	35	LAST 1292	10,3176	7 4747 1	MASK	BIT12	
09871				10,3177	0 0006 1	EXTEND		
09872	REF	1		10,3200	1 3204 0	RZF	V50PASTE	
09874	REF	3	LAST 737	10,3201	4 1066 1	CS	AVWCRD1	AVWCRD1= -0 IS V97. AVWCRD1= -40 IS V99
098741	REF	1		10,3202	6 3542 1	AC	V97ND1	
09875	REF	2	LAST 1347	10,3203	1 3121 1	TCF	AV50DSP	
0988	REF	1		10,3204	3 3501 0	V50PASTE	CAF	V50ND0
0989	REF	3	LAST 1357	10,3205	1 3121 1	TCF	AV50DSP	DISPLAY SECOND PART OF GOPERF
0990	REF	47	LAST 1356	10,3206	4 4747 0	WITCHONE	CS	BITS
0991				10,3207	0 0006 1	EXTEND		TURN OFF KEY RELEASE LIGHT
0992	REF	35	LAST 1329	10,3210	0 0011 1	WAND	DSALMCUT	
0993	REF	22	LAST 1355	10,3211	3 0000 0	CA	FLAGWRD4	
0994	REF	1		10,3212	7 3517 0	MASK	NVPUSMSK	IS IT AVSUP ASLEEP
0995	REF	444	LAST 1356	10,3213	10 0000 0	CCS	A	
0996	REF	139	LAST 1355	10,3214	3 4753 1	CAF	CAF	
0997	REF	242	LAST 1355	10,3215	54 001 1	TS	L	
0998	REF	255	LAST 1354	10,3216	3 4755 1	CAF	ZERO	
0999	REF	243	LAST 1357	10,3217	50 001 0	INDEX	L	
1000	REF	11	LAST 460	10,3220	57 0041 0	XCH	CADRSTER	
1001				10,3221	0 0004 0	INFINT		
1002	REF	363	LAST 1352	10,3222	0 0002 0	TC	0	
1003	REF	6	LAST 45	10,3223	3 4217 1	XCHTOEND	CAF	ENDINST
1004	REF	29	LAST 1353	10,3224	56 064 0	XCHNYLOC	XCH	LOCCTR
1005				10,3225	0 0006 1	EXTEND		TC FMDCFJCH REPLACES GENADR IN LOC FOR WAS THIS ADDRESS SLEEPING
1006	REF	2	LAST 1353	10,3226	6 3232 1	BZMF	RELINTG	NO
1007	REF	30	LAST 1357	10,3227	56 064 0	XCH	LOCCTR	YES
1008	REF	31	LAST 1357	10,3230	50 064 0	INDEX	LOCCTR	
1009	REF	45	LAST 1318	10,3231	54 164 0	TS	LOC	
1010				10,3232	0 0003 1	RELINTG	RELINT	
1011	REF	364	LAST 1357	10,3233	0 0002 0	TC	0	BACK TO USER
1012	REF	4	LAST 882	10,3234	3 7723 0	CLEANEND	CAF	PRIO32
1014	REF	44	LAST 1298	10,3235	0 5125 0	TC	FINDVAC	ONE LOWER THAN DISPLAYS SLEEPING
1015	REF	2	LAST 212	0371		EBANK=	NVSAVE	
1016	REF	1		10,3236	04231 0	2CACR	JAMTERM	
1016	REF	1		10,3237	04060 0			
1017	REF	3	LAST 1356	10,3240	1 3262 0	TCF	FLASHSLB +1	
1018	REF	22	LAST 1357	10,3241	3 0100 0	ISITERIC	CA	FLAGWRD4
1019	REF	1		10,3242	7 3267 0	MASK	ITISMASK	IS FINERFLG, MARKICFLG SET
1020				10,3243	0 0006 1	EXTEND		

L DISPLAY INTERFACE POLYNIS

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1021	REF	2	LAST 1348	10,3244	1 2576 0		BZF	PRIORCORT	
1022	REF	147	LAST 1356	10,3245	1 5155 1		TCF	ENDOFJOB	
1023	REF	12	LAST 1357	10,3246	11 041 1	REST	CCS	CADRSTOR	IS SOMEONE IN ENDIDLE
1024	REF	148	LAST 1358	10,3247	1 5155 1		TCF	ENDOFJOB	YES
1025	REF	1		10,3250	1 3252 0		TCF	PESTSLEP	
1026	REF	149	LAST 1358	10,3251	1 5155 1		TCF	ENDOFJOB	
1027	REF	2	LAST 1346	10,3252	3 0162 1	PESTSLEP	CA	GENMASK	SET NVSLEEP BITS
1028	REF	1		10,3253	7 3520 1		MASK	ASTROCMK	
1029	REF	3	LAST 1354	10,3254	0 3545 0		TC	UPFN12	
1030				10,3255	241 0 0	CCT24100	ECT	24100	*** ECNT MOVE
1031	REF	18	LAST 1356	10,3256	50 164 1		INDEX	COPINDEX	
1032	REF	1		10,3257	3 3511 0		CAF	NVFAOP	
1033	REF	2	LAST 466	10,3260	0 4442 1		TC	NVSUEUSY	BUSY OR ABORT IF ILLEGAL
1034	REF	4	LAST 449	10,3261	0 4427 1	FLASHSLP	TC	FLASHCN	
1035	REF	19	LAST 1358	10,3262	3 0164 1		CA	COPINDEX	COPINDEX DESTROYED BY ENDIDLE
1036	REF	1		10,3263	54 157 0		TS	COPMFAC	
1037	REF	3	LAST 1358	10,3264	3 0162 1		CA	GENMASK	
1038	REF	1		10,3265	7 3711 0		MASK	IDLEMASK	
1039	REF	4	LAST 1358	10,3266	0 3545 0		TC	UPFN12	
1040				10,3267	40040 1	ITISMASK	OCT	40040	*** ENDIDLE ALLOW *** ECNT MOVE
1041	REF	2	LAST 223	10,3270	3 1073 1		CA	RISAVE	IS THIS A REPEAT AND RETURN DISPLAY
1042	REF	20	LAST 1358	10,3271	50 164 1		INDEX	COPINDEX	
1043	REF	36	LAST 1329	10,3272	7 4751 1		MASK	BIT3	
1044	REF	445	LAST 1357	10,3273	10 000 0		CCS	A	
1045	REF	1		10,3274	1 3361 1		TCF	UNSETIR1	YES
1046	REF	13	LAST 1358	10,3275	11 041 1		CCS	CADRSTOR	SEE IF SOMEONE ALREADY IN ENDIDLE
1047	REF	1		10,3276	1 2241 1		TCF	ISITPRIC	
1048				10,3277	1 3301 1		TCF	+2	
1049	REF	2	LAST 1358	10,3300	1 2241 1		TCF	ISITPRIC	
1050	REF	1		10,3311	0 4207 0		TC	ENDIDLE	
1051	REF	1		10,3312	1 3373 1	ICLERET1	TCF	TERMATE	
1052	REF	1		10,3303	1 3412 1		TCF	PROCEED	ENDIDLE RETURNS HERE ON PROCFEC
1053	REF	1		10,3304	4 3527 0		CS	LOWLOAD	
1054	REF	824	LAST 1356	10,3305	6 0154 1		AD	MFAC	VERBPEC
1055				10,3306	0 0006 1		EXTEND		
1056	REF	446	LAST 1358	10,3317	26 000 0		CIM	A	
1057				10,3310	0 0006 1		EXTEND		
1058	REF	1		10,3311	1 3462 0		BZF	LOADITIS	V21 OR V22 OR V23 ON CISKY

L DISPLAY INTERFACE ROUTINES

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1059	REF	88	LAST 1350	10,3312	3 4752 0	CKTOENT	CAF	TWC	
1060	REF	1		10,3313	54 161 0	ENDOUT	TS	OUTHERE	
1061	REF	24	LAST 1357	10,3314	3 0100 0		CA	FLAGWRD4	CHECK NATURE OF ENDTIDE RETURN
1062	REF	2	LAST 1290	10,3315	7 4101 1		MASK	ACT600 0	
1063	REF	447	LAST 1358	10,3316	10 000 0		CCS	A	
1064	REF	1		10,3317	1 3322 0		TCF	TIMECHK	PRIC ENDTIDE RETURN
1065	REF	1		10,3320	1 3420 1		TCF	NORMRET	NORMAL ENDTIDE RETURN
1066	REF	1		10,3321	1 3414 1		TCF	MARKRET	MARK ENDTIDE RETURN
1067	REF	21	LAST 1349	10,3322	4 0025 1	TIMECHK	CS	TINF1	
1068	REF	2	LAST 1349	10,3323	6 1164 0		AD	FRINTIME	
1069	REF	448	LAST 1350	10,3324	10 000 0		CCS	A	
1070				10,3325	4 0000 0		CCW		
1071	REF	3	LAST 1295	10,3326	6 7734 0		AD	OUT37776	
1072	REF	140	LAST 1357	10,3327	6 4753 1		AD	CNE	
1073	REF	1		10,3330	6 3571 1		AD	-2SEC	
1074				10,3331	0 0006 1		EXTEND		
1075	REF	2	LAST 1355	10,3332	6 2545 1		BZMF	KEEPPRIC	
1076	REF	2	LAST 1359	10,3333	1 3430 1		TCF	NORMRET	
1084	REF	141	LAST 1350	10,3334	3 4753 1	NORMWAKE	CAF	CNE	
1085	REF	1		10,3335	1 3025 1		TCF	WAKEPLAY	
1086	REF	2	LAST 1359	10,3336	10 161 0	ENCRET	CCS	OUTHERE	
1087	REF	142	LAST 1359	10,3337	6 4753 1		AD	ONE	
1088				10,3340	1 3342 0		TCF	+2	NORMAL ENDTIDE EXIT
1089	REF	150	LAST 1358	10,3341	1 5155 1		TCF	ENDOFFJOB	
1090	REF	2	LAST 1358	10,3342	50 157 1		INDEX	CCFMPAC	
1091	REF	4	LAST 1356	10,3343	6 0372 1		AD	CADRFLSH	
1092	REF	825	LAST 1358	10,3344	54 157 0		TS	MFAC +3	
1093	REF	4	LAST 1358	10,3345	3 0162 1		CA	GENMASK	REMOVE ENDTIDE AND PINEFRANCH BITS
1094	REF	1		10,3346	7 3350 0		MASK	PINIDMSK	
1095	REF	3	LAST 1354	10,3347	0 3555 1		TC	DOWNENT2	
1096				10,3350	74044 1	PINIDMSK	CCT	74044	*** DON'T MOVE
1097	REF	40	LAST 1354	10,3351	4 6250 1		CS	THREE	
1098	REF	2	LAST 263	10,3352	0 4154 0		TC	MSLSE	BLANK EVERYTHING EXCEPT MM
1099				10,3353	1 3354 1		TCF	+1	
1100	REF	3	LAST 1350	10,3354	3 0163 0	ENDIT	CA	USERPRIC	RETURN TO USERS PRIORITY
1101	REF	6	LAST 1354	10,3355	7 7730 0		MASK	PRIC37	
1102	REF	19	LAST 1354	10,3356	0 5146 1		TC	PRIORCHG	
1103	REF	826	LAST 1359	10,3357	3 0157 1		CA	MPAC +3	
1104	REF	19	LAST 1354	10,3360	1 4640 0		TCF	BANKJUMF	
1105	REF	21	LAST 1358	10,3361	50 164 1	UNSETR1	INDEX	CCFINDEX	RESET REPEAT AND RETURN REQUEST
1106	REF	27	LAST 1358	10,3362	4 4751 1		CS	BITS	

L DISPLAY INTERFACE ROUTINES

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1107	REF	3	LAST 1358	10,3363	7 1073 0		MASK	RISAVE	
1108	REF	4	LAST 1360	10,3364	55 1073 0		TS	RISAVE	
1109	REF	256	LAST 1357	10,3365	3 4755 1		CAF	ZERO	*** 205 ONLY MARKBRAN USERS IN
1110	REF	2	LAST 1354	10,3366	0 4727 1		TC	SUPERSW	SUPERBANK 0
1111	REF	41	LAST 1359	10,3367	3 6250 0	-1	CAF	THREE	RETURN TO USERS IMMEDIATE RETURN LCC
1112	REF	22	LAST 1359	10,3370	50 164 1	IMMCRET	INDEX	CCPINDEX	
1113	REF	5	LAST 1359	10,3371	6 0372 1		AD	CACPFLSH	
1114	REF	20	LAST 1359	10,3372	1 4640 0		TCF	BANKJUMP	
1115	REF	257	LAST 1360	10,3373	3 4755 1	TERMATE	CAF	ZERO	ASTRONAUT TERMINATE (V34) RETURNS TO
1116	REF	1		10,3374	1 3313 1		TCF	ENDOLT	
1117	REF	11	LAST 1352	10,3375	4 0160 1	LINUSCH	CS	PLAYTSM4	IS THIS A LINLS
1118	REF	78	LAST 1348	10,3376	7 4736 0		MASK	R1T14	
1119	REF	449	LAST 1359	10,3377	10 0000 0		CCS	A	
1120	REF	6	LAST 1284	10,3400	1 6742 1		TCF	C+1	NO
1121	REF	3	LAST 1353	10,3401	4 0157 0		CS	PLAYTSM3	YES, IS IT ALREADY IN ENDIDLE
1122	REF	23	LAST 1360	10,3402	50 164 1		INDEX	CCPINDEX	
1123	REF	6	LAST 1360	10,3403	6 0372 1		AD	CACPFLSH	
1124				10,3404	0 0006 1		EXTEND		
1125				10,3405	1 3407 0		BZF	+2	YES
1126	REF	365	LAST 1357	10,3406	0 0002 0		TC	G	NO
1127	REF	12	LAST 472	10,3407	11 0011 1		CCS	DSPLOCK	IS THE ASTRONAUT BUSY
1128	REF	151	LAST 1359	10,3410	2 5155 0		TC	ENDCFJCB	END THE NEW DISPLAY, ITS ALREADY ACTIVE
1129	REF	366	LAST 1360	10,3411	0 0002 0		TC	Q	
P1130	MORE LOGIC COULD BE INCORPORATED HERE TO MAKE SURE A RECYCLE IS A RECYCLE AND CONVERSELY THAT A LOAD IS A LOAD.								
1132	REF	142	LAST 1359	10,3412	3 4753 1	PROCCD	CAF	ONE	ASTRONAUT PROCEED (V33) RETURNS
1133	REF	2	LAST 1360	10,3413	1 3313 1		TCF	ENDOLT	
P1138	LASTPLAY CHECKS TO SEE IF (1) THE LAST NORMAL DISPLAY WAS EITHER INTERRUPTED BY A RRIC OR A MARK (MARK								
P1140	COULD ONLY HAPPEN DURING PINBRANCH) OR IF (2) THE LAST NORMAL DISPLAY WAS REQUESTED WHILE A HIGHER PRIORITY								
P1142	DISPLAY WAS GOING RESULTING IN THE NORMAL BEING PUT TO SLEEP.								
P1143	IF EITHER OF THE ABOVE 2 CONDITIONS EXISTS, THE NORMAL DISPLAY IS AWAKENED TO GO TO PLAYJUM1 WHICH STARTS								
P1145	UP THE MOST RECENT VALID NORMAL DISPLAY. IF THESE 2 CONDITIONS DO NOT EXIST, CONTROL GOES TO PLAYJUM1 WHICH IS								
P1147	STARTED IMMEDIATELY WITH THE ASSUMPTION THAT THE MOST RECENT NORMAL DISPLAY IS ALREADY IN-ENDIDLE (DURING A								
P1149	PINBRANCH) OR THAT A RESTART HAS OCCURRED AND THE DISPLAY CAN BE STARTED AS A .1 RESTART.								
1163	REF	24	LAST 1302	10,3414	4 6245 0	MARKRET	CS	SIX	
1164	REF	25	LAST 1359	10,3415	7 0100 1		MASK	FLAGWRD4	
1165				10,3416	0 0004 0		INHINT		*** MAY MOVE DISPLAY FLAGWORD OUT OF
1166	REF	26	LAST 1360	10,3417	54 100 1		TS	FLAGWRD4	
1167				10,3420	0 0003 1		RELINT		INHINT BEALM
1168	REF	2	LAST 1354	10,3421	1 3236 0		TCF	ENDPRT	

L DISPLAY INTERFACE ROUTINES

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1169	REF	2	LAST 1313	10,3422	3 7752 0	MARKOVER	CAF	MINUS1	RURTREG2 IS - MEANS ENCCFJOB TO ENDRET
1170	REF	3	LAST 1359	10,3423	54 161 0		TS	OUTHERE	
1171	REF	27	LAST 1360	10,3424	3 0100 0		CA	FLAGWRD4	IS ENCCFLG SET
1172	REF	12	LAST 1284	10,3425	7 4355 1		MASK	PRIC3)	IS NORMAL CR PRIO IN ENCCLE
1173	REF	450	LAST 1360	10,3426	10 000 0		CCS	A	
1174	REF	1		10,3427	1 3362 1		TCF	ACFMENCH	
1175	REF	28	LAST 1361	10,3430	3 0100 0	NORMRET	CA	FLAGWRD4	IS MARK SLEEPING
1176	REF	2	LAST 1354	10,3431	7 3525 1		MASK	BITS5+11	OR WAITING
1177	REF	451	LAST 1361	10,3432	10 000 0		CCS	A	
1178	REF	1		10,3433	1 3024 0		TCF	MARKWAKE	
1179	REF	29	LAST 1361	10,3434	3 0100 0		CA	FLAGWRD4	NO
1180	REF	1		10,3435	7 3526 1		MASK	BITS5+10	IS NORMAL INTERRUPTED CR WAITING
1181	REF	452	LAST 1361	10,3436	10 000 0		CCS	A	
1182	REF	1		10,3437	1 3334 1		TCF	NORMWAKE	YES
1183	REF	5	LAST 1354	10,3440	3 1071 0		CA	EBANKTEM	NO, WAS IT A FLASH REQUEST
1184	REF	4	LAST 1321	10,3441	7 4771 0		MASK	OCT50	CR A GDCSPRET
1185	REF	453	LAST 1361	10,3442	10 000 0		CCS	A	
1186	REF	3	LAST 1360	10,3443	1 3336 0		TCF	ENDRET	YES
1187	REF	3	LAST 1357	10,3444	3 0371 1		CA	NVSASF	
1188				10,3445	0 0006 1		EXTEND		
1189	REF	4	LAST 1361	10,3446	1 3336 0		BZF	ENDRET	
1190	REF	5	LAST 470	10,3447	3 5025 0		CAF	PRIC15	
1191				10,3450	0 0004 0		INHINT		
1192	REF	30	LAST 1351	10,3451	0 5072 1		TC	NOVAC	
1193	REF	5	LAST 1356	10,3452	0261 1		EBANK=	NVWPRC	
1194	REF	2	LAST 1355	10,3452	0261 1		2CADR	PLAYJLM1	
1194				10,3453	20060 0				
1195	REF	5	LAST 1361	10,3454	1 3336 0		TCF	ENDRET	
1196	REF	37	LAST 1361	10,3455	3 0100 0	MARSLEEP	CA	FLAGWRD4	IS MARK ALREADY IN
1197	REF	3	LAST 1361	10,3456	7 3525 1		MASK	BITS5+11	
1198	REF	454	LAST 1361	10,3457	10 000 0		CCS	A	
1199	REF	152	LAST 1360	10,3460	1 5155 1		TCF	ENDOFFJOB	YES
11991	REF	3	LAST 1350	10,3461	1 2755 0		TCF	GCSLEEPS	
1200	REF	3	LAST 1359	10,3462	50 157 1	LOADITIS	INDEX	CCPMAC	
1201	REF	6	LAST 1361	10,3463	3 0367 0		CA	NVWCRC	
1202	REF	14	LAST 1356	10,3464	7 6077 0		MASK	LCW7	
1203				10,3465	4 0000 0		COM		
1204	REF	827	LAST 1355	10,3466	6 0155 0		AC	MFAC +1	NCUNREG
1205				10,3467	0 0006 1		EXTEND		
1206	REF	1		10,3470	1 3312 0		BZF	OKTOENT	NO, THEN LOAD IS VALID
1207	REF	6	LAST 829	10,3471	1 3051 1		TCF	PIABNCH	YES, ACCEPT LCAC BUT ASK FOR LAST AGAIN

L DISPLAY INTERFACE ROUTINES

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1208	REF	42	LAST 1360	10,3472	4 6250 1	EFASER	CS	T-PEE	BLANK EVERYTHING EXCEPT MM
1209	REF	3	LAST 1360	10,3472	0 4154 0		TC	NVCUB	
1210	REF	153	LAST 1361	10,3474	1 5155 1		TCF	ENDOFJOB	
1211	REF	154	LAST 1362	10,3475	1 5155 1		TCF	ENDOFJOB	
1212				10,3476	00036 1	PERFORMASK	CCT	0036	FLASH, PERFORM, ELANK R2 AND R3
1213				10,3477	00231 1	V01N25	VN	00125	
1214				10,3500	01407 0	V06N07	VN	00607	GOPERF3 VN DISPLAY BEFORE VEC
1215				10,3501	14400 0	V50N00	VN	5000	
1216				10,3502	00030 1	PERF2MSK	OCT	00030	FLASH, PERFORM
1217				10,3503	01006 0	V04N06	VN	00406	
1218				10,3504	00014 1	PERF4MSK	OCT	14	FLASH, ELANK R3
1219	REF	7	LAST 1361	10,3505	10,3505	GCAG1N	EQUALS	PINBRNCH	
1220				10,3505	20010 1	REDOMASK	CCT	20010	BITS 4 AND 14
1221				10,3506	40230 1	MARK3MSK	OCT	40230	MARK, DECIMAL NCUN, PERFORM, FLASH
1222				10,3507	40036 0	MARK4MSK	CCT	40036	MARK, PERFORM, FLASH, ELANK 2 AND 3
1223	REF	1		10,3510	20543 1	NVCADR	CADR	REDCPPIC	
1224	REF	4	LAST 1365	10,3511	20400 1	WAKECADR	CADR	MARKPLAY	
1225	REF	3	LAST 1261	10,3512	20616 1		CADR	PLAYJUM	
1226				10,3513	03400 0	OCT3400	OCT	3400	ELANK MASK
1227				10,3514	11210 1	NBUSMASK	CCT	11210	
1228				10,3515	66521 1	PMASK	CCT	66521	
1229	REF	4	LAST 448		4144	VERPMASK	=	MIL7	(OCT 37600)
1230				10,3516	01177 1	V05N00M1	CCT	1177	V05 MINUS CNF
1231	REF	1		10,2330		GCXDSP	EQUALS	GCMARK	
1232	REF	1		10,2350		GCXDSPR	EQUALS	GCMARKR	
1233	REF	12	LAST 703	10,2334		GCXDSPF	EQUALS	GCMARKF	
1234	REF	6	LAST 491	10,2353		GCXDSPFR	EQUALS	GCMARKFR	
1235	REF	2	LAST 252		5472	ENCFXT	EQUALS	ENCMARK	
1236	REF	14	LAST 1102		0165	MPAC2SAV	EQUALS	BANKSET	
1238				10,3517	00700 0	NVEUSMSK	OCT	700	
12385				10,3520	00704 1	ASTRCMSK	CCT	704	
1239				10,3521	40030 0	MPERFMSK	OCT	40030	BIT 15,5,4 FOR MARK, PERFORM, FLASH
1240				10,3522	34300 0	OCT34300	OCT	34300	
1241				10,3523	40100 1	BITS15+7	CCT	40100	
1242				10,3524	00110 1	BITS7+4	OCT	110	
1243	REF	3	LAST 1353		1067	CSPFLG	EQUALS	EBANKSAV	
1244	REF	1			1070	MARKFLAG	EQUALS	MARKFRAN	
1245	REF	6	LAST 1361		1071	SAVEFLAG	EQUALS	EBANKTFM	
1246				10,3525	02020 1	BITS5+11	CCT	2020	* CCNT MCVE
1247				10,3526	01010 1	BITS4+10	CCT	1010	* CCNT MCVE
1249				10,3527	00026 0	LOWLOAC	CEC	22	
1250				10,3530	77730 0	BLSYMSK	CCT	77730	
1252				10,3531	00050 1	CADRMASK	OCT	50	
1253	REF	4	LAST 1304		7743	PINMASK	EQUALS	13,14,15	
1254	REF	2	LAST 1356		10,3071	GCPLAY	EQUALS	NVDSP	
1255						PRIOSAVE	EQUALS	R1SAVE	
1256	REF	828	LAST 1361		0157	CCPMAC	EQUALS	MPAC +3	
1257	REF	829	LAST 1362		0160	TEMPOR2	EQUALS	MPAC +4	

L DISPLAY INTERFACE ROUTINES

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1258	REF 830	LAST 1362	0161		CUTHERE	EQUALS	MPAC +5	
1259	REF 46	LAST 1357	0164		COPINDEX	EQUALS	LCC	
1260	REF 37	LAST 1069	0163		USERPRIC	EQUALS	MODE	
1261	REF 831	LAST 1262	0162		GENMASK	EQUALS	MPAC +6	
1262			10,3532	20144 1	PRIOOCT	OCT	20144	PRI0
1263			10,3533	42424 0	MARKOCT	OCT	42424	MARK
1264			10,3534	11254 1	OCT	OCT	11254	ACFM
1265			10,3535	74704 1	10LESLEP	OCT	74704	
1266			10,3536	67777 1	CCT67777	OCT	67777	
1267	REF 9	LAST 491	5464		LINLS	EQUALS	BLANKET	
1268	REF 832	LAST 1363	0154		FACEREC	EQUALS	MPAC	
1269	REF 833	LAST 1363	0155		PLAYTEM1	EQUALS	MPAC +1	
1270	REF 834	LAST 1362	0157		PLAYTEM3	EQUALS	MPAC +3	
1271	REF 835	LAST 1362	0160		PLAYTEM4	EQUALS	MPAC +4	
1273			10,3537	40420 0	OCT40420	OCT	40420	
1274	REF 3	LAST 1351	10,3540	02547 0	MAKEGEN	(FNACR	MAKEPLAY	
1275			10,3541	10200 1	OCT10200	OCT	10200	
1276			10,3542	30200 0	V57NOC	VN	05700	PASTE FOR V97 CR V99
12761			10,3543	20100 1	OCT20100	OCT	20100	
12762			10,3544	24030 1	CLOCKCEN	OCT	24030	FLASH, PERFORM, V99 CR V97 PASTE, REFLASH

L SERVICE ROUTINES

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0001				10,3545			BANK 10
0002	REF	2	LAST 1344	10,2000			SETLCC DISPLAYS
0003				10,3545			BANK
0004	REF	2	LAST 1344 TO 1364:	655	655*		CCUNT* \$\$/DSPLA
0005				10,3545	0 0004 0	UPENT2	INFINT
0006	REF	3	LAST 1276	10,3546	7 5650 0		MASK OCT77770
0007	REF	244	LAST 1357	10,3547	54 001 1		TS L
0008	REF	31	LAST 1361	10,3550	4 0100 1		CS FLAGWRD4
0009	REF	245	LAST 1364	10,3551	7 0001 1		MASK L
0010	REF	32	LAST 1364	10,3552	26 100 1		ADS FLAGWRD4
0011				10,3553	0 0003 1	JCIN	RELINT
0012	REF	7	LAST 1360	10,3554	1 6742 1		TCF G+1
0013				10,3555	0 0004 0	DOWNENT2	INFINT
0014	REF	4	LAST 1364	10,3556	7 5650 0		MASK OCT7777J
0015				10,3557	4 2000 0		COM
0016	REF	33	LAST 1364	10,3560	7 0100 1		MASK FLAGWRD4
0017	REF	34	LAST 1364	10,3561	54 100 1		TS FLAGWRD4
0018	REF	1		10,3562	1 2553 0		TCF JCIN
0032	REF	23	LAST 1355	4757		OCT7	EQUALS SEVEN

L SERVICE ROUTINES

LSEF'S PAGE NO. 2 EO S3

P0033

R0034 UPFLAG AND DOWNFLAG ARE ENTIRELY GENERAL FLAG SETTING AND CLEARING SUBROUTINES. USING THEM, WHETHER OR
 R0036 NOT IN INTERRUPT, ONE MAY SET OR CLEAR ANY SINGLE, NAMED BIT IN ANY ERASABLE REGISTER, SUBJECT OF COURSE TO
 R0038 ERANK SETTING. A "NAMED" BIT, AS THE WORD IS USED HERE, IS ANY BIT WITH A NAME FORMALLY ASSIGNED BY THE YLL
 R0040 ASSEMBLER.

R0041 AT PRESENT THE ONLY NAMED BITS ARE THOSE IN THE FLAGWORDS. ASSEMBLER CHANGES WILL MAKE IT POSSIBLE TO
 R0043 NAME ANY BIT IN ERASABLE MEMORY.

R0044 CALLING SEQUENCES ARE AS FOLLOWS:-

R0045	TL	UPFLAG	TC	DOWNFLAG
R0046	ADRS	NAME OF FLAG	ADRS	NAME OF FLAG

R0047 RETURN IS TO THE LOCATION FOLLOWING THE "ADRS" ABOUT .58 MS AFTER THE "TC".

R0049 UPON RETURN A CONTAINS THE CURRENT FLAGWORD SETTING.

0051	REF	2	LAST 1284	5514		BLCK	02
0052				4000		SETLCC	FFTAG1
0053	REF	1		5504		BANK	
						COUNT#	#1/FLAG

0054	REF	367	LAST 1360	5514	3 0002 0	UPFLAG	CA	Q	
0055	REF	2	LAST 735	5515	0 5522 1		TC	DEBIT	
0056				5516	4 0000 0		COM		+(15 - BIT)
0057				5507	0 0006 1		EXTEND		
0058	REF	16	LAST 1018	5510	04 001 1		PDR	LCHAN	SET BIT
0059	REF	57	LAST 1315	5511	51 001 0	DOWNFLAG	INDEX	ITEMP1	
0060	REF	29	LAST 956	5512	54 074 0		TS	FLAGWORD	
0061	REF	26	LAST 1290	5513	22 163 1		LXCH	ITEMP3	
0062				5514	0 0013 1		SELFINT		
0063	REF	246	LAST 1364	5515	0 0001 0		TC	L	

0064	REF	368	LAST 1365	5516	3 0002 0	DOWNFLAG	CA	Q	
0065	REF	2	LAST 1365	5517	0 5522 1		TC	DEBIT	
0066	REF	247	LAST 1365	5520	7 0011 1		MASK	L	RESET BIT
0067	REF	2	LAST 735	5521	1 5511 0		TCF	DOWNFLAG	

0068	REF	144	LAST 1360	5522	6 4753 1	DEBIT	AD	CNF	CFT DE BITS
0069				5523	0 0014 0		INHINT		
0070	REF	27	LAST 1365	5524	54 163 0		TS	ITEMP3	
0071	REF	3	LAST 1084	5525	3 4762 0		CA	LCW4	DEC15
0072	REF	59	LAST 1365	5526	54 161 1		TS	ITEMP1	
0073	REF	28	LAST 1365	5527	50 163 1		INDEX	ITEMP3	
0074				5530	2 7777 0		CA	0 -1	ADRS
0075	REF	248	LAST 1365	5531	54 001 1		TS	L	
0076	REF	258	LAST 1360	5532	3 4755 1		CA	ZERO	

L SERVICE ROUTINES

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0077 5533 0 0006 1
 0078 REF 59 LAST 1365 5534 10 061 1
 0079 REF 60 LAST 1366 5535 52 062 1
 0080 REF 61 LAST 1366 5536 50 061 0
 0081 REF 30 LAST 1365 5537 3 0074 1
 0082 REF 249 LAST 1365 5540 54 001 1
 0083 REF 26 LAST 1314 5541 50 062 0
 0084 REF 47 LAST 1345 5542 4 4735 0
 0085 REF 265 LAST 1365 5543 0 0002 0

EXTEND
 RV ITEMP1
 EXCH ITEMP1
 INDEX ITEMP1
 CA FLAGWORD
 TS L
 INDEX ITEMP2
 CS BIT15
 TC Q

A = FLAGWORD, L = (15 - EIT)

CURRENT STATE

-(15 - BIT)

L SERVICE ROUTINES

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POC86 DELAYJOB- A GENERAL ROUTINE TO DELAY A JOB A SPECIFIC AMOUNT OF TIME BEFORE PICKING UP AGAIN.

POC88 ENTRANCE REQUIREMENTS...

POC89				CAF	DT	DELAY JOB FOR DT CENTISECS
AD090				TC	BANKCALL	
AD091				CADR	DELAYJOB	

0092				BANK	06
0093	REF	1		SETLCC	DELAYJOB
0094				BANK	

POC95 THIS MUST REMAIN IN BANK 0 *****

0096	REF	1		COUNT#	\$\$/DELAY	
00965	REF	7	LAST 1306	00,3735	3 5000 1	2SECCELY CAF 2SECS
0097				00,3736	0 0004 0	DELAYJOB INHINT
0098	REF	370	LAST 1366	00,3737	54 002 1	TS 0 STORE DELAY DT IN 6 FOR DLY -1 IN
0099	REF	1		00,3740	3 4752 0	CAF DELAYNUM WAITLIST
0100	REF	58	LAST 1316	00,3741	54 070 1	DELLCCP TS RLPTREG1
0101	REF	455	LAST 1361	00,3742	50 000 1	INDEX A
0102	REF	4	LAST 222	00,3743	3 1223 1	CA DELAYLCC IS THIS DELAYLCC AVAILABLE
0103				00,3744	0 0006 1	EXTEND
0104	REF	1		00,3745	1 3753 1	BZF OK2DELAY YES
0105	REF	59	LAST 1367	00,3746	10 070 1	CCS RLPTREG1 NC, TRY NEXT DELAYLOC
0106	REF	1		00,3747	1 3741 1	TCF DELLCOR
0107	REF	27	LAST 1321	00,3750	52 134 0	EXCH PUF2
0108	REF	7	LAST 1320	00,3751	0 5716 0	TC BAILCLTI NC AVAILABLE LCCS.
0109				00,3752	31104 0	OCT 21174
0110	REF	1		00,3753	3 2773 1	OK2DELAY CA TCSLEEP SET WAITLIST IMMEDIATE RETURN
0111	REF	7	LAST 1124	00,3754	54 061 1	TS WAITEXIT
0112	REF	31	LAST 1097	00,3755	3 0204 0	CA FRANK
0113	REF	60	LAST 1367	00,3756	6 0070 0	AD RLPTREG1 STORE FRANK FOR TASK CALL
0114	REF	250	LAST 1366	00,3757	54 001 1	TS L
0115	REF	1		00,3760	3 2774 0	CAF WAKECAD STORE CADR FOR TASK CALL
0116	REF	2	LAST 1111	00,3761	1 5211 1	TCF DLY2 -1 DLY IS IN WAITLIST ROUTINE
0117	REF	15	LAST 1352	00,3762	0 4645 1	TCGETCAD TC WAKECADR GET CALLERS FCADR
0118	REF	61	LAST 1267	00,3763	50 070 0	INDEX RLPTREG1
0119	REF	5	LAST 1367	00,3764	55 1223 0	TS DELAYLOC SAVE DELAY CADRS
0120	REF	8	LAST 1253	00,3765	0 5133 0	TC JCBSLEFR
0121	REF	259	LAST 1365	00,3766	3 4755 1	WAKEP CAF ZERC
0122	REF	45	LAST 1351	00,3767	50 006 1	INDEX BRANK

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0123	REF	6	LAST 1367	00,3770	57'223 1	XCH	DELAYLCC	MAKE DELAYLCC AVAILABLE
0124	REF	13	LAST 1354	00,3771	0 5137 1	TC	JOBWAKE	
0125	REF	81	LAST 1318	00,3772	0 5261 1	TC	TASKOVER	
0126	REF	1		01,3773	03760 0	TCSLEEP	GENADR TCGETCAD -2	
0127	REF	1		00,3774	03766 0	WAKECAD	GENADR WAKER	

L SERVICE ROUTINES

USER'S PAGE NO. 6 EO S3

R0128 GENTRAN, A BLOCK TRANSFER ROUTINE.

R0129 WRITTEN BY E. EYLES

R0130 MOD 1 BY KERNAN

UTILITY REV 17 11/18/67

R0132 MOD 2 BY SCHULENBRE (REMOVE RELINT) SKIPPER REV 4 2/28/68

R0133 THIS ROUTINE IS USEFUL FOR TRANSFERRING N CONSECUTIVE ERASABLE OR FIXED QUANTITIES TO SOME OTHER N
 R0135 CONSECUTIVE ERASABLE LOCATIONS. IF BOTH BLOCKS OF DATA ARE IN SWITCHABLE EBANKS, THEY MUST BE IN THE SAME ONE.

R0137 GENTRAN IS CALLABLE IN A JOB AS WELL AS A RUT. THE CALLING SEQUENCE IS:

A0139		I	CA	N-1	# OF QUANTITIES MINUS CNF.
A0140		I +1	TC	GENTRAN	IN FIXED-FIXED.
A0141		I +2	ACRS	L	STARTING ADRES OF DATA TO BE MOVED.
A0142		I +3	ACRS	M	STARTING ADRES OF DUPLICATION BLOCK.
A0143		I +4			RETURNS FREE.

R0144 GENTRAN TAKES 25 MCT'S (300 MICROSECONDS) PER ITEM + 5 MCT'S (60 MICS) FOR ENTERING AND EXITING.

R0146 A, L AND ITEMPL ARE NOT RESERVED.

0147				5544	BLOCK 02
0148	REF	2	LAST 1344	4000	SETLCP FFTAG4
0149				5544	BANK
0150	REF	42	LAST 1366	0061	EBANK= ITEMPL
0151	REF	1			CCLNT# 54/TRAN

0152				5544	0 0004 0	GENTRAN	INHINT	
0153	REF	63	LAST 1369	5545	54 061 1		TS	ITEMPL
0154	REF	371	LAST 1367	5546	50 002 0		INDEX	Q
0155				5547	6 0000 1		AD	0
0156	REF	456	LAST 1367	5548	50 000 1		INDEX	A
0157				5551	3 0000 1		CA	0
0158	REF	251	LAST 1367	5552	54 001 1		TS	L
0159	REF	64	LAST 1369	5553	3 0061 0		CA	ITEMPL
0160	REF	372	LAST 1369	5554	50 002 0		INDEX	Q
0161				5555	6 0011 0		AC	1
0162	REF	457	LAST 1369	5556	50 000 1		INDEX	A
0163				5557	22 000 1		LXCH	0
0164	REF	65	LAST 1369	5560	10 061 1		CCS	ITEMPL
0165	REF	2	LAST 298	5561	1 5545 1		TCF	GENTRAN +1
0166	REF	5	LAST 1284	5562	1 6744 1		TCF	Q+2

SAVE N-1.
 C(Q) = ACRS L.
 ACRS (L + N - 1).
 C(ABOVE).
 SAVE DATA.
 ACRS (M + N - 1).
 STUFF IT.
 LCCP UNTIL N-1 = C.
 RETURN TO CALLER.

L SERVICE ROUTINES

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P0167 B5CFF ZERO BIT 5 OF EXTVBACT, WHICH IS SET BY TESTXACT.

P0168 MAY BE USED AS NEEDED BY ANY EXTENDED VERB WHICH HAS DONE TESTXACT

0170 REF 1 COUNT* \$1/EXTVB

0171	REF	48	LAST 1357	5563	4 4747 0	B5CFF	CS	RJT5
0172	REF	18	LAST 1344	5564	7 1043 0		MASK	EXTVBACT
0173	REF	19	LAST 1370	5565	551043 0		TS	EXTVBACT
0174	REF	155	LAST 1362	5566	0 5155 0		TC	ENDCFJCB

L ALARM AND ABORT

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0001 THE FOLLOWING SUBROUTINE MAY BE CALLED TO DISPLAY A NON-ABORTIVE ALARM CONDITION. IT MAY BE CALLED
 0003 EITHER IN INTERRUPT OR UNDER EXECUTIVE CONTROL.

0004 CALLING SEQUENCE IS AS FOLLOWS:

0005 TC ALARM
 0006 OCT AAAA ALARM NO. NN IN GENERAL AREA AAA.
 0007 (RETURNS HERE)

0008 5567 BLOCK 02
 0009 REF 1 4000 SETLOC FFTAG7
 0010 5567 BANK

0011 REF 7 LAST 473 0375 FBANK= FAILREG

0012 REF 1 COUNT* \$1/ALARM
 0013 ALARM TURNS ON THE PROGRAM ALARM LIGHT, BUT DOES NOT DISPLAY.

0014 5567 0 0004 0 ALARM INHINT

0015 REF 373 LAST 1369 5570 3 0002 0 CA Q
 0016 REF 4 LAST 1276 5571 55'363 1 ALARM2 TS ALMCAER
 0017 REF 374 LAST 1371 5572 50 002 0 INDEX Q
 0018 5573 3 0000 1 CA 0
 0019 REF 252 LAST 1369 5574 54 001 1 BCRTEXT TS L

0020 REF 46 LAST 1367 5575 3 0006 1 PRIQENT CA BEANK
 0021 5576 0 0006 1 +1 EXTEND
 0022 REF 27 LAST 1351 5577 04 007 1 ROR SLPERBNK
 0023 REF 5 LAST 1371 5600 55'364 0 TS ALMCAER +1

ADD SUPER BITS.

0024 REF 375 LAST 1371 5601 3 0002 0 LARMENT CA Q
 0025 REF 66 LAST 1369 5602 54 061 1 TS IFMP1

STORE RETURN FOR ALARM

0026 REF 8 LAST 1371 5603 10 375 1 CHKFAIL1 CCS FAILREG
 0027 REF 1 5604 1 5610 1 TCF CHKFAIL2
 0028 REF 253 LAST 1371 5605 3 0001 0 CA L
 00285 REF 9 LAST 1371 5606 54 375 1 TS FAILREG
 0029 REF 1 5607 1 5614 0 TCF PROGLARM

IS ANYTHING IN FAILREG
YES TRY NEXT REC

TURN ALARM LIGHT ON FOR FIRST ALARM

0030 REF 10 LAST 1371 5610 10 376 1 CHKFAIL2 CCS FAILREG +1
 0031 REF 2 LAST 1371 5611 1 5614 0 TCF PROGLARM
 0032 REF 254 LAST 1371 5612 3 0001 0 CA L
 0033 REF 11 LAST 1371 5613 54 376 1 TS FAILREG +1

0039 REF 12 LAST 1371 5614 22 377 1 PROGLARM LXCH FAILREG +2

STORE AS "MOST RECENT" ALARM CODE

0040 REF 47 LAST 1307 5615 4 1035 1 CS DSPTAB +11C
 0041 REF 2 LAST 1348 5616 7 5632 1 MASK OCT40400
 0042 REF 48 LAST 1371 5617 27'035 1 ADS DSPTAB +11C

TURN ON PROGRAM ALARM IF CFF

L ALARM AND ABORT

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0043 REF 67 LAST 1371 5620 56 061 0 MULTEX11 XCH ITEMPI
 0044 5621 0 0000 1 RELINT
 0045 REF 458 LAST 1369 5622 50 000 1 INDEX 4
 0046 5623 0 0001 0 TC 1

CERTAIN RETURN ADDRESS IN A

R0051 PRICLARM DISPLAYS VDSK19 VIA PRICDSPR WITH 3 RETURNS TO THE USER FROM THE ASTRONAUT AT CALL LCC +1,+2,+3 AND
 R0053 AN IMMEDIATE RETURN TO THE USER AT CALL LCC +4. EXAMPLE FCLLCWS,
 A0054 CAF OCTXX ALARM CODE
 A0055 TC BANKCALL
 A0056 CADR PRICLARM

A0057 ...
 A0058 ...
 A0059 ...
 A0060 TC PHASCHNG
 A0061 CCT X.1

ASTRONAUT RETURN
 IMMEDIATE RETURN TO USER. RESTART
 PHASE CHANGE FOR PRIO DISPLAY

0062 BANK 10
 0063 REF 3 LAST 1364 10,3563 SETLCC DISPLAYS
 0064 10,2000 BANK
 10,3563

0065 REF 3 LAST 1364 TC 1365: 14 669* COUNT# \$\$/DSPLA
 0066 10,3563 0 0004 0 PRICLARM INHINT
 0067 REF 255 LAST 1371 10,3564 54 001 1 TS L

* * * KEEP IN DISPLAY ROUTINES BANK
 SAVE ALARM CODE

0068 REF 28 LAST 1367 10,3565 3 0133 0 CA RUF2
 0069 REF 6 LAST 1371 10,3566 551263 1 TS ALMCADR
 0070 REF 29 LAST 1372 10,3567 3 0134 1 CA BLF2 +1
 0071 REF 1 10,3570 0 5576 0 TC PRICENT +1
 0072 10,3571 77467 1 -2SEC CFC -200
 0073 REF 6 LAST 923 10,3572 3 5006 1 CAF VC5NCS
 0074 REF 2 LAST 517 10,3573 1 2505 1 TCF PRICDSPR

2 CADR OF PRICLARM USER

* LEAVE L ALONE
 *** CCNT MOVE

0075 5624 BLOCK 02
 0076 REF 2 LAST 1371 4000 SETLCC FFTAG7
 0077 5624 BANK

0078 REF 2 LAST 1371 TC 1372: 29 29* COUNT# \$\$/ALARM
 0079 5624 0 0004 0 BAILCUT INHINT
 0080 REF 376 LAST 1371 5625 3 0002 0 CA C
 0081 REF 7 LAST 1372 5626 551363 1 TS ALMCADR

0082 REF 377 LAST 1372 5627 50 0002 0 INDEX 0
 0083 5630 3 0000 1 CAF 0
 0084 REF 1 5631 0 5574 1 TC BORTENT
 0085 5632 40400 1 OCT40400 CCT 40400

0086 5633 0 0004 0 INHINT
 0087 REF 89 LAST 1359 5634 3 4752 0 WHIMPER CA TWO
 0088 REF 24 LAST 1284 5635 6 0005 1 AD Z

L ALARM AND APCRT

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0089	REF	2	LAST	824	5636	54 017 0	TS	BRUPT	
0090					5637	5 0017 1	RESUME		
0091	REF	59	LAST	1344	5640	0 4635 0	TC	POSTJUMP	RESUME SENDS CONTROL HERE
0092	REF	2	LAST	824	5641	12763 0	CADR	ENFMA	
0093					5642	0 0004 0	INHINT		
0094	REF	378	LAST	1372	5643	3 0002 0	CA	Q	
0095	REF	8	LAST	1372	5644	551363 1	APDPT2	ALMCADR	
0096	REF	379	LAST	1373	5645	50 0002 0	INDEX	Q	
0097					5646	3 0000 1	CAF	Q	
0098	REF	2	LAST	1272	5647	0 5574 1	TC	BCRTENT	
0099					5650	77770 1	CCT7777C	CCT	DON'T MOVE
0100	REF	2	LAST	1088	5651	3 4765 1	CAF	CCT35	4.365PCT FOR CCFCCDCO
0101	REF	256	LAST	1372	5652	54 001 1	TS	L	
0102					5653	4 0000 0	CCM		
0103	REF	9	LAST	860	5654	52 760 1	DXCH	-PHASE4	
0104					5655	0 0004 1	CCPDCCC	INHINT	
01042	REF	304	LAST	1325	5656	0 4616 1	TC	BANKCALL	RESET STATEFLG, REINTFLG, AND NCODEFLAG.
01044	REF	1			5657	27750 0	CADR	FLAGS	
0105	REF	31	LAST	1325	5660	3 0103 0	CA	FLAGWRC7	IS SERVICER CURRENTLY IN OPERATION?
0106	REF	3	LAST	281	5661	7 4746 1	MASK	V37FLBIT	
0107	REF	459	LAST	1372	5662	10 000 0	CCS	A	
0108	REF	1			5663	1 5671 0	TCF	STRTIDLE	
0109	REF	305	LAST	1372	5664	0 4616 1	TC	BANKCALL	TERMINATE GRPS 1, 3, 5, AND 6
0110	REF	2	LAST	231	5665	12650 1	CADR	V37KLEAN	
01102	REF	306	LAST	1373	5666	0 4616 1	TC	BANKCALL	TERMINATE GRPS 2, 4, 1, 3, 5, AND 6
01104	REF	2	LAST	213	5667	12641 1	CADR	MR.KLEAN	(I.E., GRP 4 LAST)
0111	REF	2	LAST	860	5670	1 5634 1	TCF	WHIMPER	
0112	REF	1			5671	2 5733 0	CAF	BESERVOL	
01122	REF	3	LAST	1360	5672	0 4727 1	TC	SUPERSW	
01124	REF	307	LAST	1373	5673	0 4616 1	TC	BANKCALL	PUT SERVICER INTO ITS "GROUND" STATE
01125	REF	1			5674	57321 0	CADR	SERVVIDLE	AND PROCEED TO CECTPCDCT.
0114					5675	0 0004 0	CCSHOLE	INHINT	
0115	REF	300	LAST	1373	5676	3 0002 0	CA	Q	
0116	REF	1			5677	0 5644 1	TC	ABORT2	
0117					5700	21103 0	CCT21103	CCT	21103
0118					5701	0 0004 0	CURTAINS	INHINT	
0119	REF	381	LAST	1373	5702	3 0002 0	CA	Q	
0120	REF	2	LAST	1276	5703	0 5571 1	TC	ALAPM2	
0121					5704	0 0217 0	CCT217	CCT	0 0217
0122	REF	9	LAST	1373	5705	0 1363 0	TC	ALMCADR	RETURN TO USER
0123					5706	0 0004 0	BAILCUT1	INHINT	
0124	REF	10	LAST	1373	5707	531364 0	DXCH	ALMCADR	
0125	REF	1			5710	3 5732 1	CAF	ADR40400	
0126	REF	68	LAST	1372	5711	54 061 1	ROTHABRT	TS	ITFMP1
0127	REF	382	LAST	1373	5712	50 0002 0	INDEX	Q	
0128					5713	3 0000 1	CAF	Q	
0129	REF	257	LAST	1373	5714	54 001 1	TS	L	
0130	REF	1			5715	1 5603 0	TCF	CHKFAIL1	

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0131				5716	0 0004 0	PCODCC1	INHINT	
0132	REF	11	LAST 1373	5717	53 1364 0		EXCH	ALMCADR
0133	REF	1		5720	2 5721 1		CAF	ADR77770
0134	REF	1		5721	1 5711 1		TCF	BOTHABPT
0135				5722	0 0004 0	ALARM1	INHINT	
0136	REF	12	LAST 1374	5723	53 1364 0		EXCH	ALMCADR
0137				5724	0 0004 0	ALMCADR	INHINT	
0138	REF	282	LAST 1373	5725	53 012 0		INDEX	C
0139				5726	2 0000 1		CA	0
0140	REF	258	LAST 1373	5727	54 011 1		TS	L
0141	REF	1		5730	1 5601 1		ICF	LARMENT
0142	REF	5	LAST 1364	5731	1 5650 0	ADR77770	TCF	OCT7777C
0143	REF	2	LAST 1371	5732	1 5632 1	ADP40400	TCF	OCT40400
0144	REF	154	LAST 1370	5155		DCALARM	EQLALS	ENDCFJCB
01444	REF	53	LAST 887	7,1515			EBANK=	DVNCNR
01445	REF	2	LAST 1373	5723	56067 0	BFSERVEL	PECCN	SERVICE

R0145 CALLING SEQUENCE FOR VARALARM

AC146						CAF	(ALARM)	
AC147						TC	VARALARM	

R0148 VARALARM TURNS ON PROGRAM ALARM LIGHT BUT DOES NOT DISPLAY

0149				5734	0 0004 0	VARALARM	INHINT	
------	--	--	--	------	----------	----------	--------	--

0151	REF	259	LAST 1374	5735	54 01 1	TS	L	SAVE USERS ALARM CODE
------	-----	-----	-----------	------	---------	----	---	-----------------------

0151	REF	384	LAST 1374	5736	3 0102 0	CA	Q	SAVE USERS C
------	-----	-----	-----------	------	----------	----	---	--------------

0152	REF	13	LAST 1374	5737	55 263 1	TS	ALMCADR	
------	-----	----	-----------	------	----------	----	---------	--

0153	REF	2	LAST 1372	5740	0 5575 0	TC	PRICENT	
------	-----	---	-----------	------	----------	----	---------	--

0154				5741	0 0014 1	OCT14	CCT	14
------	--	--	--	------	----------	-------	-----	----

CONT MOVE

0155	REF	14	LAST 1374	5742	0 1363 0	TC	ALMCADR	RETURN TO USER
------	-----	----	-----------	------	----------	----	---------	----------------

0156	REF	3	LAST 1373	5634		AEQRT	EQUALS	WHIMPER
------	-----	---	-----------	------	--	-------	--------	---------

0157				13,3750			BANK	13
------	--	--	--	---------	--	--	------	----

0158	REF	1		13,2000			SETLOC	ABTFLOS
------	-----	---	--	---------	--	--	--------	---------

0159				13,3750			BANK	
------	--	--	--	---------	--	--	------	--

0160	REF	1					CCUNT#	\$4/ALARM
------	-----	---	--	--	--	--	--------	-----------

0161	REF	1		13,3750	4 4747 0	FLAGS	CS	STATEBIT
------	-----	---	--	---------	----------	-------	----	----------

0162	REF	21	LAST 1322	13,3751	7 0777 0		MASK	FLAGWRD3
------	-----	----	-----------	---------	----------	--	------	----------

0163	REF	22	LAST 1374	13,3752	54 077 0		TS	FLAGWRD3
------	-----	----	-----------	---------	----------	--	----	----------

0164	REF	3	LAST 1211	13,3753	4 4745 1		CS	REINTPLT
------	-----	---	-----------	---------	----------	--	----	----------

0165	REF	20	LAST 857	13,3754	7 0106 1		MASK	FLGWRD10
------	-----	----	----------	---------	----------	--	------	----------

0166	REF	21	LAST 1374	13,3755	54 1 6 1		TS	FLGWRD10
------	-----	----	-----------	---------	----------	--	----	----------

0167	REF	3	LAST 230	13,3756	4 4753 0		CS	NOCORIT
------	-----	---	----------	---------	----------	--	----	---------

0168	REF	31	LAST 1305	13,3757	7 0776 1		MASK	FLAGWRD2
------	-----	----	-----------	---------	----------	--	------	----------

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0165	REF 32	LAST 1374	13,3760	54.076 1	TS	FLAGWRD2
0170	REF 385	LAST 1374	13,3761	0.0002 0	TC	G

L UPDATE PROGRAM

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R0001 PROGRAM NAME: P27
 R0002 WRITTEN BY: KILREY/ DE KCLF

R0003 MODE M1: 6
 R0004 MODE BY: KILREY
 R0005 DATE: 01DEC67

R0006 LOC SECTION: UPDATE PROGRAM.

R0007 FUNCT. DESCR: P27 (THE UPDATE PROGRAM) PROCESSES COMMANDS AND DATA
 R0008 INSERTIONS REQUESTED BY THE GROUND VIA UPLINK.
 R0009 THE P27 PROGRAM WILL ACCEPT UPDATES
 R0010 ONLY DURING P00 FOR THE LM, AND ONLY DURING P00,
 R0011 P02, AND FRESH START FOR THE CSM

R0012 CALLING SEQ: PPROGRAM IS INITIATED BY UPLINK ENTRY OF VERBS 70, 71, 72 AND 73.

R0014 SUBROUTINES: TESTXACT, NEWMODEX, NEWMODEX +3, GOXCSFF, PANKCALL, FINDVAC, INTPRET, INTSTALL, TTAGREE,
 R0016 INTWAKEU, ENDEXT, POSTJUMP, FALTCN, NEWPHASE, PHASCHG

R0017 NORMAL EXIT: TO ENDEXT

R0018 ALARM/ABORT: TO FALTCN FOLLOWED BY TO ENDEXT

R0019 RESTARTS: P27 IS RESTART PROTECTED IN TWO WAYS...
 R0020 1. PRIOR TO VERIFLAG INVERSION(WHICH IS CAUSED BY THE GROUND/ASTRONAUT'S VERIFICATION OF UPDATE
 R0021 DATA BY SENDING A V23E WHEN V2IND2 IS FLASHING)---
 R0022 NO PROTECTION EXCEPT PRE-P27 MODE IS RESTORED, CCAST + ALIGN DCWLIST IS SELECTED AND UPLINK
 R0023 ACTIVITY LIGHT IS TURNED OFF.(JUST AS IF A V34E WAS SENT DURING P27 DATA LOADS).
 R0025 V7, V71, V72 OR V73 WILL HAVE TO BE COMPLETELY RESENT BY USER.
 R0027 2. AFTER VERIFLAG INVERSION(WHEN UPDATE OF THE SPECIFIED ERASABLES IS BEING PERFORMED)---
 R0028 PROTECTED AGAINST RESTARTS.
 R0029

R0032 DEPRIS: UPBHEF (20C) TEMP STORAGE FOR ADDRESSES AND CONTENTS.
 R0033 UPVERB (1) VERB NUMBER MINUS 70C (E.G. FOR V72, UPVERB = 72C - 70C = 2)
 R0035 UPCLMDI (1) FOR MAJOR MODE INTERRUPTED BY P27.
 R0036 COMPCNMB (1) TOTAL NUMBER OF COMPONENTS TO BE TRANSMITTED.
 R0038 UPCLPNT (1) ACTUAL NUMBER OF COMPONENTS RECEIVED.
 R0039 UPCTEMP (1) SCRATCH, BUT USUALLY CONTAINS COMPONENT NUMBER TO BE CHANGED DURING VERIFY CYCLE

R0041 INFLT:

R0042 ENTRY: DESCRIPTION

R0043 V70EXXXXXFXXXXXX (LIFTOFF TIME INCREMENT) DOUBLE PRECISION OCTAL TIME INCREMENT, XXXXX XXXXX,
 R0045 IS ADDED TO TEPHFN, SUBTRACTED FROM AGC CLOCK(TIME2,TIME1), SUBTRACTED FROM CSM STATE
 R0047 VECTOR TIME(TETCSN) AND SUBTRACTED FROM LM STATE VECTOR TIME(TETLEN).
 R0049 THE OCTAL TIME INCREMENT IS SCALED AT 2(29).

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R0150 V71E1IFAAAAE (CONTIGUOUS BLOCK UPDATE) II-2 OCTAL COMPONENTS,XXXXX,
 R0151 XXXXXF ARE LOADED INTO ERASABLE STARTING AT PCADD, AAAA.
 R0152 XXXXXF IT IS .GF. 3 .AND. .LE. 200.,
 R0153 AND (AAAA + II - 3) DOES NOT PRODUCE AN ADDRESS IN THE
 R0154 S NEXT BANK
 R0155 . SCALING IS SAME AS INTERNAL REGISTERS.

R0156 V72F1IF (SCATTER UPDATE) (II-1)/2 OCTAL COMPONENTS,XXXXX, ARE
 R0157 AAAAEXXXXXF LOADED INTO ERASABLE LOCATIONS, AAAA.
 R0158 AAAAEXXXXXF II IS .GF. 3 .AND. .LE. 190, AND MUST BE ODD.
 R0159 . SCALING IS SAME AS INTERNAL REGISTERS.

R0161 V73FXXXXXXFXXXXX (OCTAL CLOCK INCREMENT) DOUBLE PRECISION OCTAL TIME
 R0162 INCREMENT XXXXX XXXXX, IS ADDED TO THE AGC CLOCK, IN
 R0163 CENTISECONDS SCALED AT (2)28.
 R0164 THIS LOAD IS THE OCTAL EQUIVALENT OF V55.

R0165 OUTPLT: IN ADDITION TO THE ABOVE REGISTER LOADS, ALL UPDATES
 R0166 COMPLY WITH FLAGWORD7.

R0167 ADDITIONAL NOTES: VERB 71, JUST DEFINED ABOVE WILL BE USED TO PERFORM BUT NOT LIMITED TO THE FOLLOWING UPDATES--

R0169 1. CSM/LM STATE VECTOR UPDATE
 R0172 2. REFSMAT UPDATE

R0173 THE FOLLOWING COMMENTS DELINEATE EACH SPECIAL UPDATE----

R0174 1. CSM/LM STATE VECTOR UPDATE (ALL DATA ENTRIES IN OCTAL)

R0175	ENTRIES:	DATA DEFINITION:	SCALE FACTORS:
R0177	V71F	CONTIGUOUS BLOCK UPDATE VERB	
R0178	21F	NUMBER OF COMPONENTS FOR STATE VECTOR UPDATE	
R0180	AAAAE	SCALE OF 'UPSVFLAG'	
R0182	XXXXXF	STATE VECTOR IDENTIFIER: 0001 FOR CSM, 7776 FOR LEM - EARTH SPHERE OF INFLUENCE SCALING	
R0183		0002 FOR CSM, 7775 FOR LEM - LUNAR SPHERE OF INFLUENCE SCALING	
R0184	XXXXXXXXXXXXF	X POSITION	
R0186	XXXXXXXXXXXXF	Y POSITION	
R0188	XXXXXXXXXXXXF	Z POSITION	
R0190	XXXXXXXXXXXXF	X VELOCITY	
R0192	XXXXXXXXXXXXF	Y VELOCITY	
R0194	XXXXXXXXXXXXF	Z VELOCITY	
R0196	XXXXXXXXXXXXF	TIME FROM AGC CLOCK ZERO	
R0198	V33F	VERB 33 TO SIGNAL THAT THE STATE VECTOR IS READY TO BE STORED.	

R0144 2. REFSMAT (ALL DATA ENTRIES IN OCTAL)
 R0145 ENTRIES: DATA DEFINITIONS:

SCALE FACTORS:

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R0147 V71F CONTIGUOUS BLOCK UPDATE WERE
R0148 24F NUMBER OF COMPONENTS FOR REFSMMAT UPDATE
R0150 AAAAAE FCADR OF 'REFSMMAT'
R0152 XXXXXFXXXXXF ROW 1 COLUMN 1 2(-1)
R0154 XXXXXFXXXXXF ROW 1 COLUMN 2 2(-1)
R0156 XXXXXFXXXXXF ROW 1 COLUMN 3 2(-1)
R0158 XXXXXFXXXXXF ROW 2 COLUMN 1 2(-1)
R0160 XXXXXFXXXXXF ROW 2 COLUMN 2 2(-1)
R0162 XXXXXFXXXXXF ROW 2 COLUMN 3 2(-1)
R0164 XXXXXFXXXXXF ROW 3 COLUMN 1 2(-1)
R0166 XXXXXFXXXXXF ROW 3 COLUMN 2 2(-1)
R0168 XXXXXFXXXXXF ROW 3 COLUMN 3 2(-1)
R0170 V33F WFR 33 TO SIGNAL THAT REFSMMAT IS READY TO BE STORED.

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0171 07,3764 BANK 07
0172 REF 7 LAST 298 43,2100 SETLOC EXTVERBS
0173 43,3746 BANK

0174 REF 4 LAST 977 43,1706 EBANK= TEPHEM

0175 REF 1 CCLNT* $1/P27
0176 REF 1 43,3745 3 4755 1 V70UPDAT CAF UP7C COMES HERE CN V70E
0177 REF 2 LAST 262 43,3746 1 3754 0 TCF V73UPDAT +1

0178 REF 1 43,3747 3 4753 1 V71UPDAT CAF UF71 COMES HERE CN V71E
0179 REF 3 LAST 1378 43,3751 1 3754 0 TCF V73UPDAT +1

0180 REF 1 43,3751 3 4752 0 V72UPDAT CAF UF72 COMES HERE CN V72E
0181 REF 4 LAST 1378 43,3752 1 3754 0 TCF V73UPDAT +1

0182 REF 1 43,3753 3 6250 0 V73UPDAT CAF UP73 COMES HERE CN V73E
0183 REF 1 43,3764 55'165 0 +1 TS UPVERBSV SAVE UPVERB UNTIL IT'S OK TO ENTER P27

0184 REF 20 LAST 300 43,3755 0 2076 1 TC TESTXACT GRAB DISPLAY IF AVAILABLE, OTHERWISE
A0185 TURN OPERATOR ERROR* ON AND TERMINATE JCB

0186 REF 23 LAST 1284 43,3756 3 1010 1 CA MCDREG CHECK IF UPDATE ALLOWED
0187 43,3757 0 3006 1 EXTEND FIRST CHECK FOR MCDREG = +0, -0
0188 43,3760 1 3763 1 BZF +3 (+0 = POC, -0 = FRESH START)
0189 REF 60 LAST 1373 43,3761 0 4635 0 UPERROR TC POSTJUMP TURN ON 'OPERATOR ERROR' LIGHT
0190 REF 1 43,3762 11743 1 CADR UPERRCUT GO TO COMMON UPDATE PROGRAM EXIT

01915 REF 1 43,3761 CKMDMCRE = UPERROR
0192 REF 2 LAST 104 43,3763 55'171 1 +3 TS UPCLDMCD SET UPCLDMCD TO ZERO.
0193 REF 2 LAST 1378 43,3764 31'165 1 CAE UPVERBSV SET UPVERB TO INDICATE TO P27

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0194 REF 2 LAST 104 43,3765 55*171 0
 0195 REF 145 LAST 1365 43,3766 3 4753 1
 0196 REF 2 LAST 104 43,3767 55*172 0
 0197 REF 61 LAST 1378 43,3770 0 4635 0
 0198 REF 1 43,3771 11362 0

TS UFFVERP
 CAF ONE
 TS UPCLUNT
 TC PCSTJUMP
 CADR UPPART2

WHICH EXTENDED VERB CALLED 17.

INITIALIZE UPCLUNT TO 1

LEAVE EXTENDED VERB BANK AND
 GO TO UPDATE PROGRAM (P27) BANK.

0211 REF 260 LAST 1367 4755
 0212 REF 146 LAST 1379 4753
 0213 REF 90 LAST 1372 4752
 0214 REF 42 LAST 1362 4750

UP70 EQUALS ZERO
 UP71 EQUALS ONE
 UP72 EQUALS TWO
 UP73 EQUALS THREE

0215
 0216 REF 2 LAST 1216 44,3362
 0217 44,3362

BANK 04
 SETLCC UPDATE2
 BANK

0218 REF 1

COUNT# 55/P27

0219 44,3362

UPPART2

EQUALS

UPDATE PROGRAM - PART 2

0220 REF 114 LAST 1225 04,3362 0 5353 1
 0221 04,3363 07026 1
 0222 04,3364 30000 1
 0223 REF 4 LAST 205 1173
 0224 REF 1 04,3365 03673 0
 0224 REF 1 04,3366 10112 0

TC PHASCHNG
 OCT 07026
 OCT 30000
 EPANK= UPRUFF
 20ADR UPCLUNT +1

SET RESTART GROUP 6 TO RESTORE CLC MODE
 AND DOWNLIST AND EXIT IF RESTART OCCURS.
 PRIORITY SAME AS CRPRIO

0225 REF 147 LAST 1379 04,3367 3 4753 1
 0226 REF 9 LAST 984 04,3370 54 333 0

CAF ONE
 TS PALSTCCC

DOWNLIST

0227 REF 6 LAST 795 04,3371 0 5211 1
 0228 04,3372 00333 1

TC NEWMODEX
 DEC 27

SET MAJOR MODE = 27

0229 REF 3 LAST 1379 04,3373 51*171 1
 0230 04,3374 1 3375 1
 0231 04,3375 1 3400 1
 0232 REF 1 04,3376 1 3403 1
 0233 REF 2 LAST 1379 04,3377 1 3403 1
 0234 REF 61 LAST 1379 04,3400 3 4752 0
 0235 REF 3 LAST 205 04,3401 55*167 1
 0236 REF 1 04,3402 1 3426 0

INDEX UFFVERP
 TCF +1
 TCF +3
 TCF OHWELL1
 TCF OHWELL1
 CA TWO
 TS COMPLUMB
 TCF OHWELL2

BRANCH DEPENDENT ON WHETHER THE UPDATE
 VERB REQUIRES A FIXED OR VARIABLE NUMBER
 V70 FIXED. (OF COMPONENTS.
 V71 VARIABLE - GO GET NO. OF COMPONENTS
 V72 VARIABLE - GO GET NO. OF COMPONENTS
 V73 (AND V70) FIXED
 SET NUMBER OF COMPONENTS TO 2.
 GO GET THE TWO UPDATE COMPONENTS

0237 REF 1 04,3403 3 3476 1 OHWELL1
 0238 REF 836 LAST 1362 04,3404 54 156 1
 0239 REF 1 04,3405 3 3477 0 +2
 0240 REF 308 LAST 1373 04,3406 0 4616 1
 0241 REF 11 LAST 717 04,3407 21334 1

CAF ACUPRUFF
 TS MFAC +2
 CAF UPLDACNV
 TC BANKCALL
 CADR GOXDSPE

* REQUEST USER TO SEND NUMBER *
 * OF COMPONENTS PARAMETER(11). *
 (CK4V32 RETURNS HERE IF V32 ENCLUSTERED)
 DISPLAY A FLASHING V21001
 TO REQUEST 11.

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0242	REF	1		04,3410	1 3673 1	TCF	UPPUT4	V34 TERMINATE UPDATE(P27) RETURN
0243	REF	3	LAST 1379	04,3411	1 3415 1	TCF	CHWELL1 +2	
0244	REF	1		04,3412	0 3467 1	TC	CK4V32	DATA CR V32 RETURN
0245	REF	49	LAST 1275	04,3413	4 4752 1	CS	BIT2	
0246	REF	5	LAST 1375	04,3414	6 1173 1	AD	UPBUFF	IS 11 (NUMBER OF COMPONENTS PARAMETER)
0247				04,3415	0 0006 1	EXTEND		.00. 3 AND .00. 200.
0248	REF	4	LAST 1380	04,3416	6 3475 0	BZMF	CHWELL1 +2	
0249	REF	6	LAST 1380	04,3417	4 1173 1	CS	UPBUFF	
0250	REF	1		04,3420	6 4362 1	AD	UP21	
0251				04,3421	0 0116 1	EXTEND		
0252	REF	5	LAST 1380	04,3422	6 3415 0	BZMF	CHWELL1 +2	
0253	REF	7	LAST 1380	04,3423	31 1173 0	CAE	UPBUFF	
0254	REF	4	LAST 1375	04,3424	55 1167 1	TS	COMPNUMB	SAVE 11 IN COMPNUMB

R0257 UPBUFF LOADING SEQUENCE

02571	REF	3	LAST 1375	04,3425	25 1172 1	INCR	UPCOUNT	INCREMENT COUNT OF COMPONENTS RECEIVED.
0258	REF	1		04,3426	3 3643 0	CAF	ATUPBFM1	CALCULATE LOCATION(ECADR) IN UPBUFF
0259	REF	4	LAST 1380	04,3427	6 1172 1	AD	UPCOUNT	WHERE NEXT COMPONENT SHOULD BE STORED.
0260	REF	837	LAST 1379	04,3430	54 156 1	TS	MPAC +2	PLACE ECADR INTO R3.
0261	REF	2	LAST 1375	04,3431	3 2477 0	CAF	UPCADNV	(CK4V32 RETURNS HERE IF V32 ENCOUNTERED)
0262	REF	319	LAST 1379	04,3432	0 4616 1	TC	BANKCALL	DISPLAY A FLASHING V21N01
0263	REF	12	LAST 1375	04,3433	20334 1	CADR	GXCDSFF	TO REQUEST DATA.
0264	REF	2	LAST 1380	04,3434	1 3673 1	TCF	UPPUT4	V34 TERMINATE UPDATE(P27) RETURN.
0265	REF	2	LAST 1379	04,3435	1 3431 0	TCF	CHWELL2 +3	V33 PROCEED RETURN
0266	REF	2	LAST 1380	04,3436	0 3467 1	TC	CK4V32	DATA CR V32 RETURN
0267	REF	5	LAST 1380	04,3437	4 1172 0	CS	UPCOUNT	HAVE WE FINISHED RECEIVING ALL
0268	REF	5	LAST 1380	04,3440	6 1167 0	AD	COMPNUMB	THE DATA WE EXPECTED.
0269				04,3441	0 0006 1	EXTEND		
0270	REF	1		04,3442	6 3444 0	BZMF	UPVERIFY	YES- GO TO VERIFICATION SEQUENCE
0272	REF	3	LAST 1380	04,3443	1 3425 0	TCF	CHWELL2 -1	NO- REQUEST ADDITIONAL DATA.

R0273 VERIFY SEQUENCE

0274	REF	1		04,3444	3 3475 1	UPVERIFY	CAF	ADUPTMP	PLACE ECADR WHERE COMPONENT NO. INDEX
0275	REF	838	LAST 1380	04,3445	54 156 1	TS	MPAC +2	IS TO BE STORED INTO R3.	
0276	REF	1		04,3446	3 3530 1	CAF	UPVRFYNV	(CK4V32 RETURNS HERE IF V32 ENCOUNTERED)	
0277	REF	310	LAST 1380	04,3447	0 4616 1	TC	BANKCALL	DISPLAY A FLASHING V21N02 TO REQUEST	
0278	REF	13	LAST 1380	04,3450	20334 1	CADR	GXCDSFF	DATA CORRECTION OR VERIFICATION.	
0279	REF	3	LAST 1380	04,3451	1 3673 1	TCF	UPPUT4	V34 TERMINATE UPDATE(P27) RETURN	
0280	REF	1		04,3452	1 3511 1	TCF	UPSTORE	V33 DATA SENT IS GOOD. GO STORE 17.	
0281	REF	3	LAST 1380	04,3453	3 2467 1	TC	CK4V32	COMPONENT NO. INDEX OR V32 RETURN	
0282	REF	4	LAST 1380	04,3454	3 1166 1	CA	UPTMP	DOES THE COMPONENT NO. INDEX JUST SENT	
0283				04,3455	0 0006 1	EXTEND		SPECIFY A LEGAL COMPONENT NUMBER?	
0284	REF	2	LAST 1380	04,3456	6 3444 0	BZMF	UPVERIFY	NO, IT IS NOT POSITIVE NONZERO	
0285	REF	5	LAST 1380	04,3457	4 1166 0	CS	UPTMP		
0289	REF	6	LAST 1380	04,3460	6 1167 0	AD	COMPNUMB		
0289	REF	55	LAST 1317	04,3461	6 4753 1	AD	BIT1		

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0290				04,3462	0 0006 1	EXTEND		
0291	REF	3	LAST 1380	04,3463	6 2444 0	BZMF	UPVERIFY	NC
0292	REF	2	LAST 1380	04,3464	3 3643 0	CAF	ADUPBFM1	YES- BASED ON THE COMPONENT NO. INDEX
0293	REF	6	LAST 1380	04,3465	6 1166 1	AD	UPTEMP	CALCULATE THE EADDR OF LOCATION IN
0294	REF	4	LAST 1380	04,3466	1 3431 1	TCF	DEWELL2 +2	UPBLFF WHICH USER WANTS TO CHANGE.
0295	REF	2	LAST 1375	04,3672		UPCUT4	EQUALS UPCT +1	COMES HERE ON V34 TO TERMINATE UPDATE

R1206 CHECK FOR VERR 22 SEQUENCE

0297	REF	839	LAST 1380	04,3407	4 0154 0	CK4V32	CS	MFAC	ON DATA RETURN FROM 'GCXCSPE'
0298	REF	61	LAST 1356	04,3470	7 4746 1		MASK	BIT6	ON DATA RETURN FROM 'GCXCSPE' THE CON-
0299	REF	460	LAST 1373	04,3471	10 0000 0		CCS	A	TENTS OF MFAC = VERR. SC TEST FOR V32.
0300	REF	366	LAST 1375	04,3472	0 3002 0		TC	G	IT'S NOT A V32, IT'S DATA. PROCEED.
0301	REF	387	LAST 1381	04,3473	50 102 0		INDEX	0	
0302				04,3474	7 7771 0		TC	0 -6	V32 ENCOUNTERED - GO BACK AND GET DATA
0305	REF	7	LAST 1381	04,3475	01166 1	ADUPTEMP	ADRES	UPTEMP	ADDRESS OF TEMP STORAGE FOR CORRECTIONS
0306	REF	8	LAST 1380	04,3476	01173 0	ADUPBUFF	ADRES	UPBUFF	ADDRESS OF UPDATE DATA STORAGE BUFFER
0307				04,3477	05201 1	UPLOCENV	VN	2101	VERR 21 NOUN 01
0308				04,3478	05202 1	UPVREFYN	VN	2102	VERR 21 NOUN 02
0309	REF	4	LAST 1091	4362		UP21	=	MD1	DFC 21 = MAX NO OF COMPONENTS +1
03121	REF	22	LAST 1346	4756		UPCTEHAS	EQUALS	FIVE	

R1313 PRE-STORE AND E/A TO APPROPRIATE BRANCH SEQUENCE

0314				04,3501		UPSTORE	EQUALS		GROUND HAS VERIFIED UPDATE. STORE DATA.
0315				04,3501	0 0004 0			INHINT	
0316	REF	32	LAST 1373	04,3502	30 103 0	CAF	FLAGWRD7		INVERT VERIFLAG (BIT3 OF FLAGWRD7) TO
0317	REF	260	LAST 1374	04,3503	56 001 0	XCF	L		INDICATE TO THE GROUND (VIA DOWNLINK)
0318	REF	1		04,3504	3 4751 0	CAF	VERIFBIT		THAT THE V33 (WHICH THE GROUND SENT TO
0319				04,3505	0 0006 1	EXTEND			VERIFY THE UPDATE) HAS BEEN SUCCESSFULLY
0320	REF	17	LAST 1365	04,3506	06 001 0	RXCRC	LCHAN		RECEIVED BY THE UPDATE PROGRAM
0321	REF	33	LAST 1381	04,3507	54 103 1	TS	FLAGWRD7		
0322	REF	115	LAST 1375	04,3509	0 5353 1	TC	PHASCHNG		SET RESTART GROUP 6 TO RECD THE UPDATE
0323				04,3511	04 026 1	OCT	04026		DATA STORE IF A RESTART OCCURS.
0324				04,3512	0 0004 0	INHINT			(BECAUSE PHASCHNG DID A RELINT)
0325	REF	92	LAST 1375	04,3513	4 4752 1	CS	TWC		GO TO UPENVCAC IF INSTALL IS REQUIRED,
0326	REF	4	LAST 1375	04,3514	6 1171 1	AD	UPVERR		THAT IS, IF IT'S A V71 - V72.
0327				04,3515	0 0006 1	EXTEND			GO TO UPEND73 IF IT'S A V73.
0328	REF	1		04,3516	6 3525 0	BZMF	UPENVCAC		

R0331 VERR 73 BRANCH

0331				04,3517	0 0006 1	UPEND73	EXTEND		V73-PERFORM OF OCTAL AGC CLOCK INCREMENT
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0332	REF	9	LAST	1381	04,3521	3 1174 1	CCA	UPBUFF		
0333	REF	10	LAST	1382	04,3521	53'204 1	CXCH	UPBUFF +80		
0334	REF	1			04,3522	0 3550 1	TC	TIMEDIOL		
0335	REF	8	LAST	829	04,3523	0 4364 1	TC	FALCON	ERROR- TURN ON *OPERATOR ERROR* LIGHT	
0336	REF	2	LAST	1381	04,3524	0 2673 0	TC	UPOUT +1	GO TO COMMON UPDATE PROGRAM EXIT	
0337	REF	7	LAST	1328	04,3525	3 4355 0	UPENCVAC	CAF	CHPRPID	(USE EXTENDED VERB PRIORITY)
0338	REF	45	LAST	1357	04,3526	0 5105 0	TC	FINDVAC	GET VAC AREA FOR 'CALL INSTALL'	
0339	REF	5	LAST	1378	04,3526	53,1716	EPANK=	TEPHEN		
0340	REF	1			04,3527	03532 1	2CADR	UPJOB	(NOTE: THIS WILL ALSO SET FBANK FOR	
0341	REF	1			04,3530	10172 1				
0341	REF	157	LAST	1374	04,3531	0 5155 0	TC	ENDCFJCB	'TEPHEN' UPDATE BY V70)	
0342	REF	239	LAST	1255	04,3532	0 6042 1	UPJCB	TC	INTERPT	THIS COULD BE A STATE VECTOR UPDATE--SC
0343					04,3533	77624 1	CALL			WAIT(PUT JCB TO SLEEP) IF ORBIT INT(01)
0344	REF	30	LAST	1214	04,3534	27412 0			INSTALL	IS IN PROGRESS--CF--GRAF CI AND RETURN
A0345										TO UPWAKE IF CI IS NOT IN PROGRESS.
0346					04,3535	77776 1	UPWAKE	EXIT		
0347	REF	116	LAST	1381	04,3536	0 5353 1	TC	PHASCHNG	RESTART PROTECT(GROUP 6)	
0343					04,3537	04026 1	CCT	04026		
0350	REF	75	LAST	1355	04,3540	0 5504 0	TC	UPFLAG	SET INTEGRATION RESTART BIT	
0351	REF	5	LAST	1233	04,3541	00236 0	ADPES	REINTEFLG		
0352					04,3542	0 0014 0	INHINT			
0355					04,3543		UPPART3	EQUALS		
0356	REF	5	LAST	1381	04,3543	51'171 1	INDEX	UPVERB	BRANCH TO THE APPROPRIATE UPDATE VERB	
0357					04,3544	1 3545 1	TCF	+1	ROUTINE TO ACTUALLY PERFORM THE UPDATE	
0358	REF	1			04,3545	1 3704 0	TCF	UPEND70	V70	
0359	REF	1			04,3546	1 2612 1	TCF	UPEND71	V71	
0360	REF	1			04,3547	1 3645 1	TCF	UPEND72	V72	

R0361 ROUTINE TO INCREMENT CLOCK(TIME2,TIME1) WITH CONTENTS OF CF WORD AT UPBUFF.

0363					04,3550	0 0016 1	TIMEDIOL	EXTEND		
0364	REF	9	LAST	1381	04,3551	23'166 1	CXCH	UPTMP	SAVE Q FOR RETURN	
0365	REF	261	LAST	1379	04,3552	3 4755 1	CAF	ZERC	ZERC AND SAVE TIME2,TIME1	
0366					04,3553	22 017 0	ZL			
0367	REF	36	LAST	1327	04,3554	52 025 1	CXCH	TIME2		
0368	REF	11	LAST	1382	04,3555	53'216 1	CXCH	UPBUFF +180	STORE IN CASE OF OVERFLOW	
0369	REF	1			04,3556	3 4756 1	CAF	UPDTPHAS	DO	
0370	REF	261	LAST	1381	04,3557	54 011 1	TS	L	A	
0371					04,3560	4 0000 0	CCM		QUICK	
03711	REF	4	LAST	860	04,3561	52 764 0	CXCH	-PHASE6	PHASCHNG	
0372					04,3562	0 0004 0	TIMEDIOL	INHINT		

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0373	REF 262	LAST 1382	04,3563	3 4755 1	CAF	ZERO	
0374			04,3564	22 007 0	ZL		PICK UP INCREMENTER(AND ZERO
0375	REF 840	LAST 1381	04,3565	54 156 1	TS	MPAC +2	IT IN CASE OF RESTARTS) AND
0376	REF 12	LAST 1382	04,3566	52 204 1	CXCH	UPBUFF +80	STORE IT
0377	REF 841	LAST 1383	04,3567	52 155 1	CXCH	MPAC	INTC MPAC FOR TPAGREE.
0378			04,3570	0 0006 1	EXTEND		
0379	REF 13	LAST 1383	04,3571	2 1216 0	CCA	UPBUFF +180	
0380	REF 842	LAST 1383	04,3572	21 155 1	DAS	MPAC	FORM SUM IN MPAC
0381			04,3573	0 0006 1	EXTEND		
0382	REF 1		04,3574	1 2602 0	BZF	DELTATCH	TEST FOR OVERFLOW
0383	REF 263	LAST 1382	04,3575	3 4755 1	CAF	ZEPG	
0384	REF 14	LAST 1383	04,3576	52 216 1	CXCH	UPBUFF +180	OVERFLOW, RESTORE OLD VALUE OF CLOCK
0385	REF 37	LAST 1382	04,3577	20 025 1	DAS	TIME2	AND TURN ON OPERATOR ERROR
0386	REF 117	LAST 1382	04,3600	0 5353 1	TC	PHASCHNG	RESTART PROTECT(GROUP 6)
0387			04,3601	04026 1	CCT	04026	
0388	REF 3	LAST 1382	04,3612	0 1166 1	TC	UPTMP	GO TO EFFOR EXIT
0389	REF 18	LAST 1327	04,3613	0 7262 0	DELTATCH TC	TPAGREE	FORCE SIGN AGREEMENT
0390	REF 943	LAST 1383	04,3614	52 155 1	CXCH	MPAC	
0391	REF 38	LAST 1383	04,3615	20 025 1	DAS	TIME2	INCREMENT TIME2,TIME1
0392	REF 118	LAST 1383	04,3616	0 5353 1	TC	PHASCHNG	RESTART PROTECT(GROUP 6)
0393			04,3617	04026 1	CCT	04026	
0394			04,3610	0 0004 0	INFINIT		
0395	REF 10	LAST 1383	04,3611	51 156 1	INDEX	UPTMP	(DOED THIS WAY FOR RESTART PROTECTION)
0396			04,3612	0 0001 0	TC	1	NORMAL RETURN
R0397		VFR 71 BRANCH					
0402	REF 15	LAST 1382	04,3613	21 1174 1	UPEND71 CAF	UPBUFF +1	SET FEANK
0403	REF 81	LAST 1354	04,3614	54 013 0	TS	EBANK	AND
0404	REF 20	LAST 1314	04,3615	7 4357 0	MASK	LCH8	CALCULATE
0405	REF 11	LAST 1383	04,3616	55 156 0	TS	UPTMP	S-REG VALUE OF RECEIVING AREA
0406	REF 5	LAST 1314	04,3617	6 7751 1	AD	NFG3	IN THE PROCESS OF
0407	REF 7	LAST 1380	04,3620	6 1167 0	AD	CCPNUMB	PERFORMING
0408			04,3621	0 0006 1	EXTEND		THIS UPDATE
0409	REF 1		04,3622	1 3630 0	BZF	STORLP71	WILL WE
0410	REF 21	LAST 1322	04,3623	7 4742 1	MASK	BIT9	OVERFLOW
0411	REF 461	LAST 1381	04,3624	10 000 0	CCS	A	INTO THE NEXT EBANK....
0412	REF 2	LAST 1378	04,3625	1 2741 1	TCF	UPERRCUT	YES
0413	REF 6	LAST 1382	04,3626	3 7751 1	CA	NFG3	NC- CALCULATE NUMBER OF
0414	REF 9	LAST 1383	04,3627	6 1167 0	AD	CCPNUMB	WORDS TO BE STORED MINUS ONE
0415	REF 844	LAST 1382	04,3630	54 154 0	TS	MPAC	SAVE NC. OF WORDS REMAINING MINUS ONE
0416	REF 462	LAST 1383	04,3631	50 000 1	INDEX	A	TAKE NEXT UPDATE WORD FROM
0417	REF 16	LAST 1382	04,3632	3 1175 0	CA	UPBUFF +2	UPBUFF AND

L UPDATE PROGRAM

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0418	REF 262	LAST 1382	04,3633	54 001 1	TS	L	SAVE IT IN L
0419	REF 845	LAST 1383	04,3634	3 1154 1	CA	MFAC	CALCULATE NEXT
0421	REF 12	LAST 1383	04,3625	6 1166 1	AD	UPTEMP	RECEIVING ADDRESS
0421	REF 463	LAST 1383	04,3636	50 000 1	INDEX	A	
0422			F3,1400		EBANK=	1400	
0423			04,3637	23 1400 1	LXCH	1400	UPDATE THE REGISTER BY CONTENTS OF L
0424	REF 6	LAST 1382	53,1776		EBANK=	TEMPH	
0425	REF 846	LAST 1384	04,3640	10 154 0	CCS	MFAC	ARE THERE ANY WORDS LEFT TO BE STORED
0426	REF 2	LAST 1383	04,3641	1 3630 0	TCF	STOPLP71	YES
0427	REF 4	LAST 1382	04,3642	1 3672 0	TCF	UPCUT	NO- THEN EXIT UPDATE PROGRAM
0428	REF 17	LAST 1383	04,3643	0 1172 1	ADUPPEM1	ADRES	SAME AS ADUPBLFF BUT LESS 1 (DON'T MOVE)
0429	REF 5	LAST 1384	04,3644	1 3672 0	TCF	UPPUT	NO- EXIT UPDATE/HFIF WHEN CCMPNMB = 3)

P0430 VERB 72 FRANCH

0431	REF 56	LAST 1380	04,3645	3 4753 1	UPENC72	CAF	BIT1	HAVE AN ODD NO. OF COMPONENTS
0432	REF 9	LAST 1383	04,3646	7 1167 1		MASK	CCMPNUMB	BEEN SENT FOR A V72 UPDATE...
0433	REF 464	LAST 1384	04,3647	10 000 0		CCS	A	
0434			04,3650	1 3652 1		TCF	+2	YES
0435	REF 3	LAST 1382	04,3651	1 3741 1		TCF	UPERRCUT	EPRCR- SHOULD BE ODD NO. OF COMPONENTS
0451	REF 50	LAST 1381	04,3652	4 4752 1		CS	BIT2	
0452	REF 11	LAST 1384	04,3653	6 1167 0		AC	CCMPNUMB	
0453	REF 847	LAST 1384	04,3654	54 154 0	LDLOC72	TS	MFAC	NOW PERFORM THE UPDATE
0454	REF 465	LAST 1384	04,3655	50 000 1		INDEX	A	
0455	REF 18	LAST 1384	04,3656	31 174 1		CAF	UPBUFF +1	PICK UP NEXT UPDATE WORD
0456	REF 466	LAST 1384	04,3657	22 000 1		LXCH	A	
0457	REF 848	LAST 1384	04,3660	10 154 0		CCS	MFAC	SET PCOUNTER TO ECADR (LAST EE CCS)
0458	REF 849	LAST 1384	04,3661	54 154 0		TS	MFAC	
0459	REF 467	LAST 1384	04,3662	50 000 1		INDEX	A	
0460	REF 19	LAST 1384	04,3663	31 174 1		CAF	UPBUFF +1	PICK UP NEXT ECADR OF PEG TO BE UPDATED
0461	REF 82	LAST 1383	04,3664	54 000 0		TS	EBANK	SET EBANK
0462	REF 21	LAST 1383	04,3665	7 4357 0		MASK	LOW8	ISOLATE RELATIVE ADDRESS
0463	REF 468	LAST 1384	04,3666	50 000 1		INDEX	A	
0464			F3,1400			EBANK=	1400	
0465			04,3667	23 1400 1		LXCH	1400	UPDATE THE REGISTER BY CONTENTS OF L
0466	REF 7	LAST 1384	53,1776			EBANK=	TEMPH	
0467	REF 850	LAST 1384	04,3670	10 154 0		CCS	MFAC	ARE WE THROUGH THE V72 UPDATE...
0468	REF 1		04,3671	1 3654 1		TCF	LDLOC72	NO

P0469 NORMAL FINISH OF P27

0470			04,3672		UPPUT	EQUALS		
0471	REF 1		04,3672	0 3147 0		TC	INTWAKEFI	RELEASE GRAB OF ORBITAL INTEGRATION
0472	REF 3	LAST 1378	04,3673	31 174 0	+1	CAF	UPCLDMPD	RESTORE EPRCR P27 MODE
0473	REF 7	LAST 1375	04,3674	0 5314 1		TC	NEWMODEX +3	
0474	REF 264	LAST 1382	04,3675	3 4755 1		CAF	ZEFF	
0475	REF 10	LAST 1375	04,3676	54 333 0		TS	DALSTCDD	
0476	REF 1		04,3677	0 3745 1		TC	UPACTOFF	TURN OFF 'LPLINK ACTIVITY' LIGHT

L UPDATE PROGRAM

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0477 04,3710 0 0016 1
 0478 RFF 26 LAST 1303 04,3711 3 4755 1
 0479 RFF 5 LAST 1392 04,3712 52 764 0
 0480 RFF 43 LAST 718 04,3713 0 5472 0

EXTEND
 CCA NECD
 EXCH -PHASE6

KILL GROUP 6.

TC ENDFX1

EXTENDED VERB EXIT

R04P1 VERB 7C BRANCH

0482 04,3714 0 0016 1
 0483 RFF 20 LAST 1384 04,3715 4 1174 0
 0484 RFF 21 LAST 1385 04,3716 53 204 1
 0485 RFF 2 LAST 1382 04,3717 0 3550 1

LPEND7J EXTEND
 DCS UPBUFF
 EXCH UPBUFF +8C
 TC TIMEDINL

V7C DCES THE FOLLOWING WITH PP DELTA
TIME IN UPBUFF

DECREMENT AGC CLOCK

0486 RFF 4 LAST 1384 04,3710 0 3741 0

TC UPERRCUT

ERROR WHILE DECREMENTING CLOCK -- EXIT

0487 RFF 9 LAST 1384 03,1716
 0488 04,3711 0 0016 1
 0489 RFF 22 LAST 1385 04,3712 4 1174 0
 0490 RFF 23 LAST 1385 04,3713 53 204 0
 0491 04,3714 0 0016 1
 0492 RFF 24 LAST 1385 04,3715 4 1174 1
 0493 RFF 25 LAST 1385 04,3716 53 211 1

EBANK= TEPHEM
 EXTEND
 DCS UPBUFF
 EXCH UPBUFF +10C
 EXTEND
 DCS UPBUFF
 EXCH UPBUFF +12C

CCFY DECREMENTS FOR
RESTART PROTECTION

0494 RFF 119 LAST 1383 04,3717 0 5353 1
 0495 04,3720 0 4026 1

TC PHASCHNG
 CCT 04026

RESTART PROTECT(GROUP 6)

0496 RFF 26 LAST 1384 04,3721 3 4755 1
 0497 04,3722 22 007 0
 0498 RFF 26 LAST 1385 04,3723 53 216 0
 0499 RFF 5 LAST 502 04,3724 21 571 1

CAF ZERO
 ZL
 EXCH UPBUFF +10C
 CAS TETCSM

DECREMENT CSM STATE VECTOR TIME

0500 RFF 266 LAST 1385 04,3725 3 4755 1
 0501 04,3726 22 007 0
 0502 RFF 27 LAST 1385 04,3727 53 210 1
 0503 RFF 4 LAST 625 04,3728 21 442 0

CAF ZERO
 ZL
 EXCH UPBUFF +12C
 DAS TETLEM

DECREMENT LEM STATE VECTOR TIME

0504 RFF 267 LAST 1385 04,3731 3 4755 1
 0505 04,3732 22 007 0
 0506 RFF 28 LAST 1385 04,3733 53 174 0
 0507 RFF 9 LAST 1385 04,3734 21 710 1
 0508 RFF 10 LAST 1385 04,3735 27 706 0

CAF ZERO
 ZL
 EXCH UPBUFF
 CAS TEPHEM +1
 ADS TEPHEM

INCREMENT TP TEPHEM

0509 RFF 120 LAST 1385 04,3736 0 5353 1
 0510 04,3737 0 4026 1

TC PHASCHNG
 CCT 04026

RESTART PROTECT(GROUP 6)

0511 RFF 29 LAST 1385 1173

EBANK= UPRLFF

0512 RFF 6 LAST 1384 04,3740 0 3672 1

TC UPCLUT

GO TO STANDARD UPDATE PROGRAM EXIT

L UPDATE PROGRAM

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R0513 ERROR SEQUENCE

0514	RFF	6	LAST 1382	04,3741	0 4364 1	UPERRCT TC	FALCON	TURN ON OPERATOR ERROR* LIGHT
0515	RFF	7	LAST 1385	04,3742	1 3672 0	TCF	UPCLT	GO TO COMMON UPDATE PROGRAM EXIT

0516	RFF	11	LAST 1386	04,3742	0 4364 1	+2	TC	FALCON	TURN ON OPERATOR ERROR* LIGHT
0517	RFF	2	LAST 1384	04,3744	0 3746 1		TC	UPACTOFF	TURN OFF UPLINK ACTIVITY LIGHT
0518	RFF	44	LAST 1385	04,3745	0 5472 0		TC	ENDEXIT	EXTENDED VERB EXIT

(THE PURPOSE OF UPERRCT +2 EXIT IS
TO PROVIDE AN ERROR EXIT WHICH DOES NOT
RESET ANY RESTART GROUPS)

A0519
A0520
A0521
A0522

R0523 : UPACTOFF: IS A ROUTINE TO TURN OFF UPLINK ACTIVITY LIGHT ON ALL EXITS FROM UPDATE PROGRAM(P27).

0525	RFF	32	LAST 1359	04,3746	4 4751 1	UPACTOFF CS	BIT3	
0527				04,3747	0 0006 1		EXTEND	TURN OFF UPLINK ACTIVITY LIGHT
0529	RFF	36	LAST 1357	04,3750	02 011 1		WAND	(BIT 3 OF CHANNEL 11)
0530	RFF	388	LAST 1381	04,3751	0 0002 0		TC	G

L RTP OF CCDES

LSFF'S PAGE NO. 1 EQ S4

0001 22,3773 BANK 22
 0002 REF 1 10,2000 SFTLCC RTECCDES
 0003 10,3574 BANK

0004 REF 14 LAST 1255 5,1654 EPANK= XNF
 0005 REF 1 COLINT* \$\$/RTP

R0006 LOAD TIME2, TIME1 INTO MPAC:

0007 10,2574 0 0006 1 LOADTIME EXTEND
 0008 REF 30 LAST 1383 10,3575 3 0025 0 DCA TIME2
 0009 REF 2 LAST 1011 10,3576 1 6.60 0 TCF SLOAE2

R0010 CONVERT THE SINGLE PRECISION 2'S COMPLEMENT NUMBER ARRIVING IN MPAC (SCALED IN HALF-REVOLUTIONS) TO A
 R0012 CP 1'S COMPLEMENT NUMBER SCALED IN REVOLUTIONS.

0016 REF 851 LAST 1384 10,2577 10 154 0 COLLOGIC COS MPAC
 0017 REF 268 LAST 1385 10,2600 3 4755 1 CAF ZFPO
 0018 10,3611 1 3674 1 TCF +3
 0019 10,3602 13 603 0 NCCP
 0020 REF 28 LAST 1094 10,3603 4 4736 0 CS HALF
 0021 REF 852 LAST 1387 10,3614 54 155 1 TS MPAC +1
 0022 REF 269 LAST 1387 10,3615 3 4755 1 CAF ZFPO
 0023 REF 853 LAST 1387 10,3616 56 154 1 XCF MPAC
 0024 10,3617 0 0006 1 EXTEND
 0025 REF 29 LAST 1387 10,3610 7 4736 0 MP HALF
 0026 REF 854 LAST 1387 10,3611 20 155 1 CAS MPAC
 0027 REF 61 LAST 1272 10,2612 1 6064 1 TCF DANZIG

MODE IS ALREADY AT DOUBLE-PRECISION

R0054 FORCE TO SIGN AGREEMENT IN MPAC:

0055 REF 19 LAST 1383 10,2613 0 7262 0 SGNAGREE TC TPACREF
 0056 REF 62 LAST 1387 10,2614 1 6764 1 TCF DANZIG

R0057 CONVERT THE CP 1'S COMPLEMENT ANGLE SCALED IN REVOLUTIONS TO A SINGLE PRECISION 2'S COMPLEMENT ANGLE
 R0059 SCALED IN HALF-REVOLUTIONS.

0060 REF 1 10,3615 0 3645 0 IST02S TC 1TC2SLB
 0061 REF 270 LAST 1387 10,3616 3 4755 1 CAF ZFPO
 0062 REF 855 LAST 1387 10,3617 54 155 1 TS MPAC +1
 0063 REF 5 LAST 1039 10,2620 1 6063 0 TCF NFWMCDE

R0064 DO IST02S ON A VECTOR OF ANGLES:

0065 REF 2 LAST 1387 10,2621 0 3645 0 VIST02S TC 1TC2SLB ANSWER ARRIVES IN A AND MPAC.
 0066 REF 856 LAST 1387 10,2622 52 162 0 EXCH MPAC +5
 0067 REF 857 LAST 1387 10,2623 52 155 1 EXCH MPAC
 0068 REF 3 LAST 1387 10,2624 0 3645 0 TC 1TC2SLB

L RTB CP CODES

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0069	REF 858	LAST 1387	10,3625	54 156 1	TS	MPAC +2
0070	REF 859	LAST 1388	10,3625	52 160 1	CXCH	MPAC +3
0071	REF 860	LAST 1388	10,3627	52 155 1	CXCH	MPAC
0072	REF 4	LAST 1387	10,3630	0 3645 0	TC	1TC2SLR
0073	REF 861	LAST 1388	10,3631	54 155 1	TS	MPAC +1
0074	REF 862	LAST 1388	10,3632	3 0161 1	CA	MPAC +5
0075	REF 863	LAST 1388	10,3633	54 154 0	TS	MPAC
0076	REF 148	LAST 1379	10,3634	3 4753 1	TPWCEE	CAF CNE
0077	REF 6	LAST 1387	10,3635	1 6163 0	TCF	NEWWCEE

MODE IS TP.

R0078 V1ST02S FOR 2 COMPONENT VECTOR. USED BY RR.

0079	REF 5	LAST 1388	10,3636	0 3645 0	2V1ST02S TC	1TC2SLR
0080	REF 864	LAST 1388	10,3637	52 160 1	CXCH	MPAC +3
0081	REF 865	LAST 1388	10,3640	52 155 1	CXCH	MPAC
0082	REF 6	LAST 1388	10,3641	0 3645 0	TC	1TC2SLR
0083	REF 263	LAST 1384	10,3642	54 011 1	TS	L
0084	REF 866	LAST 1388	10,3643	3 0157 1	CA	MPAC +3
0085	REF 3	LAST 1387	10,3644	1 6060 0	TCF	SLCAD2

R0086 SLBROUTINE TO DO COUPLING AND 1'S TO 2'S CONVERSION:

0087	REF 867	LAST 1388	10,3645	52 155 1	1TC2SLR CXCH	MPAC
0088			10,3646	20 011 1	DOUUBL	
0089	REF 465	LAST 1384	10,3647	10 000 0	CCS	A
0090	REF 149	LAST 1388	10,3650	6 4753 1	AC	CNE
0091			10,3651	1 3653 0	TCF	+2
0092			10,3652	4 000 0	CCM	
0093	REF 868	LAST 1388	10,3653	54 154 0	TS	MPAC
0094	REF 385	LAST 1386	10,3654	0 0012 0	TC	Q
0095	REF 470	LAST 1386	10,3655	50 000 1	INDEX	A
0096	REF 5	LAST 1094	10,3656	3 4734 0	CAF	LIMITS
0097	REF 869	LAST 1388	10,3657	26 154 0	ACS	MPAC
0098	REF 350	LAST 1388	10,3660	0 0002 0	TC	Q

FINAL MPAC +1 UNSPECIFIED.

THIS WAS REVERSE OF MSU.

AND SKIP ON OVERFLOW.

OVERFLOW UNCORRECT AND IN MSU.

R0114 THE FOLLOWING ROUTINE INCREMENTS IN 2S COMPLEMENT THE REGISTER WHOSE ADDRESS IS IN BLF BY THE 1S COMPL.
 R0116 QUANTITY FOUND IN TEM2. THIS MAY BE USED TO INCREMENT DESIRED INCL AND OPTICS CCU ANGLES OR ANY OTHER 2S COMPL.
 R0118 (+) UNEQUAL TO (-) QUANTITY. MAY BE CALLED BY BANKCALL/SWCALL.

0119	REF 31	LAST 1257	10,3661	54 142 1	CEUINC TS	TEM2
0120	REF 163	LAST 1257	10,3662	50 130 0	INDEX	BLF
0121			10,3663	10 000 0	CCS	0
0122	REF 150	LAST 1388	10,3664	6 4753 1	AC	CNE
0123			10,3665	1 3671 0	TCF	+4
0124	REF 151	LAST 1388	10,3666	6 4753 1	AC	ONE

1S COMPL. QUANT. ARRIVES IN ACC. STORE IT

CHANGE 2S COMPL. ANGLE (IN BLF) INTO 1S

L RTP CR CODES

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0125 REF 152 LAST 1388 10,3667 6 4753 1
 0126 10,3670 4 0011 0

AD ONE
 CCM

OVERFLOW HERE IF 2S CCMPL. IS 180 DEG.

0127 RTE 32 LAST 1388 10,3671 6 0142 0
 0129 REF 471 LAST 1388 10,3672 10 0000 0
 0130 REF 153 LAST 1389 10,3673 6 4753 1
 0131 10,3674 1 3676 1
 0132 10,3675 4 0000 0

AD TEM2
 CCS A
 AD ONE
 TCF +2
 CCM

SULT MOVES FROM 2ND TO 3D QUAD. (OR BACK)
 BACK TO 2S CCMPL.

0133 REF 23 LAST 1389 10,3676 54 142 1
 0134 10,3677 1 3712 1
 0135 REF 472 LAST 1389 10,3700 50 000 1
 0137 REF 6 LAST 1388 10,3701 3 4734 0
 0138 REF 34 LAST 1389 10,3702 6 0142 0

TS TEM2
 TCF +4
 INDEX A
 CAF LIMITS
 AD TEM2

STORE 14BIT QUANTITY WITH PRESENT SIGN

SIGN.
 FIX IT, BY ADDING IN 37777 OR 40000

0139 REF 169 LAST 1388 10,3703 50 130 0
 0140 10,3704 54 000 0
 0141 REF 391 LAST 1388 10,3705 0 0002 0

INDEX PLF
 TS C
 TC Q

STORE NEW ANGLE IN 2S CCMPLEMENT.

L RTE CP CODES

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P0142 RTE TO TORQUE GYROS, EXCEPT FOR THE CALL TO IMSTALL. ECADR OF COMMANDS ARRIVES IN X1.

0144	REF	61	LAST	1211	10,3706	50 120 1	PULSEIM	INDEX	FIXLCC	ADDRESS OF GYRO COMMANDS SHOULD BE IN X1
0145	REF	69	LAST	1261	10,3707	3 0046 0	CA		X1	
0146	REF	211	LAST	1380	10,3710	0 4616 1	TC		BACKCALL	
0147	REF	7	LAST	960	10,3711	17215 0	CADR		IMPLUSE	
0148	REF	63	LAST	1387	10,3712	1 6064 1	TCF		DANZIC	

L RTE OF CODES

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PC192 THE SUBROUTINE SIGNMPAC SETS C(MPAC, MPAC +1) TO SIGN(MPAC).
 RC193 FOR THIS, ONLY THE CONTENTS OF MPAC ARE EXAMINED. ALSO +0 YIELDS PCSMAX AND -0 YIELDS NEGMAX.

RC195 ENTRY MAY BE BY EITHER OF THE FOLLOWING:

RC196 1. LIMIT THE SIZE OF MPAC ON INTERPRETIVE OVERFLOW:
 RC197 ENTRY: BQVP
 RC198 SIGNMPAC

RC199 2. GENERATE IN MPAC THE SIGNUM FUNCTION OF MPAC:
 RC200 ENTRY: RTE
 RC201 SIGNMPC

RC202 IN EITHER CASE, RETURN IS TO THE NEXT INTERPRETIVE INSTRUCTION IN THE CALLING SEQUENCE.

0204				10,3713	0 0005 1	SIGNMPAC	EXTEND		
0205	REF	2	LAST	443	10,3714	3 4733 1	CCA	DPCSMAX	
0206	REF	871	LAST	1388	10,3715	52 155 1	DXCH	MPAC	
0207	REF	473	LAST	1389	10,3716	10 101 0	CCS	A	
0208	REF	271	LAST	1387	10,3717	3 4755 1	DPMODE	CAF	ZERO
0209	REF	4	LAST	1388	10,3720	1 6762 1	TCF	SLCAD2 +2	SETS MPAC +2 TO ZERO IN THE PROCESS
0210				10,3721	1 3722 1	TCF	+1		
0211				10,3722	0 0006 1	EXTEND			
0212	REF	3	LAST	1391	10,3723	4 4733 0	CCS	DPCSMAX	
0213	REF	5	LAST	1391	10,3724	1 6760 0	TCF	SLCAD2	

RC214 RTE OF CODE NORMUNIT IS LIKE INTERPRETIVE INSTRUCTION UNIT, EXCEPT THAT IT CAN BE DEPENDENT ON NOT TO ELW
 RC216 UP WHEN THE VECTOR BEING UNITIZED IS VERY SMALL -- IT WILL BLOW UP WHEN ALL COMPONENTS ARE ZERO. IF NORMUNIT
 RC218 IS USED AND THE UPPER ORDER HALVES OF ALL COMPONENTS ARE ZERO, THE MAGNITUDE RETURNED IN 360 WILL BE TOO LARGE
 RC220 BY A FACTOR OF 2(13) AND THE SQUARED MAGNITUDE RETURNED AT 340 WILL BE TOO BIG BY A FACTOR OF 2(26).

0222	REF	154	LAST	1389	10,3725	3 4753 1	NORMUNIT1	CAF	CNE
02221	REF	11	LAST	905	10,3726	1 3720 1	TCF	NORMUNIT +1	
02222	REF	272	LAST	1391	10,3727	3 4755 1	NORMUNIT	CAF	ZERO
02223	REF	62	LAST	1390	10,3730	6 0120 1	AD	FIXLOC	
02224	REF	871	LAST	1391	10,3731	54 156 1	TS	MPAC +2	
02225	REF	312	LAST	1390	10,3732	0 4616 1	TC	RANKCALL	GET SIGN AGREEMENT IN ALL COMPONENTS
0223	REF	2	LAST	1062	10,3733	01010 1	CADP	VEGAGREE	
0224	REF	872	LAST	1391	10,3734	10 154 0	CCS	MPAC	
0225	REF	1			10,3735	1 3771 1	TCF	NCSHIFT	
0226					10,3736	1 2740 0	TCF	+2	
0227	REF	2	LAST	1391	10,3737	1 3771 1	TCF	NCSHIFT	
0228	REF	873	LAST	1391	10,3740	10 157 0	CCS	MPAC +3	
0229	REF	3	LAST	1391	10,3741	1 3771 1	TCF	NCSHIFT	
0230					10,3742	1 3744 1	TCF	+2	
0231	REF	4	LAST	1391	10,3743	1 3771 1	TCF	NCSHIFT	
0232	REF	874	LAST	1391	10,3744	10 161 0	CCS	MPAC +5	
0233	REF	5	LAST	1391	10,3745	1 3771 1	TCF	NCSHIFT	
0234					10,3746	1 3750 1	TCF	+2	
0235	REF	6	LAST	1391	10,3747	1 3771 1	TCF	NCSHIFT	

L KTR CP CODES

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0236	REF 975	LAST 1391	10,3750	3 0155 0	CA	MPAC	+1	SHIFT ALL COMPONENTS LEFT 13
0237			10,3751	0 0106 1	EXTEND			
0238	REF 79	LAST 1360	10,3752	7 4736 0	MP	RIT14		
0239	REF 876	LAST 1392	10,3753	20 155 1	DAS	MPAC		CAS GAINS A LITTLE ACCURACY
0240	REF 877	LAST 1392	10,3754	3 0160 0	CA	MPAC	+4	
0241			10,3755	0 0206 1	EXTEND			
02411	REF 90	LAST 1392	10,3756	7 4736 0	MP	RIT14		
02412	REF 878	LAST 1392	10,3757	20 160 1	DAS	MPAC	+3	
02413	REF 879	LAST 1392	10,3760	3 0162 1	CA	MPAC	+6	
02414			10,3761	0 0206 1	EXTEND			
02415	REF 81	LAST 1392	10,3762	7 4736 0	MP	RIT14		
02416	REF 880	LAST 1392	10,3763	20 162 0	DAS	MPAC	+5	
02417	REF 2	LAST 1062	10,3764	3 4761 0	CAF	THIRTEEN		
02418	REF 881	LAST 1392	10,3765	50 156 0	INDEX	MPAC	+2	
02419			10,3766	54 045 1	TS	370		
0242	REF 62	LAST 1270	10,3767	0 4635 0	CEFTUNIT	TC	FCSTJUMP	
0243	REF 3	LAST 1005	10,3770	01024 0	CADR	UNIT	+1	SKIP THE "TC VECACREE" ECNE AT UNIT
02431	REF 273	LAST 1391	10,3771	3 4755 1	NCSHIFT	CAF	ZERO	
02432	REF 1		10,3772	1 3765 1	TCF	CEFTUNIT	-2	

R0300 STR VECSEGNAG ...FORCES SIGN AGREEMENT OF VECTOR IN MPAC.

0301	REF 312	LAST 1391	10,3773	0 4616 1	VECSGNAG	TC	RANKCALL
0302	REF 4	LAST 1391	10,3774	01010 1	CADR	VECSGNAG	FEE
0303	REF 64	LAST 1390	10,3775	0 6064 0	TC	DANZIC	

*** END OF SKIPPER .097 ***

L T6-PLT PROGRAMS

LSR'S PAGE NO. 1 EO S4

R0011 PROGRAM NAMES: (1) T6JCBCHK ACC. NO. 5 OCTOBER 2, 1967
 R0012 (2) OCT6PLT

R0013 MODIFICATION BY: LEWELL C HULL (A.C. ELECTRONICS)

R0014 THESE PROGRAMS ENABLE THE LM DAP TO CONTROL THE THRUST TIMES OF THE REACTION CONTROL SYSTEM JETS BY USING TIME6.
 R0015 SINCE THE LM DAP MAINTAINS EXCLUSIVE CONTROL OVER TIME6 AND ITS INTERRUPTS, THE FOLLOWING CONVENTIONS HAVE BEEN
 R0016 ESTABLISHED AND MUST NOT BE TAMPERED WITH:

R0017 1. NO NUMBER IS EVER PLACED INTO TIME6 EXCEPT BY LM DAP.

R0018 2. NO PROGRAM OTHER THAN LM DAP ENABLES THE TIME6 COUNTER.

R0019 3. TO USE TIME6, THE FOLLOWING SEQUENCE IS ALWAYS EXECUTED:

R0020 A. A POSITIVE (NON-ZERO) NUMBER IS STORED IN TIME6.

R0021 B. THE TIME6 CLOCK IS ENABLED.

R0022 C. TIME6 IS INTERROGATED AND IS:

R0023 I. NEVER FOUND NEGATIVE (NON-ZERO) OR +.

R0024 II. SOMETIMES FOUND POSITIVE (BETWEEN 1 AND 2400) INDICATING THAT IT IS ACTIVE.

R0025 III. SOMETIMES FOUND POSMAX INDICATING THAT IT IS INACTIVE AND NOT ENABLED.

R0026 IV. SOMETIMES FOUND NEGATIVE ZERO INDICATING THAT:

R0027 A. A T6PLT IS ABOUT TO OCCUP AT THE NEXT CINC, OR

R0028 B. A T6RPT IS WAITING IN THE PRIORITY CHAIN, OR

R0029 C. A T6RPT IS IN PROCESS NOW.

R0030 4) ALL PROGRAMS WHICH OPERATE IN EITHER INTERRUPT MODE OR WITH INTERRUPT INHIBITED MUST CALL T6JCBCHK
 R0031 EVERY 5 MILLISECONDS TO PROCESS A POSSIBLE WAITING T6RPT BEFORE IT CAN BE HANDLED BY THE HARDWARE.

R0032 (5. PROGRAM JTLST, IN G,R-AXES, HANDLES THE INFLT LIST.)

R0033 T6JCBCHK CALLING SEQUENCE:

ACC32 L TC T6JCBCHK
 A0033 L +1 (RETURN)

R0034 OCT6PLT CALLING SEQUENCE:

A0035 EXCH A RPT T6RPT LEAD IN AT LOCATION 4004.
 A0036 EXTEND
 A0037 ECA T6ADR
 A0038 DTCH

R0039 SUBROUTINES CALLED: OCT6PLT CALLS T6JCBCHK.

R0040 NORMAL EXIT MODES: T6JCBCHK RETURNS TO L +1.
 R0041 OCT6PLT TRANSFERS CONTROL TO RESUME.

R0042 ALARM/ABORT MODES: NONE.

R0043 INPUT: TIME6 NXT6ADR CLTFLT: TIME6 NXT6ADR CHANNEL 5

R0044 T6NEXT T6NEXT +1 T6NEXT T6NEXT +1 CHANNEL 6

R0045 T6FURTHA T6FURTHA +1 T6FURTHA T6FURTHA +1 BIT15/CH12

R0046 DEPRIS: T6JCBCHK CLOBBERS A. OCT6PLT CLOBBERS NOTHING.

L T6-RLPT PROGRAMS

USER'S PAGE NO. 2 PG 54

0055				17,2055			BANK 17		
0056	REF	1		17,2055			SETLCC DAFS2		
0057				17,2055			BANK		
0058	REF	2	LAST 226	16,1466			ERANK= T6NEXT		
0059	REF	3					COUNT# \$\$/DAPT6		
0060	REF	1		17,2055	10,031 1	T6JCBCFK	CCS	TIME6	CHECK TIME6 FOR WAITING T6RLPT:
0061	REF	392	LAST 1389	17,2056	0,0012 0		TC	Q	ACME: CLOCK COUNTING DOWN.
0062	REF	2	LAST 1107	17,2057	0,5675 0		TC	CCSHOLF	
0063	REF	21	LAST 1394	17,2060	0,5675 0		TC	CCSHOLF	
0064	CONTROL		PASSES TO T6JOB ONLY	WHEN C(TIME6) = -0 (I.E. WHEN A T6RLPT MUST BE PROCESSED).					
0069	REF	33	LAST 1120	17,2061	3,4733 1	T6JCP	CA	PCSMAX	
0070				17,2062	22,007 0		ZL		
0071	REF	1		17,2063	53,471 0		LXCH	T6FURTHA	
0072	REF	3	LAST 1394	17,2064	53,467 1		LXCH	T6NEXT	
0073	REF	2	LAST 220	17,2065	22,465 1		LXCH	NXT6ADR	
0074	REF	2	LAST 1394	17,2066	54,031 1		TS	TIME6	
0075	REF	7	LAST 1399	17,2067	6,7730 1		AD	PRIC37	
0076	REF	474	LAST 1391	17,2070	54,000 0		TS	A	
0077	REF	1		17,2071	1,2075 0		TCF	ENARLET6	
0078	REF	34	LAST 1394	17,2072	3,4733 1		CA	PCSMAX	
0079	REF	3	LAST 1394	17,2073	54,031 1		TS	TIME6	
0080	REF	1		17,2074	1,2115 1		TCF	GCCH56	
0081				17,2075	0,0006 1	ENARLET6	EXTEND		
00812	REF	3	LAST 985	17,2076	23,265 1		QXCH	C130SAV	
008125	REF	62	LAST 1367	17,2077	22,570 0		LXCH	RUPTRFG1	
00813	REF	4	LAST 985	17,2100	0,6022 1		TC	C13STALL	
00814				17,2101	0,0006 1		EXTEND		
00815	REF	4	LAST 1394	17,2102	23,265 1		QXCH	C13CSAV	
008155	REF	63	LAST 1394	17,2103	22,070 0		LXCH	RUPTRFG1	
00816	REF	48	LAST 1360	17,2104	3,4735 1		CAF	RIT15	
0082				17,2105	0,0006 1		EXTEND		
0083	REF	22	LAST 1326	17,2106	05,013 0		WCP	CHAN12	
0084	REF	4	LAST 1394	17,2107	3,1466 1		CA	T6NEXT	
0085	REF	8	LAST 1394	17,2110	6,7730 1		AD	PRIC27	
0086	REF	475	LAST 1394	17,2111	54,000 0		TS	A	
0087	REF	2	LAST 1394	17,2112	1,2115 1		TCF	GCCH56	
0088	REF	75	LAST 1394	17,2113	3,4733 1		CA	PCSMAX	
0089	REF	5	LAST 1394	17,2114	55,466 0		TS	T6NEXT	
0090	REF	264	LAST 1388	17,2115	50,001 0	GCCH56	INDEX	L	
0091	REF	1		17,2116	1,5743 0		TCF	WRITEP -1	
0092				5743			BLOCK	02	
0093	REF	1		4,000			SETLCC	FFTAGS	
0094				5743			BANK		
0095	REF	15	LAST 907	16,1435			ERANK= CDLXD		
0096	REF	1					COUNT# \$\$/DAPT6		

L T6-PLCT PROGRAMS

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0097	REF	4	LAST	22	5742	3	1472	1	CA	NEXTP	
0098					5744	0	0006	1	WRITEP	EXTEND	
0099	REF	2	LAST	213	5745	01	0006	0	WRITE	CHAN6	
0100	REF	393	LAST	1394	5746	0	0002	0	TC	Q	
0101	REF	1			5747	3	1473	0	CA	NEXTU	
0102	REF	265	LAST	1394	5750	54	0001	1	WRITEU	TS	
0103	REF	1			5751	4	5764	0	CS	003140CT	
0104					5752	0	0006	1	EXTEND		
0105	REF	2	LAST	1018	5753	02	0005	1	RAND	CHAN5	
0106	REF	266	LAST	1395	5754	6	0001	0	AD	L	
0107					5755	0	0006	1	EXTEND		
0108	REF	4	LAST	1395	5756	01	0005	0	WRITE	CHAN5	
0109	REF	394	LAST	1395	5757	0	0002	0	TC	Q	
0110	REF	1			5760	3	1474	1	CA	NEXTV	
0111	REF	267	LAST	1395	5761	54	0001	1	WRITEV	TS	
0112	REF	2	LAST	1395	5762	3	5764	1	CA	003140CT	
0113					5763	1	5752	0	TCF	-9D	
0114					5764	00314	1	003140CT	0CT	00314	
0115					17,2117				BANK	17	
0116	REF	2	LAST	1394	17,2117				SFTLCC	DAPS2	
0117					17,2117				BANK		
0118	REF	6	LAST	1394	56,1466				EBANK=	T6NEXT	
0119	REF	2	LAST	1394 TC	1394:	34	34*		COUNT*	\$/DAPT6	
0120	REF	11	LAST	1329	17,2117	22	016	0	DCT6PLCT	LXCF	BANKRUPT
0121					17,2120	0	0006	1	EXTEND		
0122	REF	10	LAST	1329	17,2121	22	012	1	GXCF	QRUPT	
0123	REF	1			17,2122	0	2055	0	TC	T6JCRCHK	CALL T6JCRCHK.
0124	REF	25	LAST	1329	17,2123	1	5270	0	TCF	RESUME	END TIME6 INTERRUPT PROCESSOR.

(INTERRUPT LEAD INS CONTINUED)

L DAP INTERFACE SUBROUTINES

USER'S PAGE NO. 1 EO S4

0001 20,2115 BANK 20
0002 REF 3 LAST 43 20,2115 SETLECC DAPS3
0003 20,2115 BANK

0004 REF 16 LAST 1394 56,1635 EBANK= CDUXD
0005 REF 1 CCUNT* \$4/DAPIF

R0006 MOD 0 DATE 11/15/66 BY GEORGE W. CHEPPEY
R0007 MOD 1 1/23/67 MODIFICATION BY PETER ADLER

R0008 FUNCTIONAL DESCRIPTION

R0009 HEREIN ARE A COLLECTION OF SUBROUTINES WHICH ALLOW MISSION CONTROL PROGRAMS TO CONTROL THE MODE
R0011 AND INTERFACE WITH THE DAP.

R0012 CALLING SEQUENCES

R0013 IN INTERRUPT OR WITH INTERRUPT INHIBITED
R0014 TC IEAKCALL
R0015 ECADR ROUTINE

R0016 IN A JOB WITHOUT INTERRUPT INHIBITED
R0017 INHINT
R0018 TC IEAKCALL
R0019 ECADR ROUTINE
R0020 RELINT

R0021 OUTPUT

R0022 SEE INDIVIDUAL ROUTINES BELOW

R0023 COMMENTS

R0024 A, L, AND SOMETIMES MCUTEMP

CDE NOT IN PULSES MODE

L DAP INTERFACE SUBROUTINES

USER'S PAGE NO. 2 F2 S4

R0087 SUBROUTINE NAMES:
R0088 SETMAXDB, SETMINDB, RESTCRDB, PELITEED

R0089 MODIFIED: 31 JANUARY 1968 BY P S WEISSMAN TO CREATE RESTCRDB.

R0090 MODIFIED: 1 MARCH 1968 BY P S WEISSMAN TO SAVE FBANK AND CREATE PELITEDB

R0091 FUNCTIONAL DESCRIPTION:

R0092 SETMAXDB - SET DEADBAND TO 5.0 DEGREES

R0093 SETMINDB - SET DEADBAND TO 0.3 DEGREE

R0094 RESTCRDB - SET DEADBAND TO .3, 1, OR 5 ACCORDING TO BITS 4 AND 5 OF DAPBCOLS

R0096 PELITEED - SET DEADBAND TO 1.0 DEGREE AND ZERO THE COMMANDED ATTITUDE CHANGE AND COMMANDED RATE

R0098 ALL ENTRIES SET UP A NCVAC JOB TO DO 1/ACCS SO THAT THE TJETLAW SWITCH CURVES ARE POSITIONED TO

R0100 REFLECT THE NEW DEADBAND. IT SHOULD BE NOTED THAT THE DEADBAND REFERS TO THE ATTITUDE IN THE F-, L-, AND V-AXES.

R0102 SUBROUTINE CALLED: NCVAC

R0103 CALLING SEQUENCE: SAME AS ABOVE

R0104 A0104 OR TO RESTCRDB +1 FROM ALLOCAT
R0105 DEBRIS: A, L, C, PULPTREG1, (ITEMS IN NCVAC)

0106	REF	31	LAST	903	20,2116	30 111 0	RESTCRDB	CAF	DAPBCOLS	DETERMINE CREW-SELECTED DEADBAND.
01061	REF	1			20,2116	7 4747 0		MASK	DBSELECT2	CHECK FOR MAX DB (5 DEG)
01062					20,2117	3 0006 1		EXTEND		
01063					20,2120	1 2122 0		RZF	+2	
01064	REF	1			20,2121	1 2130 0		TCF	SETMAXDB	BITS DAPBCOLS IS SET - CREW WANTS 5 DEG
01065	REF	32	LAST	1397	20,2122	30 111 0		CAF	DAPBCOLS	
0107	REF	1			20,2123	7 4750 0		MASK	DBSELECT	CHECK FOR 1 DEG DEADBAND SELECTION
0108					20,2124	0 0006 1		EXTEND		
0109	REF	6	LAST	847	20,2125	1 2141 0		RZF	SETMINDB	
01091	REF	1			20,2126	3 2153 1		CAF	POWERPDB	BIT4 DAPBCOLS IS SET - CREW WANTS 1 DEG
01092	REF	2	LAST	1397	20,2127	1 2131 1		TCF	SETMAXDB +1	
0110	REF	1			20,2130	3 2152 1	SETMAXDB	CAF	WIDECB	SET 5 DEGREE DEADBAND.
0111	REF	4	LAST	825	20,2131	55 1343 0	+1	TS	DB	
0112					20,2132	0 0046 1		EXTEND		SET UP JOB TO RE-POSITION SWITCH CURVES.
0113	REF	64	LAST	1394	20,2133	22 070 0		QXCH	PULPTREG1	
0114	REF	4	LAST	736	20,2134	3 7720 0	CALLACCS	CAF	PRIC27	
0115	REF	31	LAST	1361	20,2135	0 5072 1		TC	NCVAC	
0116	REF	9	LAST	732	20,2136	0 0000 1		EBANK=	40SQ	
0117	REF	2	LAST	153	20,2136	03644 1		2CACR	1/ACCSJOB	
0117					20,2137	42106 0				
0118	REF	65	LAST	1397	20,2140	0 0017 0		TC	PULPTREG1	RETURN TO CALLER.
0119	REF	1			20,2141	3 2151 0	SETMINDB	CAF	APPROXDB	SET 0.3 DEGREE DEADBAND.
0120	REF	3	LAST	1397	20,2142	1 2131 1		TCF	SETMAXDB +1	

L DAP INTERFACE SUBROUTINES

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0121				20,2142	0 0056 1	PELITEDE	EXTEND		
0122	REF	66	LAST 1397	20,2144	22 0170 0		QXCH	RUPTREG1	
0123	REF	9	LAST 847	20,2145	0 2154 0		TC	ZATTEROR	
0124	REF	2	LAST 1397	20,2146	3 2153 1		CAF	POWERDB	
0125	REF	5	LAST 1397	20,2147	55 1343 0		TS	DB	
0126	REF	1		20,2150	1 2134 1		TCF	CALLACCS	
01261				20,2151	00155 0	NARROWDB	CTAL	00155	
01262				20,2152	03434 1	WIDEBE	CTAL	03434	
0127				20,2153	00554 0	POWERDB	DFC	02222	
0128	REF	8	LAST 896	20,2154	3 5015 0	ZATTEROR	CAF	FRANK6	
0129	REF	83	LAST 1384	20,2155	56 003 1		XCH	FRANK	
0130	REF	268	LAST 1395	20,2156	54 0 1 1		TS	L	
0131	REF	21	LAST 1303	20,2157	30 032 0		CAF	CDUX	
0132	REF	17	LAST 1396	20,2160	55 1635 1		TS	CDUXC	
0133	REF	10	LAST 1299	20,2161	20 033 1		CAF	CDUY	
0134	REF	4	LAST 904	20,2162	55 1636 1		TS	CDUYC	
0135	REF	13	LAST 1299	20,2163	20 034 0		CAF	CDLZ	
0136	REF	4	LAST 904	20,2164	55 1637 0		TS	CDUZD	
0137	REF	9	LAST 917	20,2165	1 2171 0		TCF	STOPRATE +3	
0138	REF	0	LAST 1398	20,2166	3 5 15 0	STOPRATE	CAF	FRANK6	
0139	REF	84	LAST 1398	20,2167	56 003 1		XCH	FRANK	
0140	REF	269	LAST 1398	20,2170	54 001 1		TS	L	
0141	REF	274	LAST 1392	20,2171	3 4755 1	+3	CAF	ZERO	
0142	REF	11	LAST 911	20,2172	55 1643 0		TS	OMEGAFD	
0143	REF	6	LAST 910	20,2173	55 1644 1		TS	OMEGAGD	
0144	REF	6	LAST 910	20,2174	55 1645 0		TS	OMEGARD	
0145	REF	6	LAST 911	20,2175	55 1640 0		TS	DELCDLX	
0146	REF	2	LAST 137	20,2176	55 1641 1		TS	DELCDLY	
0147	REF	2	LAST 137	20,2177	55 1642 1		TS	DELCDUZ	
0148	REF	4	LAST 911	20,2200	55 1274 0		TS	DELPEROR	
0149	REF	2	LAST 370	20,2201	55 1275 1		TS	DELQFRR	
0150	REF	2	LAST 370	20,2202	55 1276 1		TS	DELRROR	
0151	REF	85	LAST 1398	20,2203	22 003 1		LXCH	FRANK	
0152	REF	395	LAST 1395	20,2204	0 0202 0		TC	Q	

THE RETURN FROM CALLACCS IS TO RUPTREG1.

ZERO THE ERRORS AND COMMANDED RATES.
SET OF TC 1.0 DEG.SET UP 1/ACCS AND RETURN TO CALLEP.
0.3 DEGREE SCALED AT 45.
5.0 DEGREES SCALED AT 45.
1.0 DEGREE SCALED AT 45.

SAVE CALLERS FRANK IN L.

SAVE CALLERS FRANK IN L.

RESTORE CALLERS FRANK.

R0153 SUBROUTINE NAME: ALLOCST

R0154 WILL BE CALLED BY FRESH STARTS AND ENGINE OFF ROUTINES.

R0155 CALLING SEQUENCE: (SAME AS ABOVE)

R0157 EXIT: RETURN TO G.

R0158 SUBROUTINES CALLED: STOPRATE, RESTORCE, ACVAC

R0159 ZERO: (FOR ALL AXES) ACS, ALPHA, ACSTERM, OMEGAD, DELCDU, DELEROR

L DAP INTERFACE SUBROUTINES

USER'S PAGE NO. 4 E6 S4

R0160 OUTPL1: DRIPTBIT/DAPBCCLS, DE, JCB TO DO 1/ACCS

R0161 DEPRIS: A, L, Q, RUPTREG1, PLPTREG2, (ITEMPS IN ACVAC)

0162				20,2205	4 0106 1	ALLOCAST	EXTEND		SAVE G FOR RETURN
0163	REF	23	LAST	1320	20,2206	22 071 1	GXCF	RUPTREG2	
0164	REF	10	LAST	1398	20,2207	1 2166 1	TC	STOPRATE	CLEAR RATE INTERFACE. RETURN WITH A=C
0165	REF	86	LAST	1398	20,2210	22 003 1	LXCF	EBANK	AND L=EBANK6. SAVE CALLERS EBANK.
0166	REF	10	LAST	1397	20,2211	55'537 0	TS	ACSC	
0167	REF	11	LAST	1399	20,2212	55'540 0	TS	ACSC +1	
0168	REF	2	LAST	732	20,2213	55'541 1	TS	ACSR	
0169	REF	3	LAST	1399	20,2214	55'542 1	TS	ACSR +1	
0170	REF	2	LAST	196	20,2215	55'5424 0	TS	ALPHAQ	FOR DOWNLIST.
0171	REF	1			20,2216	55'5425 1	TS	ALPHAQ	
0172	REF	2	LAST	134	20,2217	55'545 0	TS	ACSCTERM	
0173	REF	1			20,2220	55'546 0	TS	ACSCTERM	
0174	REF	87	LAST	1399	20,2221	22 003 1	LXCF	EBANK	RESTORE EBANK (EBANK6 NO LONGER NEEDED)
0175	REF	33	LAST	1397	20,2222	4 0111 1	CS	DAPBCCLS	SET UP DRIPTBIT
0176	REF	2	LAST	732	20,2223	7 4744 0	MASK	DRIPTBIT	
0177	REF	34	LAST	1399	20,2224	26 111 1	ADS	DAPBCCLS	
0178	REF	8	LAST	847	20,2225	1 2116 0	TC	RESTOR6 +1	RESTORE DEADBANK TO CREW-SELECTED VALUE.
0179	REF	24	LAST	1399	20,2226	0 0171 1	TC	RUPTREG2	RETURN.

L DAPICLER PROGRAM

LSFR'S PAGE NO. 1 ED S4

R0001 THE DAPICLER PROGRAM IS STARTED BY FRESH START AND RESTART. THE DAPICLER PROGRAM IS DONE 10 TIMES
 R0003 PER SECOND UNTIL THE ASTRONAUT DESIRES THE DAP TO WAKE UP, AND THE IMU AND CDS ARE READY FOR USE BY THE DAP.
 R0005 THE NECESSARY INITIALIZATION OF THE DAP IS DONE BY THE DAPICLER PROGRAM.

0006 BANK 16
 0007 REF 1 16,2000 SETLCC DAPS1
 0008 BANK 16,2000

0009 REF 12 LAST 1395 16,1537 FBANK= ACSC

0010 REF 1 COUNT# \$\$/DAPIO

0011 16,2000 2 0006 1 CHEKEITS EXTEND
 0012 REF 8 LAST 904 16,2001 00 031 0 READ CHAN31
 0013 16,2002 4 0000 0 CCM
 0014 REF 6 LAST 495 16,2003 7 4355 1 MASK BIT13-14
 0015 16,2004 0 1006 1 EXTEND
 0016 REF 1 16,2005 1 2157 1 RZF MOREICLE

IF BOTH BIT13 AND BIT14 ARE ONE, THEN
 THE MODE SELECT SWITCH IS IN THE CFF
 POSITION, AND SO THE DAP SHOULD BE OFF,
 WITH AN ATTITUDE ERROR DISPLAY.

0017 REF 48 LAST 1307 16,2006 4 1300 1 CS IMODES33
 0018 REF 62 LAST 1391 16,2007 7 4746 1 MASK BIT6
 0019 REF 476 LAST 1394 16,2008 10 000 0 CCS A
 0020 REF 1 16,2011 1 2206 0 TCF JLMPOSP
 0021 REF 4 LAST 224 16,2012 4 1262 1 CS PCSFLAGS
 0022 REF 39 LAST 1386 16,2013 7 4751 1 MASK BIT3
 0023 REF 5 LAST 1400 16,2014 27 262 1 ADS PCSFLAGS
 0024 REF 1 16,2015 1 2163 0 TCF SHUTECWN

IMU NOT USABLE. SET UP INITIALIZATION
 FLAG FOR ATT ERROR DISPLAY ROUTINE.

0025 REF 59 LAST 1325 16,2016 3 4742 1 CHEKMORE CAP BIT1
 0026 16,2017 0 0006 1 EXTEND
 0027 REF 9 LAST 504 16,2020 02 031 0 RAN3 CHAN31
 0028 REF 477 LAST 1400 16,2021 10 000 0 CCS A
 0029 REF 2 LAST 1400 16,2022 1 2157 1 TCF MOREICLE

BIT 17 OF 30 IS PGNS CONTROL OF S/C

BITS IN 30 ARE INVERTED

0030 16,2023 0 0002 0 RETURN

L DAFIDLER PROGRAM

LSFF'S PAGE NO. 2 E6 S4

P0031 DAFIDLER ENTRY.

0032	REF	12	LAST 1395	16,2024	22 016 0	DAPIDLER	LXCH	BANKLEFT	INTERRUPT LEAD INS (CONTINUED)
0033				16,2025	1 0116 1		EXTEND		
0034	REF	11	LAST 1395	16,2026	22 012 1		GXCH	GRUPT	
0035	REF	6	LAST 1400	16,2027	3 1262 0		CA	RCSFLAGS	
0036	REF	50	LAST 1356	16,2030	7 4737 1		MASK	BIT13	
0037	REF	478	LAST 1400	16,2031	10 000 0		DCS	A	CHECK IF 1/ACCSQ HAS BEEN SET UP SINCE THE LAST FRESH START OR RESTART.
0038	REF	1		16,2032	1 2041 1		TCF	CHTCKUP	
00381	REF	51	LAST 1401	16,2033	3 4737 0		CA	BIT13	
00382	REF	7	LAST 1401	16,2034	27 262 1		ADS	RCSFLAGS	BIT 13 IS 1.
00383	REF	5	LAST 1397	16,2035	3 7720 0		CAF	PRI027	
0039	REF	32	LAST 1397	16,2036	0 5072 1		TC	ACVAC	SET UP JOB TO DO A LITTLE INITIALIZATION AND EXECUTE 1/ACCS.
0040	REF	13	LAST 1400	16,1537			FBANK=	ADSQ	(WILL BRANCH TO MCREIDLE ON ACCSCKAY)
0041	REF	1		16,2037	03637 0		2CAGR	1/ACCSSET	
0041	REF	1		16,2040	42116 0				
0042	REF	1		16,2041	0 2000 0	CHECKUP	TC	CHEKBITS	CHECK TC SEE IF LM DAF IS TO GO ON AND DO ERROR DISPLAY.
A0043									
0044	REF	35	LAST 1395	16,2042	30 111 0		CAF	DAPROCLS	IF 1/ACCS HAS NOT BEEN COMPLETED, IDLE.
0045	REF	2	LAST 2200	16,2043	7 4751 1		MASK	ACCSCKAY	NOTE: ONLY FRESH START AND RESTART KNOCK THIS BIT DOWN.
0046				16,2044	0 0006 1		EXTEND		
0047	REF	3	LAST 1400	16,2045	1 2157 1		BZF	MCREIDLE	
0048	REF	51	LAST 1308	16,2046	0 4674 0	STARTCAP	TC	1BANKCALL	ZERO ATTITUDE ERROR AND DESIRED RATES.
0049	REF	10	LAST 1398	16,2047	40154 0		FCADR	ZATTFRCH	
0050	REF	276	LAST 1398	16,2050	3 4755 1		CAF	ZERO	***** INITIALIZE: *****
0051	REF	3	LAST 134	16,2051	551524 1		TS	TJF	
0052	REF	2	LAST 135	16,2052	551525 0		TS	TJL	
0053	REF	1		16,2053	551526 0		TS	TJV	
0054	REF	7	LAST 196	16,2054	551421 0		TS	OMEGAP	RATES IN BODY (PILOT) COORDINATES.
0055	REF	6	LAST 754	16,2055	551422 0		TS	OMEGAG	
0056	REF	1		16,2056	551423 1		TS	OMEGAR	
0057	REF	6	LAST 131	16,2057	551430 0		TS	TRAPEDF	
0058	REF	1		16,2060	551431 1		TS	TRAPEDQ	
0059	REF	1		16,2061	551432 1		TS	TRAPEDR	
0060	REF	14	LAST 1401	16,2062	551527 0		TS	ADSQ	OFFSET ACCELERATION ESTIMATES.
0061	REF	15	LAST 1401	16,2063	551540 0		TS	ADSQ +1	
0062	REF	4	LAST 1395	16,2064	551541 1		TS	ACSR	
0063	REF	5	LAST 1401	16,2065	551542 1		TS	ACSR +1	
0064	REF	3	LAST 1395	16,2066	551424 0		TS	ALPHAQ	COPIES OF OFFSET ESTIMATES FOR DOWNLIST.
0065	REF	2	LAST 1395	16,2067	551425 1		TS	ALPHAR	
0066	REF	2	LAST 135	16,2070	551501 0		TS	NEGUG	
0067	REF	1		16,2071	551503 1		TS	NEGUR	
0068	REF	3	LAST 1395	16,2072	551545 0		TS	ADSQTERM	GRAXIS RATE DERIVATION TERMS AND KALMAN
0069	REF	2	LAST 1399	16,2073	551546 0		TS	ADSRTERM	FILTER INITIALIZATION TERMS.
0070	REF	1		16,2074	551510 0		TS	QACCDOT	DESCENT ACCELERATION DERIVATIVE EST.
0071	REF	1		16,2075	551512 1		TS	RACCDOT	

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0072	REF	1		16,2076	55'502 0	TS	ALICWCTS	ADSTASK FLAG FOR GRAXIS RCS CONTROL USE.
0073	REF	1		16,2077	55'621 0	TS	CCTRCLE	CC TRYCTS ON FIRST PASS (WILL CC TO RCS)
0074	REF	1		16,2100	55'633 1	TS	INGTS	RECOGNIZE FIRST GTS PASS AS SUCH.
0075	REF	3	LAST 135	16,2100	55'622 0	TS	GGIMTMR	STOP GIMFAL CRIVES. (PROBABLY WOULD BE
0076	REF	1		16,2102	55'634 0	TS	RGIMTMR	GOOD ENOUGH JUST TO INACTIVATE TIMERS)
0077	REF	1		16,2103	55'460 0	TS	CLCPMIN	MINIMUM IMPULSE MODE ERASABLES
0078	REF	1		16,2104	55'461 1	TS	CLDGRMIN	
00781	REF	3	LAST 138	16,2105	55'767 1	TS	PJETCTR	INITIALIZE DOCKED JET INHIBITION
00782	REF	1		16,2106	55'770 1	TS	UJETCTR	COUNTERS
00783	REF	2	LAST 138	16,2107	55'771 0	TS	VJETCTR	
0079	REF	49	LAST 137	4747		CALLCMBL	EQUALS BITS	RCSFLAGS INITIALIZATION.
0080	REF	1		16,2110	4 2202 1	CS	MANFLAG	
0081	REF	3	LAST 1401	16,2111	7 1262 1	MASK	RCSFLAGS	NECLOG(R) HAVE BEEN GENERATED.
0082	REF	9	LAST 1402	16,2112	55'262 1	TS	RCSFLAGS	

R0083 SET UP "CLD" MEASURED CCL ANGLES:

0084				16,2113	3 0006 1	EXTEND		
0085	REF	22	LAST 1358	16,2114	3 0033 1	CCA	CCLX	CLDXFCRP AND CLDYFCRP
0086	REF	3	LAST 131	16,2115	52'441 0	DXCH	CLDXFCRP	
0087	REF	14	LAST 1398	16,2116	3 0034 0	CA	CDUZ	
0088	REF	1		16,2117	55'442 0	TS	CLDZFCRC	
0089	REF	10	LAST 1402	16,2120	4 1262 1	CS	RCSFLAGS	
0090	REF	26	LAST 1357	16,2121	7 4740 1	MASK	BIT12	BIT 12 SET TO 1.
00901	REF	11	LAST 1402	16,2122	27'262 1	ADS	RCSFLAGS	
0091	REF	31	LAST 1354	16,2123	3 4751 0	CA	FOUR	
0092	REF	2	LAST 134	16,2124	55'535 1	TS	SKIPL	
0093	REF	1		16,2125	55'536 1	TS	SKIPV	
0094	REF	26	LAST 1394	16,2126	3 4733 1	CA	POS MAX	
0095	REF	4	LAST 1294	16,2127	54 031 1	TS	TIME6	
0096	REF	7	LAST 1395	16,2130	55'466 0	TS	T6NEXT	
0097	REF	2	LAST 1294	16,2131	55'470 1	TS	T6FURTHA	
0098	REF	276	LAST 1401	16,2132	3 4755 1	CA	ZERO	
0099	REF	8	LAST 1402	16,2133	55'467 1	TS	T6NEXT +1	
0100	REF	3	LAST 1402	16,2134	55'471 0	TS	T6FURTHA +1	
0101	REF	3	LAST 1394	16,2135	55'465 0	TS	NXT6ADR	
0102	REF	5	LAST 1395	16,2136	55'472 0	TS	NEXTP	
0103	REF	2	LAST 1395	16,2137	55'473 1	TS	NEXTU	
0104	REF	2	LAST 1395	16,2140	55'474 0	TS	NEXTV	
0105	REF	8	LAST 1030	16,2141	4 4363 1	CS	TEN	
0106	REF	1		16,2142	55'757 1	TS	DAFZRLPT	JASK ACT IN PROGRESS, INITIALIZE NEC.
0107	REF	93	LAST 1381	16,2143	3 4752 0	CA	TWO	
0108	REF	1		16,2144	55'433 0	TS	NFTRAPS	
0109	REF	1		16,2145	55'434 1	TS	NQTRAPS	
0110	REF	1		16,2146	55'435 0	TS	NRTRAPS	
0111				16,2147	0 0006 1	EXTEND		
0112	REF	1		16,2150	3 2205 1	CCA	PAXADIDL	
0113	REF	3	LAST 220	16,2151	52'264 1	DXCH	T5ADR	
0114	REF	1		16,2152	3 7732 0	CAF	MS100	
0115	REF	4	LAST 853	16,2153	54 0030 0	TS	TIME5	

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0116	REF	26	LAST 1395	16,2154	1 5270 0	TCF	RESUME	
0117	REF	16	LAST 1401	16,2157		EBANK=	ACSQ	
0118	REF	2	LAST 222	16,2155	02024 0	ICLERADR	2CADR	DAPIELER
0118				16,2156	341 6 1			
0119	REF	52	LAST 1401	16,2157	0 4674 0	MOREICL	TC	IBNKCALL
0120	REF	1		16,2160	36655 1	CADR	QEPRCALC	CALCULATE Q,R-AXES ATTITUDE ERRORS.
0121	REF	53	LAST 1403	16,2161	0 4674 0	TC	IBNKCALL	
0122	REF	1		16,2162	35452 1	CADR	CALCPERR	CALCULATE P AXIS ATTITUDE ERRORS.
0123				16,2163	0 0006 1	SHUTDWN	EXTEND	
0124	REF	1		16,2164	3 2156 1	ECA	ICLERADR	
0125	REF	4	LAST 1402	16,2165	52'264 1	EXCH	T5ADR	
0126	REF	277	LAST 1402	16,2166	3 4755 1	CAP	ZERO	KILL ANY POSSIBLE JET REQUESTS
0127	REF	6	LAST 1402	16,2167	55'472 0	TS	NEXTP	
0128	REF	3	LAST 1402	16,2170	55'473 1	TS	NEXTL	
0129	REF	3	LAST 1402	16,2171	55'474 0	TS	NEXTV	
0130				16,2172	0 0006 1	EXTEND		COMMAND JETS OFF.
0131	REF	5	LAST 1395	16,2173	01 0006 1	WRITE	CHAN5	
0132				16,2174	0 0006 1	EXTEND		
0133	REF	3	LAST 1395	16,2175	01 0006 0	WRITE	CHAN6	
0134	REF	1		16,2176	4 2202 0	CS	BGIM23	TURN TRIM GIMBAL OFF
0135				16,2177	0 0006 1	EXTEND		
0136	REF	65	LAST 1314	16,2200	03 0012 1	WAND	CHAN12	
0137	REF	1		16,2201	1 2152 1	TCF	SFTTIME5	RETURN IN 100 MSEC.
01371				16,2202	03021 1	MANFLAC	CCT	02021
0138				16,2203	07400 1	BGIM23	CCTAL	07400
0139	REF	8	LAST 1401	16,2204	02213 0	ERANK=	DMFGAP	
0140	REF	1		16,2204	02213 0	PAXADICL	2CADR	PAXIS
0140	REF	1		16,2205	34106 1			
0141	REF	2	LAST 156	7732		MS100	=	0CT37766
0142	REF	69	LAST 1373	0061		COSMG	=	ITFMF1
01431				16,2206	0 0006 1	JLMPDSP	EXTEND	TRANSFER TO BANK 20
01432	REF	1		16,2207	3 2212 1	ECA	DSPCADR	FOR ATTITUDE ERROR DISPLAYS
01433				16,2210	52 006 0	CTCR		
01434	REF	3	LAST 138	16,2211	02227 1	DSPCADR	2CADR	ALTDSPFLY
01435	REF	1		16,2212	40116 1			

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01436 20,2227 BANK 20
 01437 PFF 4 LAST 1396 20,2227 SFTLCC DAPS3
 01438 20,2227 BANK
 01439 PFF 1 COUNT# 14/NEEDL

R0144 PROGRAM: ALTOSPLY

R0145 MOD C. 6 DEC 1967

R0146 AUTHOR: CRAIG WOLF, DON KEENE, MIT IL

R0147 MOD 3 BY DON KEENE AUG 1, 1968 MOVED PROGRAM TO BANK 20

R0148 PROGRAM DESCRIPTION:

R0149 ALTOSPLY REVERSES THE DSPLYALT BIT OF RCSFLAGS EACH TIME IT IS CALLED, WHICH IS PRESUMABLY EVERY 100 MS.
 R0151 IF THE REVERSED BIT IS ONE, NEEDLER IS CALLED TO DISPLAY ATTITUDE ERRORS. IF THE BIT IS ZERO, THE ATTITUDE ERR-
 R0153 OPS ARE CALCULATED AS 1) ESTIMATED RATES (FOLLOWING) IF NEED2FLG = 1, OTHERWISE AS 2) CAP FOLLOWING ERRORS FOR
 R01541 NEEDFLG = 1 AND 3) TOTAL ATTITUDE ERRORS FOR NEEDFLG = 1.

R0155 WARNING: ALTOSPLY MAY ONLY BE CALLED WITH INTERRUPT INHIBITED.

R0156 WARNING: FBANK MUST BE SET TO 6 WHEN USING THIS ROUTINE.

R0157 INPUT: RCSFLAGS AND 1) IF NEEDFLG=0, INPUT PERROR, QERROR, RERROR.

R0158 2) IF NEEDFLG=1, INPUT CPH1, CTHETA, CPS1, CCUX, CCUY, CCUZ, M11, M21, M31, M22, M32. (GPMATRIX)

R01591 3) IF NEED2FLG = 1, INPUT OMEGA, CMEGAQ, AND OMEGAR.

R0160 OUTPUTS: RCSFLAGS WITH DSPLYALT REVERSED, AK, AK1, AK2, + NEEDLER OUTPUTS.

R0161 ENTRY: TCF ALTOSPLY

R0162 EXIT: TCF CHECKMOD

R0163 ALARM OR ABORT EXITS: ACME

R0164 SUBPROGRAMS CALLED: NEEDLER, OVERSUR2

R0165 DEPRIS: A, L, AND NEEDLER DEPRIS.

0166	REF 12	LAST 1402	20,2227	3 1262 0	ALTOSPLY CA	RCSFLAGS	INVERT THE DISPLAY ALTERNATION BIT.
0167	PFF 270	LAST 1398	20,2230	54 001 1	TS	L	
0168	PFF 1		20,2231	3 4750 1	CA	DSPLYALT	
0169			20,2232	0 0006 1	EXTEND		
0170	REF 18	LAST 1381	20,2233	06 001 0	EXCR	LCHAN	
0171	REF 12	LAST 1404	20,2234	55 262 1	TS	RCSFLAGS	
0172	REF 2	LAST 1404	20,2235	7 4750 0	MASK	DSPLYALT	
0173	REF 479	LAST 1401	20,2236	10 000 0	CPS	A	IS ALTERNATION FLAG ZERO?

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0174	PEF	1		20,2237	1 2336 1	TCF	NEEDLER	
01741	PEF	31	LAST 1366	20,2240	4 0074 0	CS	FLAGWRD	CHECK FOR RATE DISPLAY TO ERROR NEEDLES
01742	PEF	1		20,2241	7 4735 0	MASK	NEED2BIT	VIA EXTENDED VERB 60
01743				20,2242	0 0006 1	EXTEND		
01744	PEF	1		20,2243	1 2257 1	EZF	DISPRATE	
0175	PEF	32	LAST 1405	20,2244	30 074 1	CAF	FLAGWRD	NEEDLER WILL INDICATE TOTAL OR CAP ATTITUDE ERROR DISPLAY REQUEST.
0176	PEF	1		20,2245	7 4750 0	MASK	NEEDLEBIT	
0177	PEF	480	LAST 1404	20,2246	10 0000 0	CCS	A	
0178	PEF	1		20,2247	1 2266 0	TCF	DISPLYTOT	TOTAL ERROR IS NEEDED IN AK, AK +1, AK +2
0179	PEF	2	LAST 132	20,2250	4 1450 0	CS	DEPROR	YES. DISPLAY ATT ERRORS ON THE -BALL.
0180	PEF	4	LAST 1403	20,2251	55 762 1	TS	AK +1	ERROR COMPLEMENTS ARE INPUT TO NEEDLER.
0181	PEF	2	LAST 132	20,2252	4 1452 1	CS	REFROR	
01815	PEF	5	LAST 1405	20,2253	55 763 0	TS	AK +2	
0182	PEF	2	LAST 155	20,2254	4 1464 1	CS	PERROR	
0183	PEF	6	LAST 1415	20,2255	57 761 0	XCH	AK	
0184	PEF	1		20,2256	1 2456 0	TCF	RETNMORE	DISPLAY THESE THE NEXT TIME THROUGH
01841	PEF	7	LAST 1401	20,2257	4 1422 0	DISPRATE	CS	OMEGAQ
01842	PEF	7	LAST 1405	20,2260	55 762 1	TS	AK +1	LOAD ESTIMATED RATES (FOLLOWING)
01843	PEF	2	LAST 1401	20,2261	4 1422 1	CS	OMEGAR	
01844	PEF	8	LAST 1405	20,2262	55 763 0	TS	AK +2	
01845	PEF	9	LAST 1403	20,2263	4 1421 0	CS	OMEGAP	
01846	PEF	9	LAST 1405	20,2264	57 761 0	XCH	AK	
01847	PEF	2	LAST 1415	20,2265	1 2456 0	TCF	RETNMORE	
0185	CALCULATE GIMBAL ANGLE TOTAL ERRORS, RESOLVE INTO PILOT AXES, STORE TOTAL ERRORS FOR NEEDLER. G-AXIS FIRST.							
0187				20,2266	0 0006 1	DISPLYTOT	EXTEND	
0188	PEF	70	LAST 1403	20,2267	22 061 0	XCH	ITEMP1	SAVE G FOR CHECKS RETURN.
0189	PEF	3	LAST 480	20,2270	3 0322 1	CA	CTHETA	DESIRED ATTITUDE, Y-AXIS, 2'S COMP.
0190				20,2271	0 0006 1	EXTEND		SUBTRACT CURRENT ATTITUDE.
0191	PEF	11	LAST 1398	20,2272	20 032 0	MSU	CDLY	DIFFERENCE SCALED AT P1, 1'S COMP.
0192	PEF	10	LAST 1405	20,2273	55 761 1	TS	AK	SAVE FOR R-ERROR CALCULATION.
0193				20,2274	0 0006 1	EXTEND		
0194	PEF	2	LAST 190	20,2275	7 1415 1	MP	M21	(CTHETA-CDLY)*M21 SCALED AT P1 RADIANS.
0195	PEF	11	LAST 1405	20,2276	57 762 0	XCH	AK +1	STORE FIRST TERM OF Q ERROR.
0196	PEF	5	LAST 521	20,2277	3 0323 0	CA	CPFI	DESIRED ATTITUDE, Z-AXIS, 2'S COMP.
0197				20,2300	0 0006 1	EXTEND		SUBTRACT CURRENT ATTITUDE.
0198	PEF	15	LAST 1402	20,2301	20 034 1	MSU	CDUZ	DIFFERENCE SCALED AT P1, 1'S COMP.
0199	PEF	12	LAST 1405	20,2302	55 763 0	TS	AK +2	SAVE Z-AXIS TERM FOR R ERROR CALCULATION
0200				20,2303	0 0006 1	EXTEND		
0201	PEF	5	LAST 896	20,2304	7 1417 0	MP	M22	(CPFI-CDUZ)*M22, SCALED AT P1 RADIANS.
0202	PEF	13	LAST 1405	20,2305	6 1762 0	AD	AK +1	G ERROR COMPLETE , AT P1 RAD.
0203	PEF	1		20,2306	0 2451 0	TC	OVERSUB2	PIN NEEDLES IN CASE OF OVERFLOW.
0204	PEF	14	LAST 1405	20,2307	55 762 1	TS	AK +1	

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RC205 R ERROR CALCULATION NEXT.

0206	REF	15	LAST	1405	20,2310	3 1761 0	CA	AK	Y-AXIS DIFFERENCE STORED BY Q-AXIS CALC.
0207					20,2311	0 0006 1	EXTEND		
0208	REF	2	LAST	190	20,2312	7 1416 1	MP	M31	(CTHETA-CDUY)*M31, SCALED AT PI RADIANS.
0209	REF	16	LAST	1406	20,2313	57 1763 1	XCH	AK +2	FIRST TERM OF R ERROR.
A0210									Z-AXIS DIFFERENCE, STORED BY A CALC. IS
0211					20,2314	0 0006 1	EXTEND		RECOVERED BY THE EXCHANGE.
0212	REF	3	LAST	896	20,2315	7 1420 1	MP	M32	(CPSI-CDLZ)*M32, SCALED AT PI RADIANS.
0213	REF	17	LAST	1406	20,2316	6 1763 1	AC	AK +2	P ERROR COMPLETE, AT PI RAD.
0214	REF	2	LAST	1405	20,2317	0 2451 0	TC	OVERSLB2	FIN NEEDLES IN CASE OF CVERFLOW.
0215	REF	18	LAST	1406	20,2320	55 1763 0	TS	AK +2	

R0216 NOW CALCULATE R ERROR. (NOTE THAT M13 = 1, SCALED AT 1, SO THE MULTIPLICATION IS BY-PASSED.)

0218	REF	19	LAST	1406	20,2321	3 1761 0	CA	AK	Y-AXIS DIFFERENCE STORED BY Q AXIS CALC.
0219					20,2322	0 0006 1	EXTEND		
0220	REF	7	LAST	189	20,2323	7 1414 0	MR	M11	(CTHETA-CDUY)*M11 SCALED AT PI RADIANS.
0221	REF	20	LAST	1406	20,2324	57 1761 0	XCH	AK	FIRST TERM OF P ERROR IN AK, AT PI RAD.
0222	REF	11	LAST	907	20,2325	3 0021 1	CAF	CPH1	DESIRED ATTITUDE, X-AXIS, 2'S COMR.
0223					20,2326	0 0006 1	EXTEND		SUBTRACT CURRENT X ATTITUDE.
0224	REF	23	LAST	1402	20,2327	20 0032 1	MSU	CDLX	X-AXIS DIFFERENCE, 1'S COMR, AT PI RAD.

R0225 M13 = 1, SO BYPASS THE MULTIPLICATION.

R0226 EXTEND
 R0227 MP M13 (CPHI-CDUX)*M13 SCALED AT PI RADIANS.

0228	REF	21	LAST	1406	20,2330	6 1761 0	AD	AK	P ERROR COMPLETE, SCALED AT PI RAD
0229	REF	3	LAST	1406	20,2331	7 2451 0	TC	OVERSLB2	FIN NEEDLES IN CASE OF CVERFLOW.
0230	REF	22	LAST	1406	20,2332	55 1761 1	TS	AK	
0231					20,2333	0 0016 1	EXTEND		
0232	REF	71	LAST	1405	20,2334	22 061 0	QXCH	ITEMP1	RESTORE Q FOR CHECKBITS RETURN.
0233	REF	3	LAST	1405	20,2335	1 2456 0	TCF	RETAMORE	DISPLAY THESE THE NEXT TIME THROUGH

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R0234 F041 ATTITUDE ERROR DISPLAY SUBROUTINE

R0235 PROGRAM DESCRIPTION: D. KLENE 5/24/67

R0236 MOD 1 BY CRAIG WORK, 12 DEC 67

R0237 MOD 2 BY CRAIG WORK, 6 APRIL 68 CONVERTS ATTITUDE ERROR DISPLAY SCALING FROM 16 7/8 DEG. TO 42 3/16 DEGREES.

R0239 THIS SUBROUTINE IS USED TO DISPLAY ATTITUDE ERRORS ON THE F041 VIA THE DIGITAL TO ANALOG CONVERTERS (DACS)
 R0241 IN THE CDUS. CARE IS TAKEN TO METER OUT THE APPROPRIATE NUMBER OF PULSES TO THE IMU ERROR COUNTERS AND PREVENT
 R0242 OVERFLOW, TO CONTROL THE DISPLAY SEQUENCING, AND TO AVOID INTERFERENCE WITH THE COARSE ALIGN LOOP WHICH ALSO USES
 R0245 THE DACS.

R0246 CALLING SEQUENCE:

R0247 DURING THE INITIALIZATION SECTION OF THE USER'S PROGRAM, BIT3 OF RCSFLAGS SHOULD BE SET TO INITIATE THE
 R0249 TURN-ON SEQUENCE WITHIN THE NEEDLES PROGRAM:

R0250	CS	RCSFLAGS	IN FRANK6
R0251	MASK	BIT3	
R0252	ADS	RCSFLAGS	

R0253 THEREAFTER, THE ATTITUDE ERRORS GENERATED BY THE USER SHOULD BE TRANSFERRED TO THE FOLLOWING LOCATIONS IN FRANK6:

R0255	AK	SCALED 180 DEGREES	NOTE: THESE LOCATIONS ARE SUBJECT
R0256	AK1	SCALED 180 DEGREES	TO CHANGE
R0257	AK2	SCALED 180 DEGREES	

R0258 FULL SCALED DEFLECTION OF THE NEEDLES CORRESPONDS TO 5 1/16 DEGREES, WHILE 384 BITS IN THE IMU ERROR COUNTER
 R0260 CORRESPONDS TO 42 3/16 DEGREES. (DAC MAXIMUM CAPACITY IS 384 BITS.) 46 BITS EFFECTIVELY PIN THE NEEDLES.

R02611 FOR RATE DISPLAY, FULL SCALE NEEDLE DEFLECTION IS 1 17/64 DEG/SEC, AND A FULL COUNTER IS ABOUT 10.5 DEG/SEC.
 R0262 A CALL TO NEEDLER WILL THEN UPDATE THE DISPLAY:

R0263	INFINT		
R0264	TC	IBAKCALI	NOTE: FRANK SHOULD BE SET TO E6
R0265	CADR	NEEDLER	
R0266	REFINT		

R0267 THIS PROCESS SHOULD BE REPEATED EACH TIME THE ERRORS ARE UPDATED. AT LEAST 3 PASSES THRU THE PROGRAM ARE
 R0269 REQUIRED BEFORE ANYTHING IS ACTUALLY DISPLAYED ON THE ERROR METERS.
 R0270 NOTE: EACH CALL TO NEEDLER MUST BE SEPARATED BY AT LEAST 50MS TO ASSURE PROPER RELAY SEQUENCING.

R0272 ERASABLE USED:

R0273	AK	CDUXCMD
R0274	AK1	CDUYCMD
R0275	AK2	CDUZCMD
R0276	FORIVX	A,L,C
R0277	FORIVEY	T5TEMP

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RC278 EDRIVE2 CINDX

R0279 SWITCHES: ROSEFLAGS BITS 2,2

R0280 I/O CHANNELS: CHAN12 BIT 4 (COARSE ALIGN - READ ONLY)

R0281 CHAN12 BIT 6 (IMU ERROR COUNTER ENABLE)

R0282 CHAN14 BIT 13,14,15 (DAC ACTIVITY)

R0283 SIGN CONVENTIONS AK = THETAC - THETA

R0284 WHERE THETAC = COMMAND ANGLE

R0285 THETA = PRESENT ANGLE

0286 REF 14 LAST 1404 20,2336 3 1262 0 NEEDLER CA ROSEFLAGS

0287 REF 25 LAST 1360 20,2337 7 6245 0 MASK SIX

0288 20,2340 0 0006 1 EXTEND

0289 REF 1 20,2341 1 2276 0 BZF NEEDLES3

0290 REF 40 LAST 1400 20,2342 7 4751 1 MASK BIT3

0291 20,2343 0 0006 1 EXTEND

0292 REF 1 20,2344 1 2267 0 BZF NEEDLER2

BIT3 = 0, BIT2 = 1

0293 REF 63 LAST 1400 20,2345 4 4746 1 CS BIT6

0294 20,2346 0 0006 1 EXTEND

0295 REF 66 LAST 1403 20,2347 03 012 1 WARD CHAN12

0296 REF 278 LAST 1403 20,2350 4 4755 0 NEEDLER11 CS ZPRD

0297 REF 22 LAST 1406 20,2351 55 1761 1 TS AK

0298 REF 1 20,2352 55 1762 1 TS AK1

0299 REF 1 20,2353 55 1763 0 TS AK2

0300 REF 3 LAST 138 20,2354 55 1764 1 TS EDRIVEY

0301 REF 1 20,2355 55 1765 0 TS EDRIVEY

0302 REF 1 20,2356 55 1766 0 TS EDRIVEZ

0303 REF 4 LAST 1302 20,2357 54 050 0 TS CDUXCMD

0304 REF 2 LAST 175 20,2360 54 051 1 TS CDLYCMD

0305 REF 2 LAST 176 20,2361 54 052 1 TS CDLZCMD

0306 REF 26 LAST 1408 20,2362 4 6245 0 CS SIX

0307 REF 15 LAST 1408 20,2363 7 1262 1 MASK ROSEFLAGS

0308 REF 51 LAST 1284 20,2364 6 4752 0 AD BIT2

0309 REF 15 LAST 1408 20,2365 55 1262 1 TS ROSEFLAGS

0310 REF 4 LAST 1406 20,2366 1 2456 0 TCF RETNMCRE

FIRST PASS BIT3 = 1
DISABLE IMU ERROR COUNTER TO ZERO DACS
MUST WAIT AT LEAST 60 MS BEFORE
ENABLING COUNTERS.
ZERO THE INPUTS ON FIRST PASS

ZERO THE DISPLAY REGISTERS

ZERO THE CUT COUNTERS

RESET ROSEFLAGS FOR PASS2

0311 REF 64 LAST 1408 20,2367 3 4746 0 NEEDLER2 CAF BIT6

0312 20,2370 0 0006 1 EXTEND

0313 REF 67 LAST 1408 20,2371 05 012 1 WCR CHAN12

0314 REF 27 LAST 1408 20,2372 4 6245 0 CS SIX

0315 REF 17 LAST 1408 20,2373 7 1262 1 MASK ROSEFLAGS

0316 REF 18 LAST 1408 20,2374 55 1262 1 TS ROSEFLAGS

0317 REF 5 LAST 1408 20,2375 1 2456 0 TCF RETNMCRE

ENABLE IMU ERROR COUNTERS

RESET ROSEFLAGS TO DISPLAY ATTITUDE
ERRORS WAIT ATLEAST 4 MS FOR
RELAY CLOSURE

0318 REF 65 LAST 1408 20,2376 3 4746 0 NEEDLES2 CAF BIT6 CHECK TO SEE IF IMU ERROR COUNTER

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0319	REF	68	LAST	1408	20,2400	02 012 0	EXTEND	IS ENABLED
0320	REF	481	LAST <td>1405</td> <td>20,2401 <td>10 000 0</td> <td>REAR CHAN12</td> <td></td> </td>	1405	20,2401 <td>10 000 0</td> <td>REAR CHAN12</td> <td></td>	10 000 0	REAR CHAN12	
0321	REF	1			20,2402 <td>1 2407 1</td> <td>CCS A</td> <td>IF NOT, RE-INITIALIZE NEEDLES.</td>	1 2407 1	CCS A	IF NOT, RE-INITIALIZE NEEDLES.
0322	REF	19	LAST <td>1408</td> <td>20,2403</td> <td>4 1262 1</td> <td>TCF NEEDLES</td> <td></td>	1408	20,2403	4 1262 1	TCF NEEDLES	
0323	REF	41	LAST <td>1408</td> <td>20,2404</td> <td>7 4751 1</td> <td>CS RCSEFLAGS</td> <td>SET UP INITIALIZATION FLAG IN RCSEFLAGS.</td>	1408	20,2404	7 4751 1	CS RCSEFLAGS	SET UP INITIALIZATION FLAG IN RCSEFLAGS.
0324	REF	20	LAST <td>1405</td> <td>20,2405</td> <td>27 252 1</td> <td>MASK BIT3</td> <td></td>	1405	20,2405	27 252 1	MASK BIT3	
0325	REF	6	LAST <td>1408</td> <td>20,2406</td> <td>1 2456 0</td> <td>ADS RCSEFLAGS</td> <td></td>	1408	20,2406	1 2456 0	ADS RCSEFLAGS	
0326	REF	94	LAST <td>1402</td> <td>20,2407</td> <td>3 4752 0</td> <td>TCF RETNMORE</td> <td></td>	1402	20,2407	3 4752 0	TCF RETNMORE	
0327	REF	1			20,2410	54 163 0	NEEDLES CAF TWO	
0328	REF	1			20,2411	4 2450 0	IS DINDEX	
0329	REF	1			20,2412	0 000 1	CS ONE TENTH	RESCALE INPUTS TO + OR - 1800 DEGREES.
0330	REF	2	LAST <td>1405</td> <td>20,2412</td> <td>5 0063 1</td> <td>EXTEND</td> <td></td>	1405	20,2412	5 0063 1	EXTEND	
0331	REF	24	LAST <td>1408</td> <td>20,2414</td> <td>7 1761 1</td> <td>INDEX DINDEX</td> <td></td>	1408	20,2414	7 1761 1	INDEX DINDEX	
0332	REF	271	LAST <td>1404</td> <td>20,2415</td> <td>54 001 1</td> <td>MP AK</td> <td></td>	1404	20,2415	54 001 1	MP AK	
0333	REF	482	LAST <td>1405</td> <td>20,2416</td> <td>10 000 0</td> <td>TS L</td> <td></td>	1405	20,2416	10 000 0	TS L	
0334	REF	1			20,2417	3 2446 0	CCS A	
0335	REF	1			20,2420	1 2422 0	CAF DACLIMIT	
0336	REF	2	LAST <td>1409</td> <td>20,2421</td> <td>4 2446 1</td> <td>TCF +2</td> <td></td>	1409	20,2421	4 2446 1	TCF +2	
0337	REF	272	LAST <td>1405</td> <td>20,2422</td> <td>6 000 0</td> <td>CS DACLIMIT</td> <td></td>	1405	20,2422	6 000 0	CS DACLIMIT	
0338	REF	1			20,2423	54 061 1	AD L	
0339	REF	1			20,2424	1 2430 0	TS TSTEMP	CVELOC CLK
0340	REF	483	LAST <td>1405</td> <td>20,2425</td> <td>50 000 1</td> <td>TCF +4</td> <td></td>	1405	20,2425	50 000 1	TCF +4	
0341	REF	3	LAST <td>1405</td> <td>20,2426</td> <td>3 2446 0</td> <td>INDEX A</td> <td>ON OVERFLOW LIMIT OUTPUT TO +-384</td>	1405	20,2426	3 2446 0	INDEX A	ON OVERFLOW LIMIT OUTPUT TO +-384
0342	REF	273	LAST <td>1405</td> <td>20,2427</td> <td>54 001 1</td> <td>CAF DACLIMIT</td> <td></td>	1405	20,2427	54 001 1	CAF DACLIMIT	
0343	REF	3	LAST <td>1405</td> <td>20,2430</td> <td>50 063 1</td> <td>TS L</td> <td></td>	1405	20,2430	50 063 1	TS L	
0344	REF	4	LAST <td>1408</td> <td>20,2431</td> <td>4 1764 1</td> <td>INDEX DINDEX</td> <td></td>	1408	20,2431	4 1764 1	INDEX DINDEX	
0345	REF	274	LAST <td>1409</td> <td>20,2432</td> <td>6 000 1 0</td> <td>CS DERIVEX</td> <td>CURRENT VALUE OF CAC</td>	1409	20,2432	6 000 1 0	CS DERIVEX	CURRENT VALUE OF CAC
0346	REF	4	LAST <td>1405</td> <td>20,2433</td> <td>50 062 1</td> <td>AC L</td> <td></td>	1405	20,2433	50 062 1	AC L	
0347	REF	5	LAST <td>1408</td> <td>20,2434</td> <td>26 050 0</td> <td>INDEX DINDEX</td> <td></td>	1408	20,2434	26 050 0	INDEX DINDEX	
0348	REF	5	LAST <td>1405</td> <td>20,2435</td> <td>50 063 1</td> <td>ADS CDUXCMD</td> <td></td>	1405	20,2435	50 063 1	ADS CDUXCMD	
0349	REF	5	LAST <td>1405</td> <td>20,2436</td> <td>23 764 0</td> <td>INDEX DINDEX</td> <td></td>	1405	20,2436	23 764 0	INDEX DINDEX	
0350	REF	6	LAST <td>1409</td> <td>20,2437</td> <td>10 063 0</td> <td>LXCH DERIVEX</td> <td></td>	1409	20,2437	10 063 0	LXCH DERIVEX	
0351	REF	1			20,2440	1 2410 1	CCS DINDEX	
0352	REF	5	LAST <td>1362</td> <td>20,2441</td> <td>3 7743 0</td> <td>TCF DACLECP</td> <td></td>	1362	20,2441	3 7743 0	TCF DACLECP	
0353	REF	23	LAST <td>1316</td> <td>20,2442</td> <td>0 000 1</td> <td>CAF 13,14,15</td> <td></td>	1316	20,2442	0 000 1	CAF 13,14,15	
0354	REF	7	LAST <td>1405</td> <td>20,2443</td> <td>05 014 1</td> <td>EXTEND</td> <td></td>	1405	20,2443	05 014 1	EXTEND	
0355	REF	1			20,2444	1 2456 0	WCR CHAN14	SET CAC ACTIVITY BITS
0356	REF	1			20,2445	77177 0	TCF RETNMORE	
0357	REF	1			20,2446	37200 1	CFC -384	
0358	REF	1			20,2447	00600 1	DACLIMIT CFC 16000	
0359	REF	1			20,2448	00600 1	CFC 384	
0360	REF	56	LAST <td>1356</td> <td>20,2450</td> <td>03146 1</td> <td>ONE TENTH OCT 03146</td> <td>CFCIMAL +0.1, SCALED AT 1.</td>	1356	20,2450	03146 1	ONE TENTH OCT 03146	CFCIMAL +0.1, SCALED AT 1.
0361	REF	1			20,2451	54 067 1	DSPLYALT EQUALS BIT4	100 MS ALTERNATION BIT IN RCSEFLAGS
0362	REF	1			20,2452	00000 1	OVERSL2 TS 7	RETURNS A UNCHANGED CR LIMITED TO

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0363	REF 396	LAST 1398	20,2452	0 0012 0	TC	Q
0364	REF 484	LAST 1405	20,2453	50 000 1	INDEX	A
0365	REF 7	LAST 1385	20,2454	4 4734 1	CS	LIMITS
0366	REF 397	LAST 1410	20,2455	0 0012 0	TC	Q

PCSMAX CR NEEMAX IF A HAS OVERFLOW

DUPLICATE CODING IN BANK 16

0367			20,2456	0 0006 1	RETURN MORE	EXTEND
0368	REF 1		20,2457	3 2462 0	DCA	MORECADR
0369			20,2450	52 006 0	CTCB	

RETURN TO CHECK MORE

0370	REF 17	LAST 1403	20,1537		EBANK=	ACSC
0371	REF 1		20,2461	02 016 1	MORECADR	2CADR CHECK MORE
0371	REF 1		20,2462	34106 1		

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0001                                16,2213          BANK 16
0002 REF 2 LAST 1401          16,2210          SETLOC DAPS1
0003                                16,2213          BANK

0004 REF 2 LAST 1405          16,1464          FBANK= PERFRF
0005 REF 1                                COUNT* $$DARD

R0006 THE FOLLOWING T5FLPT ENTRY BEGINS THE PROGRAM WHICH CONTROLS THE R-AXIS ACTION OF THE LEM USING THE RCS JETS.
R0008 THE NOMINAL TIME BETWEEN THE P-AXIS RPTS IS 100 MS IN ALL NON-IDLING MODES OF THE CAP.

0010 REF 2 LAST 1402          16,2213 3 7732 0 PAXIS CA MS100
0011 REF 5 LAST 1402          16,2214 26 130 0 ADS TIME5 *** NECESSARY IN ORDER TO ALLOW SYN-
A0115                                     CHRONIZATION WITH OTHER INTERRUPTS ***

0012 REF 13 LAST 1401          16,2215 22 016 0 LXCH BANKRUPT INTERPLOT LEAD IN (CONTINUED)
0013                                16,2216 0 0006 1 EXTEND
0014 REF 12 LAST 1401          16,2217 22 112 1 RXCH QRLPT

R0015 CHECK IF CAP PASS IS PERMISSIBLE

0016 REF 2 LAST 1402          16,2220 11 757 1 CCS DAPZRLPT IF DAPZRLPT POSITIVE, CAP (JASK) IS
0017 REF 3 LAST 1350          16,2221 0 5624 1 TC BAILCUT STILL IN PROGRESS AND A RESTART IS
0018                                16,2222 32 000 0 CCT 32000 CALLED FOR. IT IS NEVER ZERO

0019 REF 2 LAST 1401          16,2223 0 2000 0 TC CHEKBITS RETURN IS TC I+1 IF CAP SHOULD STAY ON.

00191 REF 24 LAST 1406          16,2224 3 0032 0 CA CCUX READ AND STORE CCUXS
00192 REF 2 LAST 132          16,2225 55 750 0 TS DAPTRG4
00193 REF 12 LAST 1405          16,2226 3 0133 1 CA CCUY
00194 REF 2 LAST 132          16,2227 55 751 1 TS DAPTRG5
00195 REF 16 LAST 1405          16,2228 3 0034 0 CA COLZ
00196 REF 2 LAST 134          16,2231 55 752 1 TS DAPTRG6

R0020 ***** KALCMANU-CAR AND "RATE-HOLD"-CAR INTERFACE *****

R0021 THE FOLLOWING SECTION IS EXECUTED EVERY 100 MS (10 TIMES A SECOND) WITHIN THE P-AXIS REACTION CONTROL SYSTEM
R0023 AUTOPILOT (WHenever THE CAP IS IN OPERATION).

0024 REF 18 LAST 1398          16,2232 3 1625 0 CA COLXD
0025                                16,2233 0 0006 1 EXTEND
0026 REF 6 LAST 1398          16,2234 21 640 0 NSL DELCOLX
0027 REF 1          16,2235 0 2256 1 TC 1STOTWCS
0028 REF 19 LAST 1411          16,2236 55 535 1 TS CCUXD
0029 REF 5 LAST 1398          16,2237 3 1626 0 CA COLYD
0030                                16,2240 0 0006 1 EXTEND
0031 REF 3 LAST 1398          16,2241 21 641 1 NSL DELCOLY
0032 REF 2 LAST 1411          16,2242 0 2256 1 TC 1STOTWCS
0033 REF 6 LAST 1411          16,2243 55 536 1 TS CCUYD
0034 REF 5 LAST 1398          16,2244 3 1637 1 CA COLZD
0035                                16,2245 0 0006 1 EXTEND
0036 REF 3 LAST 1398          16,2246 21 642 1 NSU DELCOLZ

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0037 REF 3 LAST 1411 16,2247 0 2256 1
 0038 REF 6 LAST 1411 16,2250 55'637 0
 00381 16,2251 0 0' 6 1
 00382 REF 1 16,2252 27'445 1
 00383 16,2253 0 0'06 1
 00384 REF 1 16,2254 27'457 1

A0039 RATELOOP COMPUTES JETRATEQ, JETRATER, AND 1JACC*NO. PJETS IN ITEMPL.
 A0041 RETURNS TO BACKP.

A0041 JETRATE = 1JACC*NO.PJETS*TJP (NOTE TJ IS THE TIME FIRED CLIPING CSP)

A0042 JETRATEQ= 1JACCQ(TJU*NO.UJETS - TJV*NO.VJETS)

A0043 JETRATER= 1JACCR(TJL*NO.UJETS + TJV*NO.VJETS)

0044 REF 1 16,2255 1 2647 1 TCF PAYFILT PROCEEDS TO RATELOOP AFTER SUPERJCB
 0045 REF 485 LAST 1410 16,2256 10 013 0 1STOTWCS CCS A
 0046 REF 155 LAST 1391 16,2257 6 4753 1 AD CNF
 0047 REF 355 LAST 1410 16,2260 0 0002 0 TC Q
 0048 REF 486 LAST 1412 16,2261 4 0000 0 CS A
 0049 REF 355 LAST 1412 16,2262 0 1002 0 TC Q
 0050 16,2263 0 0006 1

0051 REF 3 LAST 134 16,2264 7 1741 0 SLPCIVCE EXTENC OVERFLOW PROTECTION ROUTINE TO GIVE
 0052 REF 3 LAST 131 16,2265 21'427 0 MP DAPTEMP3 FCSMAX OR NEGMAX IF THE CIVICE WOULD
 CAS OMEGAU OVERFLOW

0053 16,2266 0 0006 1 +3 EXTENC
 00531 REF 4 LAST 1412 16,2267 3 1427 1 DCA OMEGAL
 00532 REF 2 LAST 132 16,2270 53'744 0 EXCH DAPTEMP5
 00533 REF 5 LAST 1412 16,2271 11'426 1 CCS OMEGAL
 0054 16,2272 1 2274 0 TCF +2
 0055 REF 1 16,2273 1 2304 0 TCF CIVICIFR
 0056 REF 1 16,2274 6 2315 1 AD -DCT630
 0057 16,2275 0 0006 1 EXTENC
 0058 REF 2 LAST 1412 16,2276 6 2304 1 BZMF CIVICIFR

0059 REF 6 LAST 1412 16,2277 11'426 1 CCS OMEGAL
 0060 REF 37 LAST 1402 16,2278 3 4733 1 CA POSMAX 45 DEG/SEC
 0061 REF 400 LAST 1412 16,2281 0 0' 2 0 TC Q
 0062 REF 38 LAST 1412 16,2282 4 4733 0 CS POSMAX
 0063 REF 401 LAST 1412 16,2283 0 0' 2 0 TC Q

0064 REF 7 LAST 1412 16,2284 53'427 0 CIVICIFR EXCH OMEGAL
 0065 16,2285 0 0006 1 EXTENC
 0066 REF 3 LAST 1411 16,2286 11'750 0 DV DAPTEMP4
 0067 REF 412 LAST 1412 16,2287 0 0' 02 0 TC Q

0068 16,2288 54 007 1 OVERSLP TS 7 RETURNS A UNCHANGED OR LIMITED TO
 0069 REF 413 LAST 1412 16,2289 0 0002 0 TC Q FCSMAX OR NEGMAX IF A FAS OVERFLOW
 0070 REF 487 LAST 1412 16,2292 50 000 1 INCFX A
 0071 REF 45 LAST 1354 16,2293 4 4734 1 CS BIT15 -1

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0072	REF 404	LAST 1412	16,2314	0 0002 0	TC	0	
0073			16,2315	77147 0	-ECT630	ECT	77147
0074	REF 19	LAST 138	16,2316	3 1737 0	RACKP	CA	DAPTEVP1
0075			16,2317	0 0006 1		EXTEND	
0076	REF 7	LAST 911	16,2320	7 1537 1	MP	1JACC	
0077	REF 3	LAST 133	16,2321	55'745 1	TS	JETRATE	
A0078					BEGINNING OF THE RATE DERIVATION		
A0079					OMEGAP,Q,R	BODY RATES SCALED AT PI/4	
A0080					TRAPED,Q,R	BODY ANGLE ERRORS FROM PREDICTED ANGLE (PI/40)	
A0081					NP(QR)TRAPS	NUMBER OF TIMES ANGLE ERROR HAS BEEN ACCUMULATED	
A0082					ACSG(R)TERM	CHANGE IN RATE DUE TO OFFSET ACCELERATION. (PI/4)	
A0083					JETRATE,G,F	CHANGE IN RATE DUE TO JET ACCELERATION. (PI/4)	
A0084					TRAPSIZE	NEGATIVE LIMIT OF MAGNITUDE OF TRAPEZ,ECT.	
A0086					OMEGA	DP-TEMPORARY STORAGE	
A0087					OMEGA = OMEGA + JETRATE + ACSTERM (+TRAPED/NTRAPS IF TRAPED BIG)		
0088	REF 4	LAST 1412	16,2322	31'750 1	CAF	DAPTRFG4	CDLX IS STORED HERE
0089	REF 275	LAST 1405	16,2323	54 001 1	TS	L	
0090			16,2324	0 0006 1		EXTEND	
0091	REF 4	LAST 1402	16,2325	21'440 1	MSU	CLDXFCRP	SCALED AT PI
0092	REF 5	LAST 1413	16,2326	23'440 0	LXCH	CLDXFCRP	
0093	REF 20	LAST 1413	16,2327	55'737 1	TS	DAPTRFNP1	
0094	REF 1		16,2330	3 3624 1	CA	1/40	
0095	REF 5	LAST 1412	16,2331	55'750 0	TS	DAPTRFEG4	
0096	REF 4	LAST 1412	16,2332	4 1745 1	CS	JETRATE	
0097			16,2333	7 0006 1		EXTEND	
0098	REF 82	LAST 1392	16,2334	7 4736 0	MP	BIT14	
0099	REF 7	LAST 1401	16,2335	27'430 0	ADS	TRAPEDP	
0100	REF 1		16,2336	3 1746 0	CA	JETRATEG	
0101	REF 4	LAST 1401	16,2337	6 1545 1	AD	ACSGTERM	
0102			16,2340	0 0006 1		EXTEND	
0103	REF 1		16,2341	7 7741 0	MP	-BIT14	
0104	REF 2	LAST 1401	16,2342	27'431 1	ADS	TRAPEDG	
0105	REF 1		16,2343	3 1747 1	CA	JETRATER	
0106	REF 3	LAST 1401	16,2344	6 1546 1	AD	ACSGTERM	
0107			16,2345	0 0006 1		EXTEND	
0108	REF 2	LAST 1412	16,2346	7 7741 0	MP	-BIT14	
0109	REF 2	LAST 1401	16,2347	27'432 1	ADS	TRAPEDR	
0110	REF 3	LAST 1411	16,2350	3 1751 0	CA	DAPTRFEG5	CDLX IS STORED HERE
0111	REF 276	LAST 1413	16,2351	54 001 1	TS	L	
0112			16,2352	0 0006 1		EXTEND	
0113	REF 1		16,2353	21'441 0	MSU	CLDYFCRP	SCALED AT PI
0114	REF 2	LAST 1413	16,2354	23'441 1	LXCH	CLDYFCRP	
0115	REF 3	LAST 134	16,2355	55'740 1	TS	DAPTRFNP2	
0116			16,2356	0 0006 1		EXTEND	
0117	REF 8	LAST 1406	16,2357	7 1414 0	MP	M11	M11 SCALED AT 1

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0118	REF	21	LAST	1412	16,2360	6 1737 0	AC	DAPTEMP1	
0119	REF	8	LAST	1412	16,2361	53'427 0	EXCH	CMFGAL	
0120	REF	1			16,2362	0 2266 1	TC	SLBDIVDE +3	RETURNS WITH CDU-RATE AT PI/4
0121					16,2363	0 0006 1	EXTEND		
0122	REF	1	LAST	1405	16,2364	61'421 1	SL	CMFGAL	
0123	REF	8	LAST	1412	16,2365	27'430 0	ADS	TRAPEDP	
0124	REF	1			16,2366	0 2310 1	TC	CMFGAL	
0125	REF	9	LAST	1414	16,2367	55'430 0	TS	TRAPEDP	
0125C1					16,2370	0 0006 1	EXTEND		
0125C2	REF	3	LAST	1412	16,2371	3 1744 1	CCA	DAPTEMP5	
0125C3	REF	3	LAST	131	16,2372	21'447 0	CAS	DYERROR	
0125C4	REF	1			16,2373	4 1454 1	CS	GLAST	
0125C5					16,2374	0 0006 1	EXTEND		
0125C6	REF	2	LAST	1413	16,2375	7 3624 0	MP	1/40	
0125C7	REF	4	LAST	1414	16,2376	21'447 0	CAS	DYERROR	MANUAL MODE X-ATTITUDE ERROR (DP)
0126	REF	3	LAST	1411	16,2377	3 1752 0	CA	DARTREG6	CDLZ IS STORED HERE
0127	REF	277	LAST	1413	16,2400	54 001 1	TS	L	
0128					16,2401	0 0006 1	EXTEND		
0129	REF	2	LAST	1402	16,2402	21'442 0	MSU	GLDZFCRQ	
0130	REF	4	LAST	1412	16,2403	55'741 0	TS	DAPTEMP3	
0131	REF	3	LAST	1414	16,2404	22'442 1	EXCH	GLDZFCRQ	
0132	REF	3	LAST	1405	16,2405	3 1415 0	CA	M21	
0133					16,2406	0 0006 1	EXTEND		
0134	REF	4	LAST	1413	16,2407	7 1740 1	MP	DAPTEMP2	
0135	REF	9	LAST	1414	16,2410	53'427 0	EXCH	CMFGAL	
0136	REF	6	LAST	1405	16,2411	3 1417 1	CA	M22	
0137	REF	2	LAST	1414	16,2412	0 2263 1	TC	SLBDIVDE	
0138					16,2413	0 0006 1	EXTEND		
0139	REF	8	LAST	1405	16,2414	61'422 1	SL	CMFGAL	
0140	REF	3	LAST	1412	16,2415	27'431 1	ADS	TRAPEDP	
0141	REF	2	LAST	1414	16,2416	0 2310 1	TC	CMFGAL	
0142	REF	4	LAST	1414	16,2417	55'431 1	TS	TRAPEDP	
0142C1					16,2420	0 0006 1	EXTEND		
0142C2	REF	4	LAST	1414	16,2421	3 1744 1	CCA	DAPTEMP5	
0142C3	REF	2	LAST	131	16,2422	21'451 1	CAS	DYERROR	
0142C4	REF	1			16,2423	4 1455 0	CS	GLAST	
0142C5					16,2424	0 0006 1	EXTEND		
0142C6	REF	3	LAST	1414	16,2425	7 3624 0	MP	1/40	
0142C7	REF	3	LAST	1414	16,2426	21'451 1	CAS	DYERROR	MANUAL MODE Y-ATTITUDE ERROR (CP)
0143	REF	3	LAST	1406	16,2427	3 1416 0	CA	M21	
0144					16,2430	0 0006 1	EXTEND		
0145	REF	5	LAST	1414	16,2431	7 1740 1	MP	DAPTEMP2	
0146	REF	1	LAST	1414	16,2432	53'427 0	EXCH	CMFGAL	
0147	REF	4	LAST	1406	16,2433	3 1420 0	CA	M22	
0148	REF	3	LAST	1414	16,2434	0 2263 1	TC	SLBDIVDE	

L P-AXIS RCS AUTOCILCT

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0149 16,2435 0 0006 1
 0150 REF 3 LAST 1415 16,2436 61'423 1
 0151 REF 2 LAST 1413 16,2437 27'432 1
 0152 REF 2 LAST 1414 16,2440 0 2310 1
 0153 REF 4 LAST 1415 16,2441 55'432 1

EXTEND
 SL DMEGAP
 ADS TRARECR
 TC CVRSLR
 TS TRARECR

TRAPEDS HAVE ALL BEEN COMPUTED

015301 16,2442 0 0006 1
 015302 REF 5 LAST 1414 16,2442 3 1744 1
 015303 REF 2 LAST 131 16,2444 21'453 0
 015304 REF 1 16,2445 4 1456 0
 015305 16,2446 0 0006 1
 015306 REF 4 LAST 1414 16,2447 7 3624 0
 015307 REF 2 LAST 1415 16,2450 21'453 0
 01531 REF 36 LAST 1401 16,2451 3 0111 0
 01532 REF 7 LAST 903 16,2452 7 4737 1

EXTEND
 DCA DAPTRMP5
 CAS DZFRRCR
 CS PLAST
 EXTEND
 MP 1/40
 CAS DZFRRCR
 CA DAPBODLS
 MASK CSMDOCK

MANUAL MODE 2-ATTITUDE ERROR (EP)
 RICK UP FAC LOADED STATE ESTIMATOR GAINS

01534 16,2453 0 0006 1
 01534 REF 1 16,2454 1 2462 1
 01535 16,2455 0 0006 1
 01536 REF 2 LAST 214 16,2456 3 1405 1
 01537 REF 6 LAST 1413 16,2457 53'751 1
 01538 REF 2 LAST 212 16,2460 3 1403 1
 015382 16,2461 1 2466 0
 015384 16,2462 0 0006 1

EXTEND
 BZF LMDONLY
 EXTEND
 DCA DKMEGAN
 EXCH DAPTRFG4
 CA DKTRAF
 TCF +5

DOCKED

015386 REF 2 LAST 214 16,2463 3 1410 0
 015388 REF 7 LAST 1415 16,2464 53'751 1
 01539 REF 2 LAST 213 16,2465 3 1406 1
 015392 REF 4 LAST 1414 16,2466 55'752 1
 0154 REF 10 LAST 1414 16,2467 11'432 0

LMDONLY

EXTEND
 DCA LMDMEGAN
 EXCH DAPTRFG4
 CA LMDTRAF
 TS DAPTRFG6
 CCS TRAPFEP
 TCF +2

UNDOCKED

0155 16,2470 1 2472 0
 0156 REF 1 16,2471 1 2507 0
 0157 REF 5 LAST 1415 16,2472 6 1752 0
 0158 16,2473 0 0006 1
 0159 REF 2 LAST 1415 16,2474 6 2507 1
 0160 16,2475 22 007 0
 0161 REF 11 LAST 1415 16,2476 23'430 1

AD DAPTRFG6
 EXTEND
 RMF SMALPCIF
 ZL
 EXCH TRAPFEP
 CA ZFEC

TRANSIZE > ABOUT 77001 $\approx 1.4 \text{ DEG/SEC}$

0162 REF 279 LAST 1408 16,2477 3 4755 1
 0163 16,2500 0 0006 1
 0164 REF 2 LAST 1402 16,2501 11'433 0
 0165 REF 11 LAST 1414 16,2502 27'421 0
 0166 REF 4 LAST 1415 16,2503 0 2310 1
 0167 REF 12 LAST 1415 16,2504 55'421 0
 0168 REF 8 LAST 1415 16,2505 3 1750 1

TS DAPTRFG6
 CA DAPTRFG4
 TS NETRAPS
 ADS DMEGAP
 TC CVRSLR

ABOUT 10 OR 0 FOR DOCKED OR UNDOCKED

0169 REF 3 LAST 1415 16,2506 55'433 0
 0170 REF 4 LAST 1415 16,2507 25'433 1
 0171 REF 5 LAST 1413 16,2510 3 1745 0
 0172 REF 13 LAST 1415 16,2511 27'421 0
 0173 REF 5 LAST 1415 16,2512 0 2310 1
 0174 REF 14 LAST 1415 16,2513 55'421 0

SMALPCIF
 P-PATE

CA DAPTRFG4
 TS NETRAPS
 CA JETRAF
 ADS DMEGAP
 TC CVRSLR
 TS DMEGAP

0175 REF 5 LAST 1414 16,2514 11'431 1

CCS TRARECR

L P-AXIS RCS AUTOPILOT

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0176 16,2515 1 2517 1
 0177 REF 1 16,2516 1 2544 1
 0178 REF 6 LAST 1415 16,2517 6 1752 0
 0179 16,2520 0 2006 1
 0180 REF 2 LAST 1416 16,2521 6 2544 0
 0181 16,2522 22 007 0
 0182 REF 6 LAST 1415 16,2523 23 431 0
 0183 REF 28 LAST 1415 16,2524 3 4755 1
 0184 16,2527 0 0006 1
 0185 REF 2 LAST 1402 16,2526 11 434 1
 0186 REF 22 LAST 1414 16,2527 55 737 1
 0189 REF 9 LAST 1414 16,253 27 422 0
 0190 REF 6 LAST 1415 16,2531 0 2310 1
 0191 REF 11 LAST 1416 16,2532 55 422 0
 0192 REF 9 LAST 1415 16,2533 3 1750 1
 0193 REF 3 LAST 1416 16,2534 57 434 0
 0194 REF 4 LAST 1413 16,2535 6 1751 0
 0195 REF 22 LAST 1416 16,2536 57 737 0
 0196 16,2537 0 0006 1
 0197 REF 23 LAST 1391 16,2540 7 4755 0
 0198 16,2541 0 0006 1
 0199 REF 24 LAST 1416 16,2542 11 737 1
 0200 REF 18 LAST 1410 16,2543 27 537 0
 0201 REF 4 LAST 1416 16,2544 25 434 0
 0202 REF 2 LAST 1413 16,2545 3 1746 0
 0203 REF 5 LAST 1413 16,2546 6 1545 1
 0204 REF 11 LAST 1416 16,2547 27 422 0
 0205 REF 7 LAST 1416 16,255 0 2310 1
 0206 REF 12 LAST 1416 16,2551 55 422 0

 0207 REF 5 LAST 1415 16,2552 11 432 1
 0208 16,2553 1 2555 1
 0209 REF 1 16,2554 1 2602 0
 0210 REF 7 LAST 1416 16,2555 6 1752 0
 0211 16,2556 0 0006 1
 0212 REF 2 LAST 1416 16,2557 6 2602 1
 0213 16,2560 22 007 0
 0214 REF 6 LAST 1416 16,2561 23 432 0
 0215 REF 28 LAST 1416 16,2562 3 4755 1
 0216 16,2563 0 0006 1
 0217 REF 2 LAST 1402 16,2564 11 425 0
 0218 REF 6 LAST 1414 16,2565 55 740 1
 0221 REF 4 LAST 1415 16,2566 27 423 1
 0222 REF 9 LAST 1416 16,2567 0 2310 1
 0223 REF 5 LAST 1416 16,2570 55 423 1
 0224 REF 11 LAST 1416 16,2571 3 1750 1
 0225 REF 3 LAST 1416 16,2572 57 435 1
 0226 REF 5 LAST 1416 16,2573 6 1751 0
 0227 REF 7 LAST 1416 16,2574 57 740 0
 0228 16,2575 0 0006 1

C-RATE

TCF +2
 TCF Q-RATE
 AD DAPTRFG6
 EXTEND
 RZMF C-RATE
 ZL
 LXCF TRAPEDQ
 CA ZERO
 EXTEND
 EV NGTRAPS
 TS DAPTEMP1
 ADS CMFGAG
 TC EVERFSUP
 TS CMFGAG
 CA DAPTRFG4
 XCF NGTRAPS
 AD DAPTRFG5
 XCF DAPTEMP1
 EXTEND
 MP FIVE
 EXTEND
 EV DAPTEMP1
 ADS ADSQ
 INCR NGTRAPS
 CA JSTRATEG
 AD ACSQTRM
 ADS CMFGAG
 TC EVERSLR
 TS CMFGAG

 CCS TRAPEDR
 TCF +2
 TCF R-RATE
 AD DAPTRFG6
 EXTEND
 RZMF R-RATE
 ZL
 LXCF TRAPEDR
 CA ZERO
 EXTEND
 EV NRTRAPS
 TS DAPTEMP2
 ADS CMFGAR
 TC EVERFSUB
 TS CMFGAR
 CA DAPTRFG4
 XCF NRTRAPS
 AD DAPTRFG5
 XCF DAPTEMP2
 EXTEND

TRAPSIZE > ABOUT 77001 \approx 1.4DEG/SEC"

SAVE FOR OFFSET ESTIMATE

ABOUT 10 OR 0 FOR DOCKED OR UNDOCKED

KACS > ABOUT 600 \approx N/A_60"TRAPSIZE > ABOUT 77001 \approx 1.4DEG/SEC"

SAVE FOR OFFSET ESTIMATE

ABOUT 10 OR 0 FOR DOCKED OR UNDOCKED

KACS > ABOUT 600 \approx N/A_60"

L P-Axis RCS AUTOPILOT

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0229	REF	24	LAST	1416	16,2576	7 4756 0	MF	FIVE
023					16,2577	0 0006 1	EXTEND	
0231	REF	8	LAST	1416	16,2600	11 1740 1	CV	DAPTEMP2
0232	REF	6	LAST	1401	16,2601	27 1541 1	ACS	ACSR
0233	REF	4	LAST	1416	16,2602	25 1435 1	R-RATE INCR	NRTRAPS
0234	REF	2	LAST	1413	16,2603	3 1747 1	CA	JFTRATER
0235	REF	4	LAST	1413	16,2604	6 1546 1	AD	ACSRTERM
0236	REF	6	LAST	1416	16,2605	27 1423 1	ACS	OMFGAR
0237	REF	5	LAST	1416	16,2606	0 2311 1	TC	OVERSUB
0238	REF	7	LAST	1417	16,2607	55 1423 1	TS	OMFGAR

A0239 END OF RATE DERIVATION

A0240 BEGIN OFFSET ESTIMATOR

A0241 IN POWERED FLIGHT, ANTASK WILL BE CALLED EVERY 2 SECONDS.

A0242 ACS = ACS + K*SUMRATE

0243	REF	27	LAST	1415	16,2610	4 0111 1	CS	DAPRCLS	
0244	REF	3	LAST	1399	16,2611	7 4744 0	MASK	DRIFTBIT	
0245	REF	488	LAST	1412	16,2612	1 0000 0	CCS	A	
0246	REF	1			16,2613	1 2624 1	TCF	WORKTIME	
0247	REF	4	LAST	1401	16,2614	55 1424 0	TS	ALPHA	ZERO THE OFFSET ACCELERATION VALUES.
0248	REF	2	LAST	1401	16,2615	55 1425 1	TS	ALPHA	
0249	REF	6	LAST	1416	16,2616	55 1545 0	TS	ACSQTERM	
0250	REF	5	LAST	1417	16,2617	55 1546 0	TS	ACSQTERM	
0251	REF	19	LAST	1416	16,2620	55 1537 0	TS	ACSC	
0252	REF	7	LAST	1417	16,2621	55 1541 1	TS	ACSR	
0253	REF	1			16,2622	1 2667 0	TCF	PRETIMCK	
0254					16,2623	00074 1	KACS	DEC	
0255	REF	2	LAST	1401	16,2624	3 1510 1	WORKTIME	CA	QACCDOT
0256					16,2625	0 0006 1	EXTEND		
0257	REF	3	LAST	1407	16,2626	7 4766 0	MP	CALLCODE	DECIMAL C0032 IS DECIMAL .1 AT 2(6).
0258	REF	27	LAST	1417	16,2627	21 1540 0	CAS	ACSC	
0259	REF	21	LAST	1417	16,2630	3 1537 1	CA	ACSC	
0260	REF	5	LAST	1417	16,2631	55 1424 0	TS	ALPHA	
0261					16,2632	0 0006 1	EXTEND		
0262	REF	1			16,2633	7 3622 0	MP	ZOOMS	.2 AT 1
0263	REF	7	LAST	1417	16,2634	55 1545 0	TS	ACSQTERM	
0264	REF	2	LAST	1401	16,2635	3 1512 0	CA	RACCDOT	
0265					16,2636	0 0006 1	EXTEND		
0266	REF	4	LAST	1417	16,2637	7 4766 0	MP	CALLCODE	DECIMAL C0032 IS DECIMAL .1 AT 2(6).
0267	REF	8	LAST	1417	16,2640	21 1542 1	CAS	ACSR	
0268	REF	9	LAST	1417	16,2641	3 1541 0	CA	ACSR	
0269	REF	4	LAST	1417	16,2642	55 1425 1	TS	ALPHA	
0270					16,2643	0 0006 1	EXTEND		
0271	REF	2	LAST	1417	16,2644	7 3622 0	MP	ZOOMS	.2 AT 1
0272	REF	6	LAST	1417	16,2645	55 1546 0	TS	ACSQTERM	
02721	REF	2	LAST	1417	16,2646	1 2667 0	TCF	PRETIMCK	

L P-AXIS POS AUTOPILOT

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R0273

0274	REF	1		16,2647	3 4747 1	PAXFILT	CA	CALLGMBL
02742	REF	21	LAST 1409	16,2650	7 1262 1		MASK	PCSFLGS
02744	REF	489	LAST 1417	16,2651	10 3700 0		CCS	A
02746	REF	1		16,2652	0 3742 0		TC	ACCT+C12

EXECUTE ACCT+C12, IF NEEDED.

CALLGMBL IS NOT BIT15, SO THIS TEST IS VALID.

0275	REF	12	LAST 1121	16,2653	52 011 0		CXCH	ARLPT
0276	REF	4	LAST 138	16,2654	53 1754 1		CXCH	DAPARLPT
0277	REF	1		16,2655	3 2666 0		CA	SUPERJCB
0278	REF	3	LAST 1373	16,2656	56 017 1		XCH	BRLPT
0279	REF	13	LAST 1411	16,2657	22 112 1		LXCH	QRLPT
0280	REF	1		16,2660	53 1756 0		CXCH	DAPBGRPT
0281	REF	1		16,2661	3 2665 0		CA	SUPERADP
0282	REF	1		16,2662	52 016 1		CXCH	ZRLPT
0283	REF	3	LAST 1411	16,2663	53 1761 0		CXCH	DAPZPLPT
0284	REF	1		16,2664	1 5275 0		TCF	NQGBRSM +1

SETTING UP THE SUPERJCB

PFLINT (JUST IN CASE) AND RESUME, IN THE FORM OF A TASK, AT SUPERJOB.

R0286 REF 2 LAST 1418 16,2665 02667 1 SUPERADP GENADR SUPERJCB +1
 R0287 COUNT DOWN GIMBAL DRIVE TIMERS AND TURN OFF DRIVES IF REQUIRED.

0288	REF	1		16,2666	1 3645 1	SUPERJCB	TCF	RATELCDF
02881	REF	4	LAST 1402	16,2667	11 632 0	PRETIMCK	CCS	GGIMTMR
0289	REF	1		16,2670	1 2711 1		TCF	DECQTIMR
0290	REF	1		16,2671	1 2714 0		TCF	TUPNOFFG
0291	REF	2	LAST 1402	16,2672	11 634 0	CHKRTIMP	CCS	RGIMTMR
0292	REF	1		16,2673	1 2712 0		TCF	DECRTIMR
0293	REF	1		16,2674	1 2724 0		TCF	TURNOFFR

POSITIVE- COUNTING DOWN
 NEGATIVE- DRIVE SHOULD BE ENDED
 NEGATIVE- INACTIVE
 (NEG ZFPO- IMPOSSIBLE)
 REPEATED (ABOVE) FOR R AXIS.

0294				16,2675	0 0006 1	EXTEND		
0295	REF	4	LAST 1402	16,2676	27 1767 1	DIM	PJFTCTR	
0296				16,2677	0 0006 1	EXTEND		
0297	REF	2	LAST 1402	16,2700	27 1771 1	DIM	UJFTCTR	
0298				16,2701	0 0006 1	EXTEND		
0299	REF	3	LAST 1402	16,2702	27 1771 0	DIM	VJFTCTR	
0300	REF	37	LAST 1402	16,2703	3 4741 0	CA	BIT12	
0301	REF	22	LAST 1418	16,2704	7 1262 1	MASK	PCSFLGS	
0302				16,2705	0 0006 1	EXTEND		
0303	REF	1		16,2706	1 2734 1	BZF	SKIPPAXS	
0304	REF	1		16,2707	0 2740 0	TC	CHKVISE2	
0305	REF	5	LAST 1418	16,2710	55 1632 0	DECQTIMR	TS	GGIMTMR
0306	REF	1		16,2711	1 2672 1		TCF	CHKPTIMR
0307	REF	3	LAST 1418	16,2712	55 1634 0	DECRTIMR	TS	RGIMTMR
0308	REF	2	LAST 1418	16,2713	1 2675 0		TCF	CHKRTIMR +3

DEPENDENT DOCKED JET INHIBITION COUNTERS

COUNT TIMERS DOWN TO PCS ZERO.

0309	REF	4	LAST 1411	16,2714	55 1501 0	TURNOFFG	TS	NEGUG
0310	REF	3	LAST 1417	16,2715	55 1510 0		TS	QACCDFT
0311	REF	1		16,2716	4 5107 1		CS	GGIMBITS
0312				16,2717	0 0006 1	EXTEND		

HALT DRIVES.

L P-AXIS RCS AUTOPILCT

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0313	REF	69	LAST	1409	16,2720	03 012 1	WAND	CHAN12
0314	REF	8	LAST	1114	16,2721	3 4735 1	CAF	NEGMAX
0315	REF	6	LAST	1418	16,2722	55 632 0	TS	QCIMTIMR
0316	REF	3	LAST	1418	16,2723	1 2672 1	TCF	CHKRTIMR
0317	REF	2	LAST	1411	16,2724	55 502 1	TURNDEFR	TS
0318	REF	3	LAST	1417	16,2725	55 512 1	TS	RACCDCT
0319	REF	1			16,2726	4 5020 1	CS	RGIMETTS
0320					16,2727	0 3206 1	EXTEND	
0321	REF	70	LAST	1419	16,2730	03 012 1	WAND	CHAN12
0322	REF	9	LAST	1419	16,2731	3 4735 1	CAF	NEGMAX
0323	REF	4	LAST	1418	16,2732	55 634 0	TS	PGIMTIMR
0324	REF	4	LAST	1419	16,2733	1 2675 0	TCF	CHKRTIMR +3
0325	REF	12	LAST	1293	5017		QGIMBITS	EQUALS OCT1400
0326	REF	4	LAST	1276	5020		RCIMBITS	EQUALS PRIO6
0327	REF	23	LAST	1418	16,2734	4 1262 1	SKIPPAXS	CS
0328	REF	38	LAST	1418	16,2735	7 4740 1	MASK	PIT12
0329	REF	24	LAST	1419	16,2736	27 262 1	ADS	RCSFLAGS
0330	REF	1			16,2737	1 3630 0	TCF	QRAXIS

BITS 9 AND 10 (OF CHANNEL 12).
BITS 11 AND 12 (OF CHANNEL 12).

BIT 12 SET TO 1.
CC TO GPAXIS CR TO CTS.

A0331

Y-Z TRANSLATION

A0332

INPUT: BITS 9-12 OF CH31 (FROM TRANSLATION CONTROLLER)

A0333

OUTPUT: NEXTP

A0334

NEXTP IS THE CHANNEL 6 CODE OF JETS FOR THE DESIRED TRANSLATION.
IF THERE ARE FAILURES IN THE DESIRED POLICY, THEN

A0335

A0336

(1) FOR DIAGONAL TRANS: UNFAILED PAIR
ALARM (IF NO PAIR)

A0337

A0338

(2) FOR PRINCIPAL TRANS: TRY TO TACK WITH DIAGONAL PAIRS
ALARM (IF DIAGONAL PAIRS ARE FAILED)

A0339

0340					16,2740	0 0006 1	CHKVISFZ	EXTEND
0341	REF	9	LAST	1400	16,2741	00 331 0	READ	CHAN31
0342	REF	450	LAST	1418	16,2742	4 0000 0	CS	A
0343	REF	1			16,2743	7 3617 0	MASK	074000CT
0344					16,2744	0 0006 1	EXTEND	
0345	REF	1			16,2745	1 3014 0	PZF	TSMEXTP
0346					16,2746	0 0006 1	EXTEND	
0347	REF	42	LAST	1289	16,2747	7 4745 1	MP	BIT7
0348	REF	451	LAST	1419	16,2750	50 000 1	INDEX	A
0349	REF	1			16,2751	3 2576 0	CA	INDXYZ
0350	REF	1			16,2752	55 744 0	TS	RTINDEX
0351	REF	28	LAST	1408	16,2753	3 6245 1	CA	SIX
0352	REF	1			16,2754	0 3555 0	TC	SELFCITYZ
0353	REF	29	LAST	1419	16,2755	4 6245 0	CS	SIX
0354	REF	1			16,2756	6 1743 0	AD	NUMBERT
0355					16,2757	0 0006 1	EXTEND	

TRYLCRV

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0356	REF	2	LAST 1410	16,2760	1 3013 1	BZF	TSNEXTP -1	
0357	REF	25	LAST 1417	16,2761	4 4756 0	CS	FIVE	
0358	REF	2	LAST 1419	16,2762	6 1744 1	AD	ROTINDEX	
0359				16,2763	0 0006 1	EXTEND		
0360	REF	1		16,2764	6 3002 0	PZMF	ALTERYZ	
0361	REF	2	LAST 1419	16,2765	4 1743 1	CS	NUMBEFT	
0362	REF	32	LAST 1402	16,2766	6 4751 0	AD	FCUR	
0363				16,2767	0 0006 1	EXTEND		
0364	REF	3	LAST 1420	16,2770	6 3013 0	PZMF	TSNEXTP -1	
0365	REF	49	LAST 1318	16,2771	0 5567 0	TC	ALARM	
0366				16,2772	02001 1	CCT	02001	
0367	REF	57	LAST 1384	16,2773	3 4753 1	CA	BIT1	INVERT EIT 1 OF RCSFLAGS.
0368	REF	25	LAST 1419	16,2774	231262 0	LXCF	RCSFLAGS	
0369				16,2775	0 0006 1	EXTEND		
0370				16,2776	06 001 0	RXOR	1	
0371	REF	26	LAST 1420	16,2777	551262 1	TS	RCSFLAGS	
0372	REF	282	LAST 1416	16,2778	3 4755 1	CA	ZERC	
0373	REF	4	LAST 1420	16,2779	1 3014 0	TCF	TSNEXTP	
0374	REF	58	LAST 1420	16,2780	3 4753 1	CA	BIT1	INVERT EIT 1 OF RCSFLAGS.
0375	REF	27	LAST 1420	16,2781	231262 0	LXCF	RCSFLAGS	
0376				16,2782	0 0006 1	EXTEND		
0377				16,2783	06 001 0	RXCR	1	
0378	REF	28	LAST 1420	16,2784	551262 1	TS	RCSFLAGS	
0379	REF	59	LAST 1420	16,2785	7 4753 0	MASK	BIT1	
0380	REF	33	LAST 1420	16,2786	6 4751 0	AD	FCUR	
0381	REF	3	LAST 1420	16,2787	271744 0	ADS	ROTINDEX	
0382	REF	1		16,2788	1 2753 0	TCF	TRYUCRV	
0383	REF	1		16,2789	3 1741 1	CA	POLYTEMP	
0384	REF	7	LAST 1403	16,2790	551472 0	TSNEXTP	TS	
A0385						STATF	LCGIC	

A0386
A0387
A0388
A0389
A0390

CHECK IN ORDER:
LFCPHASE
PULSES
DETENT (BIT15 CH31)
GO TO PURGENCY

IF ON
GO TO PURGENCY
MINIMUM PULSE LCGIC
RATE COMMAND

0391	REF	52	LAST 1401	16,2791	3 4727 0	CA	BIT13	CHECK STICK IF IN ATT. FCUR.
0392				16,2792	0 0006 1	EXTEND		
0393	REF	10	LAST 1419	16,2793	02 001 1	RAND	CHAN31	
0394				16,2794	0 0006 1	EXTEND		
0395	REF	1		16,2795	1 3127 0	PZF	MANMCCF	

0396	REF	39	LAST 1417	16,2796	3 0111 0	CA	DAPBCLLS	
0397	REF	2	LAST 903	16,2797	7 4743 1	MASK	XOVINHIB	
0398	REF	402	LAST 1419	16,2798	10 000 0	CCS	A	
0399	REF	1		16,2799	1 2467 0	TCF	PURGENCY	ATTITUDE STEER DURING VISIBILITY PHASE

0400	REF	1		16,2800	1 3071 0	TCF	DETENTICK	
0401	REF	2	LAST 730	16,2801	3 4725 1	CA	PULSES	PULSES IS ONE FOR PULSE MODE
0402	REF	39	LAST 1420	16,2802	7 0111 1	MASK	DAPBCLLS	

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0403				16,3021	0 0006 1	EXTEND		
0404	REF	2	LAST 1420	16,3032	1 3171 0	BZF	DEFECTCK	BRANCH FOR RATE COMMAND
0405	REF	293	LAST 1420	16,3033	3 4755 1	CA	ZERO	
0406	REF	4	LAST 1411	16,3034	551464 1	TS	PSEUDR	
R0407	MINIMUM IMPULSE MODE							
0408	REF	25	LAST 1411	16,3035	3 0032 0	CA	CDUX	
0409	REF	21	LAST 1411	16,3036	551635 1	TS	CDLXD	
0410	REF	2	LAST 1402	16,3037	111460 0	CCS	CLDPMIN	
0411	REF	1		16,3040	1 2054 1	TCF	CHECKP	
0412	REF	42	LAST 1409	16,3041	3 4751 0	CA	BIT3	FIRFP
0413				16,3042	0 0006 1	EXTEND		
0414	REF	11	LAST 1420	16,3043	02 031 1	RAND	CHANB1	
0415				16,3044	0 0106 1	EXTEND		
0416	REF	1		16,3045	1 3064 1	BZF	+XMIN	
0417	REF	57	LAST 1409	16,3046	3 4751 1	CA	BIT4	
0418				16,3047	0 0006 1	EXTEND		
0419	REF	12	LAST 1421	16,3050	02 031 1	RAND	CHANB1	
0420				16,3061	0 0006 1	EXTEND		
0421	REF	1		16,3052	1 3062 1	BZF	-XMIN	
0422	REF	1		16,3053	1 3446 0	TCF	JETSCFF	
0423				16,3054	0 0106 1	EXTEND		CHECKP
0424	REF	13	LAST 1421	16,3055	03 031 0	READ	CHANB1	
0425	REF	493	LAST 1420	16,3056	4 0100 0	CS	A	
0426	REF	5	LAST 1421	16,3057	7 5741 1	MASK	OCT14	
0427	REF	3	LAST 1421	16,3060	551460 0	TS	CLDPMIN	
0428	REF	2	LAST 1421	16,3061	1 3446 0	TCF	JETSCFF	
0429	REF	9	LAST 1402	16,3062	4 4363 1	CS	TEN	ANYTHING LESS THAN 14MS. CORRECTED
0430				16,3063	1 3065 0	TCF	+2	IN JET SELECTION ROUTINE
0431	REF	10	LAST 1421	16,3064	3 4363 0	CA	TEN	+XMIN
0432	REF	4	LAST 1401	16,3065	551524 1	TS	TJF	
0433	REF	156	LAST 1412	16,3066	3 4753 1	CA	ONE	
0434	REF	4	LAST 1421	16,3067	551460 0	TS	CLDPMIN	
0435	REF	1		16,3070	1 3354 1	TCF	PJETSLEC	-6

R0436 MANUAL RATE COMMAND MODE

R0437 =====

R0438 BY ROBERT F. STENGEL

R0439

R0440 THIS MODE PROVIDES PCAH MANUAL CONTROL THRU 2 CONTROL LAWS: 1) DIRECT RATE AND 2) PSEUDO-ALTC.
 R0442 THE DIRECT RATE MODE AFFORDS IMMEDIATE CONTROL WITHOUT OVERSHOOT. THE PSEUDO-ALTC MODE PROVIDES PRECISE
 R0444 RATE CONTROL AND ATTITUDE HOLD.
 R0445

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R0446 IN DIRECT RATE, JETS ARE FIRED WHEN STICK POSITION CHANGES BY A FIXED NUMBER OF INCREMENTS IN ONE DAP CYCLE.
 R0448 THE 'BREAKOUT LEVEL' IS .6 D/S FOR LM-ONLY AND .2 D/S FOR CSM-DOCKED. THIS LAW NULLS THE RATE ERROR TO WITHIN
 R0450 THE 'TARGET DEVIANCE', WHICH EQUALS THE BREAKOUT LEVEL.
 R0451 IN PSEUDO-AUTO, BODY-FIXED RATE AND ATTITUDE ERRORS ARE SUPPLIED TO TJETLAW, WHICH EXERCISES CONTROL.
 R0453 CONTROL SWITCHES FROM DIRECT RATE TO PSEUDO-AUTO IF THE TARGET DB IS ACHIEVED OR IF TIME IN (1) EXCEEDS 4 SEC.
 R0455 IF THE INITIAL COMMAND DOES NOT EXCEED THE BREAKOUT LEVEL, CONTROL GOES TO PSEUDO-AUTO IMMEDIATELY.
 R0457
 R0458
 R0461 SINCE P-AXIS CONTROL IS SEPARATE FROM Q,R AXES CONTROL, IT IS POSSIBLE TO USE (1) IN P-AXIS AND (2) IN Q,R AXES,
 R0462 OR VICE VERSA. THIS ALLOWS A DEGREE OF ATTITUDE HOLD IN UNCONTROLLED AXES. DUE TO U,V CONTROL, HOWEVER, Q AND
 R AXES ARE COUPLED AND MUST USE THE SAME CONTROL LAW.
 R0463
 R0464 HARD CONTROLLER COMMANDS ARE SCALED BY A LINEAR/QUADRATIC LAW. FOR THE LM-ALONE, MAXIMUM COMMANDED RATES ARE 20
 R0466 AND 4 D/S IN NORMAL AND FINE SCALING; HOWEVER, STICK SENSITIVITY AT ZERO COUNTS (OBTAINED AT A STICK DEFLECTION
 R0468 OF 2 DEGREES FROM THE CENTERED POSITION) IS .5 OR .1 D/S PER DEGREE. NORMAL AND FINE SCALINGS FOR THE CSM-DOCKED
 R0470 CASE IS AUTOMATICALLY SET TO 1/10 THE ABOVE VALUES. SCALING IS DETERMINED IN ROUTINE 3.
 R0472 ZEROENBL ENABLES COUNTERS SO THEY CAN BE READ NEXT TIME
 R0473 JUSTCUT FIRST DETECTION OF OUT OF DETENT (BY CURRCBIT)
 R0474
 R0475
 R0476 16,3071 0 0006 1 DETATCH EXTEND
 R0477 REF 14 LAST 1421 16,3072 0 0031 0 READ CHAN31
 R0478 REF 1 16,3073 55'443 1 TS CH31TEMP
 R0479 REF 50 LAST 1412 16,3074 7 4735 0 MASK BIT15 CHECK OUT-OF-DETENT BIT.
 R0480 16,3075 0 0006 1 EXTEND
 R0481 REF 1 16,3076 1 3226 0 BZF BRCMVCEC BRANCH IF CLT OF DETENT.
 R0482 REF 1 16,3077 3 4740 0 CAF CURRCBIT IN DETENT. CHECK THE RATE COMMAND BIT.
 R0483 REF 40 LAST 1420 16,3100 7 0111 1 MASK DAPBDOLS
 R0484 16,3101 0 0006 1 EXTEND
 R0485 REF 2 LAST 1420 16,3102 1 3467 0 BZF PURGENCY BRANCH IF NOT IN RATE COMMAND LAST PASS.
 R0486
 R0487 REF 32 LAST 1383 16,3103 3 4743 0 CA BIT9 JUST IN DETENT??
 R0488 REF 29 LAST 1420 16,3104 7 1262 1 MASK RCSEFLAGS
 R0489 16,3105 0 0006 1 EXTEND
 R0490 REF 1 16,3106 1 3127 0 BZF RLTH
 R0491 REF 53 LAST 1420 16,3107 3 4737 0 CAF BIT12 CHECK FOR ATTITUDE HOLD.
 R0492 16,3110 0 0006 1 EXTEND
 R0493 REF 15 LAST 1422 16,3111 02 031 1 RAND CHAN31
 R0494 16,3112 0 0006 1 EXTEND
 R0495 REF 1 16,3113 1 3223 0 BZF RATECAMP BRANCH IF IN ATTITUDE HOLD.
 R0496 REF 1 16,3114 4 5014 0 CS BIT5,11 IN ALTC.
 R0497 REF 31 LAST 1422 16,3115 7 1262 1 MASK RCSEFLAGS (X-AXIS OVERRIDE)
 R0498 REF 31 LAST 1422 16,3116 55'262 1 TS RCSEFLAGS 2EFC CRBIT (BIT 11) AND JUST-IN BIT (9).
 R0499 REF 2 LAST 1422 16,3117 1 3223 0 TCF RATECAMP
 R0500 REF 32 LAST 1422 16,3120 3 1262 0 RLTH CA RCSEFLAGS
 R0501 REF 1 16,3121 7 4742 0 MASK PB1T IN ATTITUDE HOLD.
 R0502 16,3122 0 0006 1 EXTEND
 R0503 16,3123 1 3125 0 BZF +2
 R0504 REF 3 LAST 1422 16,3124 1 3223 0 TCF RATECAMP BRANCH IF P-RATE DAMP INC IS FINISHED.

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0505	REF	32	LAST	1422	16,3125	2 1262 0	CA	RCSFLAGS
0506	REF	1			16,3126	7 4741 0	MASK	QRRIT
0507					16,3127	0 0006 1	EXTEND	
0508	REF	1			16,3130	1 3134 0	BZF	RATEDONE
0509	REF	4	LAST	1422	16,3131	1 3223 0	TCF	RATEDAMP

BRANCH IF G, R RATE DAMPING IS FINISHED.

=====								
0510	REF	60	LAST	1420	4753		1/10SEC	= BIT1
0511	REF	5	LAST	1361	4771		40CYC	= DCT50
0512					16,3132	74777 0	QRRBIT	DCT 74777
0513					5014		BIT59,11	EQUALS EBANK5
0514	REF	14	LAST	951	16,3133	00055 1	LIRATEP	DEC 46
0515								

=====								
0516	REF	2	LAST	1422	16,3134	4 4740 1	RATEDONE	CS QRRPCBIT
0517					16,3135	0 0014 0	INFINT	
0518	REF	41	LAST	1422	16,3136	7 0111 1	MASK	DAPBCOLS
0519	REF	42	LAST	1423	16,3137	54 111 1	TS	DAPBCOLS

MANUAL COMMAND AND DAMPING COMPLETED IN ALL AXES.

R0521 READ CCUS INTO CUL DESIRED REGISTERS

0522	REF	54	LAST	1422	16,3140	3 4737 0	CAF	BIT13
0523					16,3141	0 0016 1	EXTEND	
0524	REF	16	LAST	1422	16,3142	22 31 1	RAND	CHAN31
0525					16,3143	0 0116 1	EXTEND	
0526					16,3144	1 2151 1	BZF	+4
0527	REF	26	LAST	1421	16,3145	3 0032 0	CA	CDUX
0528	REF	21	LAST	1421	16,3146	55 635 1	TS	CDUXD
0529					16,3147	0 3152 1	TC	+3
0530	REF	54	LAST	1403	16,3151	0 4674 0	TC	IBKCALL
0531	REF	11	LAST	1401	16,3151	40154 0	FCADR	ZATTERCR
0532					16,3152	0 0003 1	REFINT	
0533	REF	3	LAST	1422	16,3153	1 3467 0	TCF	PURGENCY

(X-AXIS OVERRIDE)

0534	REF	5	LAST	1421	16,3154	55 464 1	TS	PEPRCR
0535	REF	3	LAST	1423	16,3155	3 4740 0	JUSTCLT	CA QRRPCBIT
0536	REF	43	LAST	1423	16,3156	26 111 1	ADS	DAPBCOLS
0537	REF	284	LAST	1421	16,3157	3 4755 1	CA	ZERC
0538	REF	5	LAST	1414	16,3160	55 446 1	TS	DZERRCR
0539	REF	6	LAST	1423	16,3161	55 447 0	TS	DZERRCR +1
0540	REF	4	LAST	1414	16,3162	55 450 0	TS	DYERRCR
0541	REF	5	LAST	1423	16,3163	55 451 1	TS	DYERRCR +1
0542	REF	4	LAST	1415	16,3164	55 452 1	TS	DZERRCR
0543	REF	5	LAST	1423	16,3165	55 453 0	TS	DZERRCR +1
0544	REF	2	LAST	1414	16,3166	55 454 1	TS	PLAST
0545	REF	2	LAST	1414	16,3167	55 455 0	TS	QLAST
0546	REF	2	LAST	1415	16,3170	55 456 0	TS	RLAST
0547	REF	1			16,3171	54 042 0	TS	Q-RHCCTR
0548	REF	1			16,3172	54 044 0	TS	R-RHCCTR
0549	REF	1			16,3173	3 3132 1	CA	QRRBIT
0550	REF	34	LAST	1423	16,3174	7 1262 1	MASK	RCSFLAGS
0551	REF	35	LAST	1423	16,3175	55 462 1	TS	RCSFLAGS

INITIALIZATION - FIRST MANUAL PASS.

BITS 10 AND 11 OF RCSFLAGS ARE 0.

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0552	RFF	36	LAST 1423	16,2176	4 1262 1	CS	PCSFLAGS	SET 'JUST-IN' BIT TO 1.
0553	RFF	33	LAST 1422	16,2177	7 4743 1	MASK	BIT9	
0554	RFF	37	LAST 1424	16,3210	27'262 1	ADS	PCSFLAGS	
0555	RFF	1		16,2211	0 3214 1	TC	ZEROENBL	
0555.1				16,3212	1 0003 1	RELINT		
0556	RFF	3	LAST 1421	16,3213	1 3446 0	TCF	JETSCEF	
0557	RFF	2	LAST 1423	16,3214	22'044 1	EXCH	R-RHCCTR	
0558	RFF	2	LAST 1423	16,3215	3 0142 1	CA	Q-RHCCTR	
0559	RFF	1		16,3216	53'463 0	EXCF	SAVEHAND	
0560	RFF	285	LAST 1423	16,3217	3 4755 1	CA	ZERO	
0561	RFF	1		16,3218	54 043 1	TS	P-RHCCTR	
0562	RFF	2	LAST 1424	16,3211	54 042 0	TS	Q-RHCCTR	
0563	RFF	3	LAST 1424	16,3212	54 044 0	TS	R-RHCCTR	
0563.05				16,3213	0 0004 0	INFINT		
0563.1				16,3214	0 0006 1	EXTEND		
0563.2	RFF	6	LAST 1394	16,3215	23'265 1	EXCF	C13QSAV	
0563.3	RFF	5	LAST 1394	16,3216	1 6022 1	TC	C13STALL	
0564	RFF	1		16,3217	3 3622 0	CA	RITS8,9	
0565				16,3220	0 0006 1	EXTEND		
0566	RFF	23	LAST 1394	16,3221	05 013 0	WOR	CHAN13	COUNTERS ZEROED AND ENABLED
0567	RFF	6	LAST 1424	16,3222	1 1265 1	TC	C13QSAV	
0568	RFF	286	LAST 1424	16,3223	3 4755 1	RATEDAMP	CA	ZERO
0569	RFF	2	LAST 1424	16,3224	54 043 1	TS	P-RHCCTR	
0570	RFF	1		16,3225	1 3232 0	TCF	RATERERR	
0571	RFF	4	LAST 1423	16,3226	2 4743 0	R-RHCCTR	CA	CLUPCFIT
0572	RFF	44	LAST 1423	16,3227	7 0111 1	MASK	DAPPECLS	F CONTROL
0573				16,3230	0 0006 1	EXTEND		
0574	RFF	1		16,3231	1 3154 0	BZF	JUSTFLT -1	
0575	RFF	27	LAST 1423	16,3232	3 0032 0	RATERERR	CA	CDUX
0576	RFF	22	LAST 1423	16,3233	55'635 1	TS	CDUXC	FINDCCUX REQUIRES THAT CDUXC=CDUX DURING X-AXIS OVERRIDE
0577	RFF	2	LAST 1424	16,3234	1 043 1	CCS	P-RHCCTR	
0578				16,3235	1 3241 0	TCF	+3	
0579				16,3236	1 3241 0	TCF	+2	
0580				16,3237	1 3241 0	TCF	+1	
0581				16,3240	6 0000 1	DOUBLE		LINEAR/QUADRATIC CONTROLLER SCALING
0582				16,3241	6 0000 1	DOUBLE		(SEE EXPLANATION IN Q,R-AXES RCS AUTOPILOT)
0583	RFF	1		16,3242	6 3133 0	AD	LINRATE	
0584				16,3243	0 0006 1	EXTEND		
0585	RFF	4	LAST 1424	16,3244	7 0143 1	MP	P-RHCCTR	
0586	RFF	278	LAST 1414	16,3245	3 0001 0	CA	L	
0587				16,3246	0 0006 1	EXTEND		
0588	RFF	6	LAST 295	16,3247	7 1444 0	MP	STIKSENS	
0589	RFF	3	LAST 1423	16,3250	57'454 0	XCF	PLAST	
0590				16,3251	4 0000 0	CCM		
0591	RFF	4	LAST 1424	16,3252	6 1454 0	AD	PLAST	
0592	RFF	25	LAST 1416	16,3253	55'737 1	TS	CAPTEMP1	
0593	RFF	2	LAST 1424	16,3254	1 3234 1	TC	ZEROENBL	INTERVAL. ZERO AND ENABLE ACA COUNTERS.

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05931 16,3255 0 0003 1
 0594 RFF 5 LAST 1424 16,3256 4 1454 1
 0595 RFF 15 LAST 1415 16,3257 6 1421 1
 0596 RFF 1 16,3260 551427 0
 0597 RFF 26 LAST 1424 16,3261 111737 1
 0598 16,3262 1 3265 1
 0599 16,3263 1 3273 0
 0600 16,3264 1 3265 1
 0601 RFF 5 LAST 295 16,3265 6 1475 0
 0602 16,3266 0 0006 1
 0603 16,3267 6 3273 1
 0604 RFF 1 16,3270 2 4771 1
 0605 RFF 2 LAST 1412 16,3271 551445 1
 0606 RFF 1 16,3272 0 3304 0
 0607 RFF 38 LAST 1424 16,3273 3 1262 0
 0608 RFF 2 LAST 1422 16,3274 7 4742 0
 0609 16,3275 0 0006 1
 0610 16,3276 1 3200 0
 0611 RFF 2 LAST 1425 16,3277 1 3304 0
 0612 RFF 7 LAST 1423 16,3300 3 1446 0
 0613 RFF 1 16,3301 551752 1
 0614 RFF 6 LAST 1423 16,3302 551464 1
 0615 RFF 4 LAST 1423 16,3303 1 2473 1
 0616 RFF 28 LAST 1424 16,3304 3 0132 0
 0617 RFF 23 LAST 1424 16,3305 551635 1
 0618 RFF 287 LAST 1424 16,3306 3 4755 1
 0619 RFF 8 LAST 1425 16,3307 551446 1
 0620 RFF 9 LAST 1425 16,3310 551447 0
 0621 RFF 7 LAST 1425 16,3311 551464 1
 0622 RFF 2 LAST 1425 16,3312 111427 0
 0623 16,3313 0 3316 0
 0624 16,3314 1 3316 0
 0625 16,3315 0 3316 0
 0626 RFF 1 16,3316 551737 1
 0627 RFF 1 16,3317 6 1476 0
 0628 16,3320 0 0006 1
 0629 RFF 1 16,3321 6 3331 0
 0630 RFF 3 LAST 1425 16,3322 3 1445 0
 0631 16,3323 0 0006 1
 0632 RFF 2 LAST 1425 16,3324 6 3331 0
 0633 RFF 35 LAST 1425 16,3325 4 1262 1
 0634 RFF 3 LAST 1425 16,3326 7 4742 0
 0635 RFF 40 LAST 1425 16,3327 271262 1
 0636 16,3330 1 3234 1
 0637 RFF 4 LAST 1425 16,3331 4 4742 0
 0638 RFF 41 LAST 1425 16,3332 7 1262 1
 0639 RFF 42 LAST 1425 16,3333 551262 1
 0640 RFF 3 LAST 1425 16,3334 4 1427 0
 0641 16,3335 0 0006 1
 0642 RFF 1 16,3336 7 1551 0

RELINT

CS PLAST
 AD DMGAP
 TS FCCTF
 CCS DAPTEMP1
 TCF +3
 TCF +8
 TCF +1
 AC -RATECP
 EXTEND
 BZMF +4
 CA 40CYC
 TS TCP
 TC PEC1
 CA RCSFLAGS
 MASK PBIT
 EXTEND
 BZF +2
 TC PEC1
 CA DXERRCP
 TS F
 TS PERRRR
 TC PLRAGENCY +4
 CA CDUX
 TS CDUXF
 CA ZERP
 TS DXEPPCR
 TS DXEPPCR +1
 TS PERRRR
 CCS EDOTP
 TC +3
 TC +2
 TC +1
 TS ABSECCTF
 AD TARGETDB
 EXTEND
 BZMF LAST
 CA TCP
 EXTEND
 BZMF LAST
 CS RCSFLAGS
 MASK PBIT
 ADS RCSFLAGS
 TCF +4
 CS PBIT
 MASK RCSFLAGS
 TS RCSFLAGS
 CS EDOTP
 EXTEND
 MP 1/ANETP

IF P COMMAND CHANGE EXCEEDS BREAKOUT
LEVEL, GO TO DIRECT RATE CONTROL. IF ACT
CHECK FOR DIRECT RATE CONTROL LAST TIME.

CHECK FOR DIRECT RATE COMMAND LAST TIME.

TC PURE RATE COMMAND
 PSEUDOC-AUTOC CONTROL.
 X-ATTITUDE ERROR (SP)
 LOAC P-AXIS ERROR FOR MODE1 FCAI DISPLAY
 DIRECT RATE CONTROL.

ZERP P-AXIS ERROR FOR MODE1 FCAI DISPLAY

IF RATE ERROR IS LESS THAN DEADBAND,
FIRE, AND SWITCH TO PSEUDOC-AUTOC.

IF TIME IN RATE COMMAND EXCEEDS 4 SEC.,

BIT 10 IS 1.

BIT 10 IS 0.

1/2JTACC SCALED AT 2EXP(7)/PI

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0643 REF 454 LAST 1421 16,3337 20 001 1
 0644 REF 10 LAST 1417 16,3340 0 2310 1
 0645 16,3341 0 0006 1
 0646 REF 1 16,3342 7 7721 0
 0647 REF 5 LAST 1421 16,3343 55 524 1
 0648 REF 2 LAST 1425 16,3344 3 1737 0
 0649 REF 2 LAST 1421 16,3345 6 1475 0
 0650 16,3346 0 0006 1
 0651 16,3347 6 3352 0

CAS A
 TC OVERSLB
 EXTEND
 MP 25/32
 TS TJP
 CA ABSEDDTP
 AD -2JETIIM
 EXTEND
 PZMF +3

A CONTAINS TJET SCALED AT 2EXP(4)(16/25)
 4. JET TIME

COMPARING DELTA RATE WITH 2 JET LIMIT

0652 REF 30 LAST 1419 16,3350 3 6245 1
 0653 16,3351 1 3361 1
 0654 REF 6 LAST 1426 16,3352 3 1524 0
 0655 REF 7 LAST 1426 16,3353 27 524 1
 A0656

CA SIX
 TCF +ED
 CA TJP
 ADS TJP

GOES TO PJETSLEC FOR TWO JETS

A0657 P-JET-SELECTION-ROUTINE (ROTATION)

A0658 INPUT: NUMBERT 4,5,6 FOR WHICH PAIR OR 4 JETS
 A0659 TJP + FOR +P ROTATION

A0660 CUTPLT: CHANNEL 6
 A0661 PJUMPADR FOR P-AXIS SKIP
 A0662 (JTLST CALL) (SMALL TJP)

A0663 ORDER OF POLICIES TRIED IN CASE OF FAILURE.

A0664 +P -P
 A0665 7,15 8,16
 A0666 4,12 3,11
 A0667 4,7 8,11
 A0668 7,12 11,16
 A0669 12,15 3,16
 A0670 4,15 3,8
 A0671 ALARM ALARM

0672 REF 1 16,3354 3 4747 1
 0673 REF 21 LAST 1328 16,3355 7 0101 0
 0674 REF 495 LAST 1426 16,3356 10 000 0
 0675 REF 157 LAST 1421 16,3357 3 4753 1
 0676 REF 34 LAST 1420 16,3360 6 4751 0
 0677 REF 3 LAST 1420 16,3361 55 743 1
 0678 REF 158 LAST 1426 16,3362 3 4753 1
 0679 REF 279 LAST 1424 16,3363 54 301 1
 0680 REF 8 LAST 1426 16,3364 11 524 1
 0681 16,3365 1 2372 0
 0682 REF 4 LAST 1424 16,3366 1 3446 0
 0683 16,3367 1 3371 0
 0684 REF 5 LAST 1426 16,3370 1 3446 0
 0685 16,3371 22 17 0
 0686 REF 159 LAST 1426 16,3372 6 4753 1
 0687 REF 1 16,3373 55 737 1

CA ADRBSYST
 MASK FLAGWRDS
 CCS A
 CA CNF
 AD FCUR
 TS NUMBPT
 PJETSLEC CA CNF
 TS L
 CCS TJP
 TCF +5
 TCF JETSCFF
 TCF +2
 TCF JETSCFF
 ZL
 AD CNF
 TS ABSTJ

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0688	REF	4	LAST 1420	16,3374	23'744 1	LXCH	RCINDEX	
0689	REF	1		16,3375	0 3535 1	TC	SELECTP	
0690	REF	21	LAST 1426	16,3376	4 6245 0	CS	SIX	
0691	REF	4	LAST 1426	16,3377	6 1743 0	AD	NUMBER	
0692				16,3400	0 0706 1	EXTEND		
0693				16,3401	1 3403 1	BZF	+2	
0694	REF	95	LAST 1409	16,3402	4 4752 1	CS	TWC	
0695	REF	35	LAST 1426	16,3403	6 4751 0	AD	FOUP	
0696	REF	2	LAST 134	16,3404	55'521 1	TS	NO. PJETS	
0697	REF	2	LAST 1426	16,3405	2 1741 1	CA	POLYTEMP	
0698	REF	2	LAST 1394	16,3406	0 5744 0	TC	WRITEP	
0699	REF	2	LAST 1426	16,3407	4 1737 1	CS	ABSTJ	
0700	REF	1		16,3410	6 3616 0	AD	+150MST6	
0701				16,3411	0 0006 1	EXTEND		
0702	REF	2	LAST 1419	16,3412	6 3630 1	BZMF	CRAXIS	CC TO CRAXIS CR TC GTS.
0703	REF	1		16,3413	6 3576 0	AD	-136MST6	
0704				16,3414	0 0006 1	EXTEND		
0705				16,3415	6 2422 0	BZMF	+5	
0706	REF	3	LAST 1427	16,3416	27'737 1	ADS	ABSTJ	
0707	REF	5	LAST 1427	16,3417	51'744 1	INDEX	RCINDEX	
0708	REF	1		16,3420	3 3625 0	CA	MINTIMES	
0709	REF	5	LAST 1426	16,3421	55'524 1	TS	TJP	
0710	REF	4	LAST 1427	16,3422	2 1737 0	CA	ABSTJ	
0711				16,3423	22 007 0	ZL		
0712				16,3424	0 0014 0	IN-INT		
0713	REF	4	LAST 1402	16,3425	52'471 0	DXCH	T6FLRTHA	
0714	REF	55	LAST 1423	16,3426	0 4674 0	TC	IBNKCALL	
0715	REF	1		16,3427	37143 0	CACR	JTLST	
0716	REF	39	LAST 1419	16,3430	4 4740 1	CS	BIT12	
0717	REF	42	LAST 1425	16,3431	7 1262 1	MASK	PCSFALGS	
0718	REF	44	LAST 1427	16,3432	55'262 1	TS	RCSFALGS	EIT 12 SET TC 0.
0719	REF	1		16,3433	0 3435 0	TC	ALTSYST	
0720	REF	3	LAST 1427	16,3434	1 3630 0	TCF	GRAXIS	
0721	REF	32	LAST 1426	16,3435	3 0101 1	ALTSYST	CA	FLAGWRD5
0722	REF	280	LAST 1426	16,3436	54 001 1	TS	L	ALTERNATE P-AXIS JETS
0723	REF	2	LAST 1426	16,3437	2 4747 1	CA	ACRBSYST	
0724				16,3440	0 0006 1	EXTEND		
0725	REF	19	LAST 1404	16,3441	06 001 0	RXCR	LOHAN	
0726	REF	33	LAST 1427	16,3442	54 101 0	TS	FLAGWRD5	
0727				16,3443	0 0013 1	RELINT		
0728	REF	405	LAST 1413	16,3444	0 0012 0	TC	C	
0729	REF	2	LAST 1427	16,3445	0 3426 0	DKALT	TC	ALTSYST
0730	REF	3	LAST 1427	16,3446	0 5743 1	JETSCFF	TC	WRITEP -1

L P-AXIS RCS AUTOPILOT

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0731 RFF 288 LAST 1425 16,3447 3 4755 1 CA ZERO
 0732 RFF 10 LAST 1427 16,3450 551524 1 TS TJP
 0733 RFF 4 LAST 1427 16,3451 1 3630 0 TCF GRAXIS
 R0734 (NOTE -- M13 = 1 IDENTICALLY IMPLIES NULL MULTIPLICATION.)

0735 RFF 13 LAST 1411 16,3452 3 0033 1 CALCPERR CA CCUY
 0736 RFF 10 LAST 1411 16,3453 0 0006 1 EXTEND
 0737 RFF 7 LAST 1411 16,3454 211636 1 MSU CCUYD
 0738 RFF 10 LAST 1411 16,3455 0 0006 1 EXTEND
 0739 RFF 9 LAST 1412 16,3456 7 1414 0 MP M11
 0740 RFF 2 LAST 1425 16,3457 571752 0 XCF F
 0741 RFF 29 LAST 1425 16,3460 3 0032 0 CA CDUX
 0742 RFF 10 LAST 1411 16,3461 0 0006 1 EXTEND
 0743 RFF 24 LAST 1425 16,3462 211635 1 MSU CCUXD
 R0744 EXTEND
 R0745 MP M13
 0746 RFF 5 LAST 1398 16,3463 6 1274 1 AD DELPERR
 0747 RFF 3 LAST 1428 16,3464 271752 1 ADS F
 0748 RFF 8 LAST 1425 16,3465 571464 0 XCF PERRCR
 0749 RFF 406 LAST 1427 16,3466 3 0032 0 TC G

P-ERROR CALCULATION.

CDL VALUE - ANGLE DESIRED (Y-AXIS)

(CCUY-CCUYD)M11 SCALED AT PI RADIAN
 SAVE FIRST TERM (OF TWO)
 THIRD COMPONENT

CDL VALUE - ANGLE DESIRED (X-AXIS)

KALCMANU INTERFACE ERROR
 SAVE SUM OF TERMS. COULD BE OVERFLOW.
 SAVE P-ERROR FOR EIGHT-BALL DISPLAY.
 RETURN TO CALLER

R0750 P-AXIS FREQUENCY FUNCTION CALCULATION.

0751 RFF 2 LAST 1403 16,3467 0 3452 1 PURGENCY TC CALCPERR
 0752 RFF 12 LAST 1398 16,3471 4 1643 0 CS CMGAPD
 0753 RFF 16 LAST 1425 16,3471 6 1421 1 AD OMEGAP
 0754 RFF 4 LAST 1425 16,3472 551427 0 TS EDCCTP

CALCULATE P-AXIS ERRORS.

THIS CODING IS COMMON TO BOTH LM DAF AND
 SPS-PACKUP MODE.

EDCCTP = CMGAPD - OMEGAPD AT PI/4 RAD/SEC

0755 RFF 160 LAST 1426 16,3473 4 4753 0 CS ONE
 0756 RFF 2 LAST 133 16,3474 551505 1 TS AXISCTR
 0757 RFF 45 LAST 1424 16,3475 3 0111 0 CA DAPBCCIS
 0758 RFF 8 LAST 1415 16,3476 7 4737 1 MASK CSMDCKD
 0759 RFF 10 LAST 1411 16,3477 0 0006 1 EXTEND
 0760 RFF 1 16,3500 1 3511 0 BZF HEADTJFT
 0761 RFF 1 16,3511 0 0004 0 INHINT
 0762 RFF 56 LAST 1427 16,3512 0 4674 0 TC IBNKCALL
 0763 RFF 1 16,3512 42730 1 CADR SPSRCS
 0764 RFF 11 LAST 1428 16,3504 3 1524 0 CA TJP
 0765 RFF 1 16,3505 0 0006 1 EXTEND
 0766 RFF 1 16,3506 1 3445 0 RZF DKALT
 0767 RFF 1 16,3507 0 0003 1 RELINT
 0768 RFF 2 LAST 1421 16,3510 1 3354 1 TCF PJETSIFC -6
 0769 RFF 289 LAST 1428 16,3511 3 4755 1 CA ZERO
 0770 RFF 1 16,3512 551500 1 TS SENSETYP
 0771 RFF 1 16,3512 0 0004 0 INHINT
 0772 RFF 57 LAST 1428 16,3514 0 4674 0 TC IBNKCALL
 0773 RFF 1 16,3515 37314 1 CADR TJFTLAW
 0774 RFF 1 16,3516 0 0003 1 RELINT

IF CSMDCKD = 1, GO TO LOCKED RCS LOGIC

IF TJP = ZERO, CHANGE ACRESYST.

SELECT ACRESYST AND USE TWO JFTS

L P-AXIS RCS AUTOPILLOT

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0775	REF	1		16,3517	4 1741 0	CS	FIRFFCT
0776	REF	1		16,3520	6 3524 0	AD	-FOURDEG
0777				16,3521	7 0316 1	EXTEND	
0778	REF	3	LAST 1428	16,3522	6 2354 0	BZMF	PJFTSLEC -6
0779	REF	12	LAST 1428	16,3523	11 524 1	CCS	TJP
0780				16,3524	1 3526 1	TCF	+2
0781	REF	6	LAST 1426	16,3525	1 3446 0	TCF	JFTSCFF
0782	REF	1		16,3526	6 3533 1	AD	-160MST6
0783				16,3527	0 0006 1	EXTEND	
0784	REF	4	LAST 1429	16,3530	6 3354 0	BZMF	PJFTSLEC -6
0785	REF	32	LAST 1427	16,3531	3 6245 1	CA	SIX
0786	REF	5	LAST 1429	16,3532	1 3361 1	TCF	PJFTSLEC -1
0787				16,3533	77377 1	-160MST6 DEC	-256
0788				16,3534	76117 1	-FOURDEG DEC	-0.0888

L P-AXIS RCS AUTOPILOT

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P0789 JET POLICY CONSTRUCTION SUBROUTINE

A0790

INPUT: ROTINDEX, NLMBERT

A0791

OUTPUT: POLYTEMP (JET POLICY)

```

A0792 THIS SUBROUTINE SELECT A SUBSET OF THE DESIRED JETS WHICH HAS NO FAILURE
0793 REF 33 LAST 1429 16,3535 3 6245 1 SELECTP CA SIX
0794 REF 1 16,3536 55'742 0 TS TEMPNUM
0795 REF 5 LAST 1427 16,3537 51'743 0 INDEX NLMBERT
0796 REF 1 16,3540 3 3567 0 CA TYPEP
0797 REF 6 LAST 1427 16,3541 51'744 1 INDEX PCTINDEX
0798 REF 1 16,3542 7 3560 0 MASK JETSALL
0799 REF 3 LAST 1427 16,3543 55'741 0 TS POLYTEMP
0800 REF 6 LAST 212 16,3544 7 1260 0 MASK CHGMASK
0801 REF 496 LAST 1426 16,3545 10 700 0 CCS A
0802 16,3546 1 2550 0 TCF +2
0803 REF 407 LAST 1428 16,3547 0 00'2 0 TC Q
0804 REF 2 LAST 1430 16,3550 11'742 0 CCS TEMPNUM
0805 16,3551 1 3555 0 TCF +4
0806 REF 49 LAST 1420 16,3552 0 5567 0 TC ALARM
0807 16,3553 02003 0 CCT 02003
0808 REF 7 LAST 1429 16,3554 1 3446 0 TCF JETSCFF *****TCF ALARMJET *****
0809 REF 6 LAST 1430 16,3555 55'743 1 SELECTYZ TS NLMBERT
0810 REF 2 LAST 1427 16,3556 1 3536 0 TCF SELECTP +1
0811 REF 1 16,3557 1 2773 1 -1 TCF ABCRTYZ +2
0812 16,3560 00252 1 JETSALL CCT 00252
0813 16,3561 00125 1 CCT 00125 +F
0814 16,3562 00140 1 CCT 00140 -Y
0815 16,3563 00016 1 CCT 00016 -Z
0816 16,3564 00220 1 CCT 00220 +Y
0817 16,3565 00011 1 CCT 00011 +Z
0818 16,3566 00151 1 CCT 00151 +V
0819 16,3567 00146 1 TYPEP CCT 00146 -U
0820 16,3570 00226 1 CCT 00226 -V
0821 16,3571 00231 1 CCT 00231 +U
0822 16,3572 00151 1 CCT 00151 +V
0823 16,3573 00132 1 CCT 00132 1-3
0824 16,3574 00245 1 CCT 00245 2-4
0825 16,3575 00377 1 CCT 00377 ALL
0826 REF 2 LAST 1427 16,3576 INDXYZ = -136MST6
0827 16,3576 77445 1 -136MST6 DEC -218
0828 16,3577 00004 0 DEC 4
0829 16,3578 00002 0 DEC 2
0830 16,3579 07776 0 CCT 07776
0831 16,3582 00005 1 DEC 5
0832 16,3583 00011 1 DEC 9
0833 16,3584 00012 1 DEC 10
0834 16,3585 07776 0 CCT 07776
0835 16,3586 00003 1 DEC 3

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L P-AXIS RCS AUTOPILCT

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0836		16,3617	00010 0	DFC	8
0837		16,3618	00007 0	DEC	7
0838		16,3611	07776 0	OCT	07776
0839		16,3612	07776 0	CCT	07776
0840		16,3613	07776 0	OCT	07776
0841		16,3614	07776 0	OCT	07776
0842		16,3615	07776 0	CCT	07776
0843		16,3616	00360 1	+150MST6 DEC	240
0844		16,3617	07400 1	07400CCT CCT	07400

THESE INDEXES OF MASK JETSALL WILL
CHANGE THE INSTRUCTION AT SELECTP +4
TO BE TO JETSALL -1
ONLY USED FOR TRANSLATION FAILURE

R0845 T-JET LAW FIXED CONSTANTS

0846		16,3620	00266 0	NORMSCL OCT	266
0847		16,3621	74631 0	-100MS DEC	-0.1
0848		16,3622	06315 0	200MS DEC	.2
0849	REF 5 LAST 958	7721		25/32 =	PRIN31 (DEC .78125)
0850		16,3623	00600 1	BITSE,5 COTAL	00600
0851		16,3624	00632 0	1/40 DEC	.02500
0852		16,3625	77751 1	MINIMES DEC	-22
0853		16,3626	00026 0	DEC	22
0854	REF 2 LAST 1418	16,3627	02734 0	PSKIPATR CFNADR SKIPPAXS	

A0855 GCES TO G,P-AXES RCS AUTOPILCT

0856	REF 7 LAST 1398	16,3630	4 1645 0	GRAXIS CS	OMEGARD
0857	REF 8 LAST 1417	16,3631	6 1423 0	AF	OMEGAR
0858	REF 11 LAST 1426	16,3632	0 2310 1	TC	OVERSLB
0859	REF 2 LAST 131	16,3633	55'437 1	IS	EDCTR
0860	REF 7 LAST 1398	16,3634	4 1644 1	CS	OMEGAQD
0861	REF 13 LAST 1416	16,3635	6 1422 1	AD	OMEGAQ
0862	REF 12 LAST 1431	16,3636	0 2310 1	TC	OVERSLB
0863	REF 3 LAST 131	16,3637	55'436 0	IS	EDCTC
0864		16,3640	0 3306 1	EXTEND	
0865	REF 1	16,3641	3 3644 1	CCA	QFRRCALL
0866		16,3642	52 006 0	CTCB	

0867	REF 22 LAST 1417	16,3637		FRANK= ADCQ	
0868	REF 1	16,3643	02124 1	QFRRCALL 2CADR	CALLGERR
0868	REF 1	16,3644	36106 0		

L Q,R-AXES PCS AUTOFILET

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EO S4

0001 17,2124
0002 REF 3 LAST 1395 17,2124
0003 17,2124

BANK 17
SETLCC DAPS2
BANK

0004 REF 25 LAST 1425 16,1635

CBANK= CELXD

0005 REF 1

COUNT# 54/DAPQR

R0006

00061 REF 55 LAST 1423 17,2124 3 4737 0

00062 17,2125 0 0006 1

00063 REF 17 LAST 1422 17,2126 02 031 1

00064 REF 497 LAST 1430 17,2127 10 000 0

00065 17,2130 1 2135 0

0007 REF 46 LAST 1428 17,2131 4 0111 1

00071 REF 5 LAST 1424 17,2132 7 4740 1

00072 17,2133 0 0006 1

00073 REF 1 17,2134 1 2136 0

00074 REF 2 LAST 1403 17,2135 0 2655 0

CALLQERR CA BIT13
EXTEND
RANC CHAN31
CCS A
TCF +5
CS DAPROCCIS
MASK OLRRORBIT
EXTEND
BZF Q,PCRGTS
TC QERRCALC

CALCULATE Q,R ERRORS UNLESS THESE AXES
ARE IN MANUAL RATE COMMAND.

IN AUTO COMPUTE Q,R ERRORS
IN MANUAL RATE COMMAND?

IF SC BYPASS CALCULATION OF ERRORS.

R0008

0009 REF 2 LAST 1402 17,2136 11 631 0

0010 REF 1 17,2137 1 2636 1

0011 REF 1 17,2140 1 2623 0

0012 REF 290 LAST 1428 17,2141 3 4755 1

0013 REF 3 LAST 1432 17,2142 55 631 0

Q,PCRGTS CCS CTRCLER
TCF GTOGTS
TCF TRYGTS
PCS CAF ZERO
TS CTRCLER

CHECKSE CONTROL SYSTEM FOR THIS GAP PASS:
GTS (ALTERNATES WITH RCS WHEN DOCKED)
GTS IF ALLOWED, OTHERWISE RCS
RCS (TRYGTS MAY BRANCH TO HERE)

0014 REF 4 LAST 1431 17,2143 53 437 1

0015 REF 1 17,2144 0 3210 0

0016 REF 11 LAST 1414 17,2145 53 427 0

EXCH ECTG
TC RCT-TCUV
EXCH ENEGAL

A0017

X - TRANSLATION:

ACC18

A0019

A0020

A0021

INPUT: FITS 7,8 OF CH31 (TRANSLATION CONTROLLER)
ULLAGER
APSLAG, DRIFTBIT
ACC4CR2X, ACRTPLAN

A0022

A0023

OUTPUT: NEXTL, NEXTV CODES OF TRANSLATION FOR AFTER ROTATION
SENSETYP TELL ROTATION DIRECTION AND DESIRE

R0024

R0026

X-TRANS POLICIES ARE EITHER 4 JETS OR A DIAGONAL PAIR. IN 2-JET TRANSLATION THE SYSTEM IS SPECIFIED. A FAILURE
WILL OVERRIDE THIS SPECIFICATION. AN ALARM RESULTS WHEN NO POLICY IS AVAILABLE BECAUSE OF FAILURES.

0028 REF 43 LAST 1415 17,2146 3 4745 0

0029 17,2147 0 0006 1

0030 REF 18 LAST 1432 17,2150 02 031 1

0031 17,2151 0 0006 1

0032 REF 1 17,2152 1 2600 0

SENSECECT CA BIT7
EXTEND
RANC CHAN21
EXTEND
RZF +XCRLLGE

INPUT FITS OVERRIDE THE INTERNAL FITS
SENSETYP WILL ACT OPPOSE ANYTRANS

I. C, R-AXES RCS AUTOPILOT

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0033	REF	42	LAST	1355	17,2153	3 4744 1	CA	PIT8	
0034					17,2154	0 0006 1	EXTEND		
0035	REF	19	LAST	1432	17,2155	02 031 1	RAND	CHAN31	
0036					17,2156	0 0006 1	EXTEND		
0037	REF	1			17,2157	1 2231 1	BZF	-XTRANS	
0038	REF	3	LAST	735	17,2160	3 4746 0	CA	ULLAGER	
0039	REF	47	LAST	1432	17,2161	7 0111 1	MASK	DAPBCCLS	
0040	REF	498	LAST	1432	17,2162	10 000 0	CCS	A	
0041	REF	2	LAST	1432	17,2163	1 2202 0	TCF	+XCRULGE	
0042	REF	4	LAST	1402	17,2164	55 473 1	TS	NEXTL	STORE NULL TRANSLATION POLICIES
0043	REF	4	LAST	1403	17,2165	55 474 0	TS	NEXTV	
0047	REF	48	LAST	1432	17,2166	4 0111 1	CS	DAPBCCLS	BURNING OR DRIFTING?
0048	REF	4	LAST	1417	17,2167	7 4744 0	MASK	DRIFTBIT	
0049					17,2170	0 0006 1	EXTEND		
0050	REF	1			17,2171	1 2176 1	BZF	TSSENSE	
0051	REF	22	LAST	1374	17,2172	3 0106 0	CA	FLGWRD10	OPS (INCLUDING DOCKED) OR AFS?
0052	REF	14	LAST	857	17,2173	7 4737 1	MASK	AFSFLBIT	
0053	REF	499	LAST	1423	17,2174	10 000 0	CCS	A	
0054	REF	96	LAST	1427	17,2175	3 4752 0	CAF	TWO	FAVOR +X JETS DURING AN AFS BURN.
0055	REF	2	LAST	1428	17,2176	55 500 1	TS	SENSETYP	
0056	REF	1			17,2177	1 2232 1	TCF	QRCNTRL	
0057	REF	161	LAST	1428	17,2200	3 4753 1	+XCRULGE	CAF	ONE
0058	REF	36	LAST	1427	17,2201	6 4751 0	-XTRANS	AD	FCUR
0059	REF	7	LAST	1430	17,2202	55 744 0	TS	ROTINDEX	
0060	REF	7	LAST	1383	17,2203	6 7750 1	AD	NEGR	
00601	REF	3	LAST	1423	17,2204	55 500 1	TS	SENSETYP	FAVOR APPROPRIATE JETS DURING TRANS.
0061	REF	49	LAST	1433	17,2205	3 0111 0	CA	DAPBCCLS	
0062	REF	2	LAST	295	17,2206	7 4741 0	MASK	ACC4CR2X	
0063	REF	500	LAST	1433	17,2207	10 000 0	CCS	A	
0064	REF	1			17,2210	1 2352 0	TCF	TRANS4	
0065	REF	50	LAST	1432	17,2211	3 0111 0	CA	DAPBCCLS	
0066	REF	1			17,2212	7 4742 0	MASK	AORBTAN	
0067	REF	501	LAST	1432	17,2213	10 000 0	CCS	A	
0068	REF	162	LAST	1432	17,2214	3 4753 1	CA	ONE	THREE FOR B
0069	REF	97	LAST	1433	17,2215	6 4752 0	AD	TWO	TWO FOR A SYSTEM 2 JET X TRANS
0070	REF	7	LAST	1420	17,2216	55 743 1	TSALVERT	TS	NUMPERT
0071	REF	1			17,2217	0 2225 1	TC	SELECTSUB	
0072	REF	4	LAST	1430	17,2220	11 741 0	CCS	PCLYTEMP	
0073					17,2221	1 2224 0	TCF	+3	
0074	REF	50	LAST	1430	17,2222	0 5567 0	TC	ALARM	
0075					17,2223	0202 1	CCT	02002	
0076	REF	3	LAST	1395	17,2224	3 5764 1	CA	00314CCT	
0077	REF	5	LAST	1433	17,2225	7 1741 0	MASK	POLYTEMP	
0078	REF	5	LAST	1433	17,2226	55 473 1	TSNEXTS	TS	NXTU

L Q,P-AXES RCS AUTOPILOT

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0079 PFF 4 LAST 1433 17,2227 4 5764 0
 0080 RFF 6 LAST 1433 17,2230 7 1741 0
 0081 RFF 5 LAST 1433 17,2231 55'474 0

CS CC314CCT
 MASK PCLYTEMP
 TS NEXTV

A0082 Q,P-AXES RCS CONTROL MODE SELECTION

A0083 SWITCHES INDICATION WHEN SET

A0085 BIT13/CHAN31 AUTO, GO TO ATTITUDE
 A0086 PULSES MINIMUM IMPULSE MODE
 A0087 (OTHERWISE) RATE COMMAND/ATTITUDE HOLD MODE

0088 RFF 56 LAST 1432 17,2232 3 4737 0
 0089 17,2233 0 0036 1
 0090 RFF 20 LAST 1433 17,2234 02 031 1
 0091 RFF 502 LAST 1433 17,2235 10 000 0
 0092 RFF 1 17,2236 1 2710 1
 0093 RFF 3 LAST 1429 17,2237 3 4735 1
 0094 RFF 51 LAST 1433 17,2240 7 0111 1
 0095 17,2241 1 0006 1
 0096 RFF 1 17,2242 1 2354 0

GRCONTROL CA BIT13
 EXTEND
 RAND CHAN31
 CCS A
 TCF ATTITUDE
 CHKBIT10 CAF PULSES
 MASK DAPROCLS
 EXTEND
 BZF CHECKSTIK

CHECK MODE SELECT SWITCH.
 BITS INVERTED
 PULSES = 1 FOR MIN IMP USE OF RFC
 IN ATT-HOLD/RATE-COMMAND IF BIT10=0

P0097 MINIMUM IMPULSE MODE

0098 17,2243 0 0014 0
 0099 RFF 58 LAST 1428 17,2244 0 4674 0
 0100 RFF 12 LAST 1423 17,2245 40'154 0
 0101 RFF 251 LAST 1432 17,2246 3 4755 1
 0102 RFF 3 LAST 1405 17,2247 55'450 0
 0103 RFF 52 LAST 1415 17,2250 55'452 1
 0104 17,2251 0 0013 1

INHINT
 TC 18NKCALL
 CADR ZATTERCR
 CA ZERO
 TS REPROR
 TS REPROR
 RELINT

FOR DISPLAYS

0105 17,2252 0 0006 1
 0106 RFF 21 LAST 1434 17,2253 00 031 0
 0107 RFF 1 17,2254 55'737 1
 0108 RFF 2 LAST 1402 17,2255 11'461 1
 0109 RFF 1 17,2256 1 2300 1

EXTEND
 READ CHAN31
 TS TEMP31
 CCS CLQRMIN
 TCF CHECKIN

IS EQUAL TO DAPTEMP1

0110 RFF 2 LAST 1434 17,2257 3 1737 0
 0111 RFF 61 LAST 1423 17,2260 7 4752 0
 0112 17,2261 0 0005 1
 0113 RFF 1 17,2262 1 2304 0

FIFPGF CA TEMP31
 MASK BIT1
 EXTEND
 BZF +QMIN

0114 RFF 3 LAST 1434 17,2263 3 1737 0
 0115 RFF 52 LAST 1408 17,2264 7 4752 1
 0116 17,2265 0 0006 1
 0117 RFF 1 17,2266 1 2310 0

CA TEMP31
 MASK BIT2
 EXTEND
 BZF -QMIN

0118 RFF 4 LAST 1434 17,2267 3 1737 0
 0119 RFF 51 LAST 1402 17,2270 7 4747 0

CA TEMP31
 MASK BIT5

L Q,R-AXES CCS AUTOPILOT

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0120				17,2271	0 00 6 1		EXTEND	
0121	REF	1		17,2272	1 2314 1		RZF	+RMIN
0122	REF	5	LAST 1434	17,2273	3 1737 0		CA	TEMP31
0123	REF	66	LAST 1408	17,2274	7 4746 1		MASK	BIT6
0124				17,2275	0 00 16 1		EXTEND	
0125	REF	1		17,2276	1 2316 0		RZF	-RMIN
0126	REF	1		17,2277	1 2112 1		TCF	XTRANS
0127	REF	6	LAST 1435	17,2280	4 1737 1	CHECKIN	CS	TEMP31
0128	REF	1		17,2281	7 2251 0		MASK	OUT63
0129	REF	3	LAST 1434	17,2282	55 1461 1		TS	OLDQPMIN
0130	REF	2	LAST 1435	17,2283	1 3112 1		TCF	XTRANS
0131	REF	1		17,2284	3 2136 0	+QMIN	CA	14MS
0132	REF	2	LAST 1401	17,2285	55 1525 0		TS	TJU
0133	REF	2	LAST 1435	17,2286	4 3136 1		CS	14MS
0134	REF	1		17,2287	1 2320 1		TCF	MINQF
0135	REF	3	LAST 1435	17,2288	4 3136 1	-QMIN	CS	14MS
0136	REF	4	LAST 1435	17,2289	55 1525 0		TS	TJU
0137	REF	4	LAST 1435	17,2290	3 2136 0		CA	14MS
0138	REF	2	LAST 1435	17,2291	1 2320 0		TCF	MINQF
0139	REF	5	LAST 1435	17,2292	3 2136 0	+RMIN	CA	14MS
0140				17,2293	1 2317 1		TCF	+2
0141	REF	6	LAST 1435	17,2294	4 3136 1	-RMIN	CS	14MS
0142	REF	5	LAST 1435	17,2295	55 1525 0		TS	TJU
0143	REF	2	LAST 1401	17,2296	55 1526 0	MINQF	TS	TJU
0144	REF	1		17,2297	3 2350 0		CA	MINQF
0145	REF	1		17,2298	55 1477 0		TS	RETJADR
0146	REF	163	LAST 1433	17,2299	3 4753 1		CA	ONE
0147	REF	4	LAST 1435	17,2300	55 1461 1		TS	OLDQPMIN
0148	REF	3	LAST 1428	17,2301	55 1515 1	MINQF	TS	AXISCTR
0149	REF	52	LAST 1434	17,2302	3 0111 0		CA	DAPBCCLS
0150	REF	9	LAST 1428	17,2303	7 4727 1		MASK	CSNDCKC
0151				17,2304	0 00 16 1		EXTEND	
0152	REF	1		17,2305	1 2341 1		RZF	MINRET
0153	REF	4	LAST 1435	17,2306	51 1505 0		INDEX	AXISCTR
0154	REF	6	LAST 1435	17,2307	11 1525 0		CCS	TJU
0155	REF	1		17,2308	3 4776 0		CA	60MS
0156				17,2309	1 2337 0		TCF	+2
0157	REF	2	LAST 1435	17,2310	4 4776 1		CS	60MS
0158	REF	5	LAST 1435	17,2311	51 1505 0		INDEX	AXISCTR
0159	REF	7	LAST 1435	17,2312	55 1525 0		TS	TJU
0160	REF	53	LAST 1435	17,2313	3 0111 0	MINRET	CA	DAPBCCLS
0161	REF	2	LAST 1434	17,2314	7 4742 0		MASK	ACRSTRAN
0162	REF	513	LAST 1434	17,2315	10 00 10 0		CLS	A
0163	REF	164	LAST 1435	17,2316	3 4753 1		CA	CNE
0164	REF	98	LAST 1433	17,2317	6 4752 0		AD	TWC
0165	REF	8	LAST 1432	17,2318	55 1743 1		TS	NUMREPT

IF CCKEE,USE 60MS MINIMUM IMPULSE

```

0166 RFF 1 17,2347 1 2756 0 TCF AFTERBTJ
0167 RFF 2 LAST 255 4776 60MS = OCT140
0168 RFF 1 17,2350 02325 1 MINADR GENADR MINRTN
0169 17,2351 00063 1 OCT63 63
0170 RFF 1 17,3136 14MS = +TJMINT6
0171 RFF 37 LAST 1433 17,2352 3 4751 0 TRANS4 CA FCLR
0172 RFF 1 17,2353 1 2216 1 TCF TSNIMBPT

```

A0173

RATE COMMAND MODE:

A0174

DESCRIPTION (SAME AS P-AXIS)

```

0175 RFF 2 LAST 1402 17,2354 551633 1 CHECKSTK TS INGT5
0176 RFF 165 LAST 1435 17,2355 4 4753 0 CS ONF
0177 RFF 4 LAST 1432 17,2356 551631 0 TS CTRCLER
0178 RFF 51 LAST 1422 17,2357 3 4735 1 CA BIT15
0179 RFF 2 LAST 1422 17,2360 7 1443 1 MASK CH31TMP
0180 17,2361 0 0006 1 EXTEND
0181 RFF 1 17,2362 1 2377 1 BZF RHCATIV
0182 RFF 6 LAST 1432 17,2363 3 4740 0 CA DFCRBIT
0183 RFF 54 LAST 1435 17,2364 7 0111 1 MASK DAPBCCLS
0184 17,2365 0 0006 1 EXTEND
0185 RFF 1 17,2366 1 2710 1 BZF STILLRCS
0186 RFF 34 LAST 1424 17,2367 4 4743 1 CS BIT9
0187 RFF 45 LAST 1427 17,2370 7 1262 1 MASK RCSFLAGS
0188 RFF 46 LAST 1436 17,2371 551262 1 TS RCSFLAGS
0189 RFF 1 17,2372 1 2374 1 TCF DAMPING
0190 *RFF 6 LAST 1423 4771 40CYCL = OCT50
0191 RFF 62 LAST 1434 4753 1710S = BIT1
0192 17,2373 40056 1 LINRAT DFC 46
R0193 =====
0194 RFF 292 LAST 1434 17,2374 3 4755 1 DAMPING CA ZEPG
0195 RFF 2 LAST 1424 17,2375 551462 1 TS SAVFHAND
0196 RFF 2 LAST 1430 17,2376 551463 0 TS SAVFHAND +1
0197 RFF 4 LAST 1436 17,2377 111462 1 RHCATIV CCS SAVFHAND
0198 17,2400 1 2403 0 TCF +3
0199 17,2401 1 2403 0 TCF +2
0200 17,2402 1 2403 0 TCF +1
0201 17,2403 6 0000 1 DOUBLE
0202 17,2404 6 0000 1 DOUBLE
0203 RFF 1 17,2405 6 2373 1 AD LINPAT
0204 17,2406 0 0005 1 EXTEND
0205 RFF 5 LAST 1436 17,2407 7 1462 1 MP SAVFHAND
0206 RFF 281 LAST 1427 17,2410 3 0001 0 CA L
0207 17,2411 0 0006 1 EXTEND
0208 RFF 7 LAST 1424 17,2412 7 1444 0 MP STIKSENS
0209 RFF 3 LAST 1423 17,2413 571455 1 XCF QLAST
0210 17,2414 4 0000 0 COM

```

ACT IN GTS WHEN IN ATT HOLD
 1/ACCS WILL DO THE NULLING DRIVES
 COME BACK TO RCS NEXT TIME

BRANCH IF OUT OF DETENT.

IN DETENT CHECK FOR MANUAL CONTROL
 ***** LAST TIME.

BIT 9 IS 0.

G,R MANUAL CONTROL WC = A*(E+|C|)*C

WHERE

WC = COMMANDED ROTATIONAL RATE

A = QUADPATIC SENSITIVITY FACTOR

E = LINEAR/QUADPATIC SENSITIVITY

|C| = ABS. VALUE OF DEFLECTION

C = HAND CONTROLLER DEFLECTION

COMMAND Q RATE SCALED 45 DEG/SEC

L G,R-AXES RCS AUTOPILOT

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0211 RFF 4 LAST 1436 17,2415 6 1455 1
 0212 RFF 5 LAST 1414 17,2416 55'741 0
 0213 RFF 6 LAST 1436 17,2417 11'463 0
 0214 17,2420 1 2423 1
 0215 17,2421 1 2423 1
 0216 17,2422 1 2423 1
 0217 17,2423 6 0000 1
 0218 17,2424 6 0000 1
 0219 RFF 2 LAST 1436 17,2425 6 2373 1
 0220 17,2426 0 0006 1
 0221 RFF 7 LAST 1437 17,2427 7 1463 0
 0222 RFF 282 LAST 1436 17,2430 3 0001 0
 0223 17,2431 0 0006 1
 0224 RFF 8 LAST 1436 17,2432 7 1444 0
 0225 RFF 2 LAST 1423 17,2433 57'456 1
 0226 17,2434 4 0000 0
 0227 RFF 4 LAST 1437 17,2435 6 1456 1
 0228 RFF 3 LAST 134 17,2436 55'742 0
 0229 RFF 5 LAST 1437 17,2437 4 1455 0
 0230 RFF 14 LAST 1431 17,2440 6 1422 1
 0231 RFF 1 17,2441 55'436 0
 0232 RFF 5 LAST 1437 17,2442 4 1456 0
 0233 RFF 9 LAST 1431 17,2443 6 1423 0
 0234 RFF 1 17,2444 55'437 1
 0235 RFF 2 LAST 1437 17,2445 53'437 1
 0236 RFF 2 LAST 1432 17,2446 0 3200 0
 0237 RFF 1 17,2447 53'427 0
 0238 RFF 6 LAST 1437 17,2450 11'741 0
 0239 17,2451 0 2454 0
 0240 17,2452 0 2454 0
 0241 17,2453 0 2454 0
 0242 RFF 6 LAST 1425 17,2454 6 1476 0
 0243 17,2455 0 0006 1
 0244 17,2456 6 2460 1
 0245 RFF 1 17,2457 1 2476 1
 0246 RFF 4 LAST 1437 17,2460 11'742 0
 0247 17,2461 0 2464 0
 0248 17,2462 0 2464 0
 0249 17,2463 0 2464 0
 0250 RFF 7 LAST 1437 17,2464 6 1476 0
 0251 17,2465 0 0006 1
 0252 17,2466 6 2470 0
 0253 RFF 2 LAST 1437 17,2467 1 2476 1
 0254 RFF 47 LAST 1436 17,2470 3 1262 0
 0255 RFF 2 LAST 1423 17,2471 7 4741 0
 0256 17,2472 0 0006 1
 0257 17,2473 1 2475 1
 0258 RFF 3 LAST 1437 17,2474 1 2500 1
 0259 RFF 2 LAST 1436 17,2475 1 2710 1
 0260 RFF 1 17,2476 3 4771 1

AD QLAST
 TS DAPTEMP3
 CCS SAVEHAND +1
 TCF +3
 TCF +2
 TCF +1
 ECLBLE
 DOUBBLE
 AD LINRAT
 EXTEND
 MP SAVEHAND +1
 CA L
 EXTEND
 MP STIKSENS
 XCH PLAST
 CCM
 AD RLAST
 TS DAPTEMP4
 CS QLAST
 AD CMFGAG
 TS GRATEDIF
 CS RLAST
 AD CMFGAR
 TS BRATEDIF
 XCH GRATEDIF
 TC RCT-TCUV
 DXCH URATEDIF
 CCS DAPTEMP3
 TC +3
 TC +2
 TC +1
 AD -RATLDB
 EXTEND
 BZMF +2
 TCF ENTERLV -2
 CCS DAPTEMP4
 TC +3
 TC +2
 TC +1
 AD -RATLDB
 EXTEND
 BZMF +2
 TCF ENTERLV -2
 CA PCSFLAGS
 MASK GRBIT
 EXTEND
 BZMF +2
 TCF ENTERLV
 TCF STILLRCS
 CA 40CYCL

INTERVAL.

TRANSFORM RATES FROM G,R TO U,V AXES

CHECK IF Q COMMAND CHANGE EXCEEDS
BREAKOUT LEVEL. IF NCT, CHECK R.

BREAKOUT LEVEL EXCEEDED. DIRECT RATE.
R COMMAND BREAKOUT CHECK.

BREAKOUT LEVEL EXCEEDED. DIRECT RATE.
BREAKOUT LEVEL NOT EXCEEDED. CHECK FOR
DIRECT RATE CONTROL LAST TIME.

CONTINUE DIRECT RATE CONTROL.
PSUDC-ALTO CONTROL.

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0261	REF	2	LAST 1412	17,2477	55'457 1	TS	TCQR	
0262				17,2500	0 0034 0	ENTERLV	INHINT	DIRECT RATE CONTROL.
0263	REF	59	LAST 1434	17,2501	0 4674 0	TC	IBNKCALL	
0264	REF	13	LAST 1434	17,2502	40154 0	FCADR	ZATTEROR	
0265				17,2503	0 0003 1	RELIINT		
0266	REF	293	LAST 1436	17,2504	3 4755 1	CA	ZFRD	
0267	REF	6	LAST 1422	17,2505	55'450 0	TS	DYERRCR	
0268	REF	7	LAST 1436	17,2506	55'451 1	TS	DYERRCR +1	
0269	REF	6	LAST 1423	17,2507	55'452 1	TS	DZERRCR	
0270	REF	7	LAST 1436	17,2508	55'453 0	TS	DZERRCR +1	
0271	REF	2	LAST 1437	17,2511	11'426 1	CCS	VRATEDIF	
0272				17,2512	1 2515 0	TCF	+3	
0273				17,2513	1 2515 0	TCF	+2	
0274				17,2514	1 2515 0	TCF	+1	
0275	REF	2	LAST 1425	17,2515	6 1476 0	AD	TARGETCE	IF TARGET CE IS EXCEEDED, CONTINUE
0276				17,2516	0 0206 1	EXTEND		DIRECT RATE CONTROL.
0277	REF	1		17,2517	6 2533 0	BZMF	VCB	
0278	REF	1		17,2520	11'427 0	CCS	VRATEDIF	
0279				17,2521	1 2524 1	TCF	+3	
0280				17,2522	1 2524 1	TCF	+2	
0281				17,2523	1 2524 1	TCF	+1	
0282	REF	2	LAST 1438	17,2524	5 1476 0	AD	TARGETDB	
0283				17,2525	0 0116 1	EXTEND		
0284				17,2526	6 2530 0	BZMF	+2	
0285	REF	1		17,2527	1 2544 1	TCF	QRTIME	
0286	REF	294	LAST 1438	17,2530	3 4755 1	CA	ZFRD	
0287	REF	2	LAST 1438	17,2531	55'427 0	TS	VRATEDIF	
0288	REF	2	LAST 1436	17,2532	1 2544 1	TCF	QPTIME	
0289	REF	3	LAST 1436	17,2533	11'427 0	CCS	VRATEDIF	
0290				17,2534	0 2537 1	TC	+3	
0291				17,2535	0 2537 1	TC	+2	
0292				17,2536	0 2537 1	TC	+1	
0293	REF	4	LAST 1436	17,2537	6 1476 0	AD	TARGETDB	IF TARGET DB IS EXCEEDED, CONTINUE
0294				17,2540	0 0006 1	EXTEND		DIRECT RATE CONTROL. IF NOT, FIRE AND
0295	REF	1		17,2541	6 2553 0	BZMF	TCPSELDC	SWITCH TO PSFLDC-AUTC CONTROL ON NEXT
0296	REF	295	LAST 1436	17,2542	3 4755 1	CA	ZFRD	PASS.
0297	REF	2	LAST 1436	17,2543	55'426 1	TS	VRATEDIF	
0298	REF	3	LAST 1438	17,2544	3 1457 0	QPTIME	CA	DIRECT RATE TIME CHECK.
0299				17,2545	0 0006 1	EXTEND		
0300				17,2546	6 2553 0	BZMF	+5	BRANCH IF TIME EXCEEDS 4 SEC.
0301	REF	48	LAST 1437	17,2547	4 1262 1	CS	RCSEFLAGS	
0302	REF	3	LAST 1437	17,2550	7 4741 0	MASK	GRBIT	
0303	REF	49	LAST 1438	17,2551	27'262 1	ADS	RCSEFLAGS	BIT 11 IS 1.
0304				17,2552	0 2555 0	TC	+4	
0305	REF	4	LAST 1436	17,2553	4 4741 0	CS	GRBIT	
0306	REF	50	LAST 1438	17,2554	7 1262 1	MASK	RCSEFLAGS	
0307	REF	51	LAST 1436	17,2555	55'262 1	TS	RCSEFLAGS	BIT 11 IS 0.
0308	REF	1		17,2556	3 2622 0	CA	HANDADR	
0309	REF	2	LAST 1435	17,2557	55'477 0	TS	PETJADR	
0310	REF	166	LAST 1436	17,2560	3 4753 1	CA	CNF	

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0311	REF	6	LAST 1435	17,2561	55'505 1	BACKHAND TS	AXISCTR				
0312	REF	38	LAST 1436	17,2562	3 4751 0	CA	FCUR				
0313	REF	9	LAST 1435	17,2563	55'743 1	TS	NUMBERT				
0314	REF	7	LAST 1435	17,2564	51'505 0	INDEX	AXISCTR				
0315	REF	3	LAST 1432	17,2565	51'535 0	INDEX	SKIPL				
0316				17,2566	1 2567 0	TCF	+1				
0317	REF	35	LAST 1435	17,2567	3 4751 0	CA	FCUR				
0318	REF	8	LAST 1439	17,2570	51'505 0	INDEX	AXISCTR				
0319	REF	4	LAST 1435	17,2571	55'535 1	TS	SKIPU				
0320	REF	1		17,2572	1 2034 1	TCF	LCCPER				
0321	REF	9	LAST 1439	17,2573	51'505 0	INDEX	AXISCTR				
0322	REF	4	LAST 1438	17,2574	11'426 1	CCS	URATECIF	INDEX	AXIS QUANTITY		
0323	REF	296	LAST 1438	17,2575	3 4755 1	CA	ZERO	0	-U 1/JETACC+ACSV		
0324				17,2576	1 2600 1	TCF	+2	1	+U 1/JETACC+ACSV		
0325	REF	167	LAST 1438	17,2577	3 4753 1	CA	CNF	16	-V 1/JETACC+ACSV		
0326	REF	10	LAST 1439	17,2601	51'505 0	INDEX	AXISCTR	17	+V 1/JETACC+ACSV		
0327	REF	1		17,2601	6 3755 0	AD	AXISCIF	JETACC = 2 JFT ACCELERATION (1 FOR FAIL)			
0328	REF	504	LAST 1435	17,2602	50 000 1	INDEX	A				
0329	REF	1		17,2603	4 1571 1	CS	1/ANFT2 +1				
0330				17,2604	00 000 1	EXTEND					
0331	REF	11	LAST 1435	17,2605	5 1505 0	INDEX	AXISCTR	URATECIF IS SCALED AT F1/4 RAD/SEC			
0332	REF	5	LAST 1439	17,2606	7 1426 1	MP	URATECIF	JET TIME IN A SCALED 32 SEC			
0333	REF	408	LAST 1430	17,2607	54 002 1	TS	G				
0334	REF	505	LAST 1435	17,2610	20 001 1	OAS	A				
0335	REF	409	LAST 1439	17,2611	6 0002 0	AD	Q				
0336	REF	506	LAST 1435	17,2612	54 000 1	TS	A	OVERFLOW SKIP			
0337				17,2613	1 2615 0	TCF	+2				
0338	REF	410	LAST 1435	17,2614	3 0002 0	CA	G	RIGHT SIGN AND BIGGER THAN 150MS			
0339	REF	12	LAST 1435	17,2615	51'505 0	SETTIME	INDEX	AXISCTR			
0340	REF	8	LAST 1435	17,2616	55'525 0	TS	TJU	SCALED AT 10.67 WHICH IS CLOSE TO 10.24			
0341	REF	2	LAST 1436	17,2617	1 2756 0	TCF	AFTERTJ				
0342	REF	297	LAST 1439	17,2620	3 4755 1	ZEPOTJ	CA	ZERO			
0343	REF	1		17,2621	1 2615 0	TCF	SETTIME				
0344	REF	1		17,2622	02561 1	HANDACR	GFNADP	BACKHAND			
A0345						GTS WILL BE TRIED IF					
A0346						1. USEGRJTS= 0,					
A0347						2. ALLOWGTS POS,					
A0348						3. JETS ARE OFF(Q,R-AXES)					
0349	REF	4	LAST 858	17,2623	3 4736 1	TRYGTS	CAF	USEGRJTS	IS JET USE MANDATORY.		
0350	REF	55	LAST 1436	17,2624	7 0111 1		MASK	DAPBCCLS	(AS LONG AS		
0351	REF	507	LAST 1439	17,2625	10 000 0		CCS	A	USEGRJTS BIT IS ACT BIT 15, CCS IS SAFE)		
0352	REF	1		17,2626	1 2141 0		TCF	RCS			
0353	REF	2	LAST 1432	17,2627	11'502 0		CCS	ALLOWGTS	NO. CCS ACSTASK OK CONTROL FOR GTS?		

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0354				17,2630	1 2632 0	TCF	+2
0355	REF	2	LAST 1439	17,2631	1 2141 0	TCF	RCS
0356				17,2632	0 0006 1	EXTEND	
0357	REF	6	LAST 1403	17,2633	00 005 1	READ	CHANS
0358	REF	508	LAST 1439	17,2634	10 000 0	CCS	A
0359	REF	1		17,2635	1 2641 1	TCF	CHKINCTS
0360				17,2636	0 0006 1	EXTEND	
0361	REF	1		17,2637	3 2654 1	CCA	GTSCACR
0362				17,2640	52 006 0	DTCP	
0363	REF	3	LAST 1436	17,2641	11 633 1	CHKINCTS	CCS
0364				17,2642	1 2644 1	TCF	+2
0365	REF	3	LAST 1440	17,2643	1 2141 0	TCF	RCS
0366				17,2644	0 0004 0	INFINT	
0367	REF	60	LAST 1438	17,2645	0 4674 0	TC	IPAKCALL
0368	REF	1		17,2646	42221 0	CADR	TIMEGWBL
0369				17,2647	0 0003 1	RFLINT	
0370	REF	298	LAST 1439	17,2650	2 4755 1	CAF	ZFRQ
0371	REF	4	LAST 1440	17,2651	55 633 1	TS	INGTS
0372	REF	4	LAST 1440	17,2652	1 2141 0	TCF	RCS
0373	REF	26	LAST 1432	17,2655		FBANK=	CDLXD
0374	REF	1		17,2653	03070 0	GTSCACR	ZCACR
0374	REF	1		17,2654	42106 0		GTS

WAS THE TRIM GIMBAL CONTROLLING
YES. SET UP A DAMPER NULLING DRIVE.
NO. NULLING WAS SET UP BEFORE. DO RCS

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P0275 SUBROUTINE TO COMPLETE Q,R-AXES ATTITUDE ERRORS FOR LSF IN THE RCS AND GTS CONTROL LAWS AND THE DISPLAYS.

0377	REF	14	LAST	142R	17,2655	30.033	1	QERRCALC	CAE	CDLY	Q-ERROR CALCULATION
0378					17,2656	0.0006	1		EXTEND		
0379	REF	8	LAST	142E	17,2657	21.636	1		MSL	CCUYD	CUY ANGLE - ANGLE DESIRED (Y-AXIS)
0380	REF	27	LAST	142S	17,2660	55.737	1		TS	DAPTEMP1	SAVE FOR RERRCALC
0381					17,2661	0.0006	1		EXTEND		
0382	REF	4	LAST	1414	17,2662	7.1415	1		MP	M21	(CCUY-CCUYD)*M21 SCALED AT PI RADIANS
0383	REF	4	LAST	142P	17,2663	55.752	1		TS	E	
0384	REF	17	LAST	1411	17,2664	30.034	0		CAE	CCUZ	SECOND TERM CALCULATION:
0385					17,2665	0.0006	1		EXTEND		
0386	REF	7	LAST	1412	17,2666	21.637	0		MSU	CDUZD	CDL ANGLE - ANGLE DESIRED (Z-AXIS)
0387	REF	9	LAST	1417	17,2667	55.740	1		TS	DAPTEMP2	SAVE FOR RERRCALC
0388					17,2670	0.0006	1		EXTEND		
0389	REF	7	LAST	1414	17,2671	7.1417	0		MP	M22	(CCUZ-CCUZD)*M22 SCALED AT PI RADIANS
0390	REF	3	LAST	139R	17,2672	6.1275	0		AD	DELQERRR	KALCMANU INTERFACE ERROR
0391	REF	5	LAST	1441	17,2673	6.1752	0		AD	E	
0392	REF	4	LAST	1434	17,2674	57.451	1		XCF	QERRCR	SAVE Q-ERROR FOR EIGHT-BALL DISPLAY.
0393	REF	28	LAST	1441	17,2675	21.737	0	RERRCALC	CAE	DAPTEMP1	P-ERROR CALCULATION:
0394					17,2676	0.0006	1		EXTEND		
0395	REF	4	LAST	1414	17,2677	7.1416	1		MP	M31	CDL ANGLE - ANGLE DESIRED (Y-AXIS)
0396	REF	6	LAST	1441	17,2709	55.752	1		TS	E	(CCUY-CCUYD)*M31 SCALED AT PI RADIANS
0397	REF	1	LAST	1441	17,2701	31.740	0		CAE	DAPTEMP2	SECOND TERM CALCULATION:
0398					17,2702	0.0006	1		EXTEND		
0399	REF	5	LAST	1414	17,2703	7.1421	1		MP	M32	CDL ANGLE - ANGLE DESIRED (Z-AXIS)
0400	REF	2	LAST	139R	17,2704	6.1276	0		AD	DELRRERR	(CCUZ-CCUZD)*M32 SCALED AT PI RADIANS
0401	REF	7	LAST	1441	17,2705	6.1752	0		AD	E	KALCMANU INTERFACE ERROR
0402	REF	4	LAST	1434	17,2706	57.452	0		XCF	RERRCP	SAVE R-ERROR FOR EIGHT-BALL DISPLAY.
0403	REF	411	LAST	143R	17,2707	0.0002	0		TC	Q	

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P0404 "ATTSTEER" IS THE ENTRY POINT FOR C,R-AXES (U,V-AXES) ATTITUDE CONTROL USING THE REACTION CONTROL SYSTEM

P0406 REF 3 LAST 1437 17,2710 ATTSTEER EQUALS STILLRCS "STILLRCS" IS THE RCS EXIT FROM TRYCTS.

P0407 REF 5 LAST 1441 17,2710 3 1452 0 STILLRCS CA REPRCR
 P0408 REF 509 LAST 1440 17,2711 22 000 1 LXCX A
 P0409 REF 5 LAST 1441 17,2712 3 1450 1 CA QERRRS
 P0410 REF 3 LAST 1437 17,2713 0 3200 0 TC RET-TRUV
 P0411 REF 2 LAST 132 17,2714 53 752 1 DXCH UERRCR

A0412 PREPARES CALL TO TJETLAW (OR SPSRCS (CHECKED))
 A0413 PREFCRMS SKIP LOGIC ON U OR V AXIS IF NEEDED.

P0414 REF 1 17,2715 3 3142 0 TJLAW CA TJLAWADR
 P0415 REF 3 LAST 1438 17,2716 55 477 0 TS RETJACR
 P0416 REF 168 LAST 1439 17,2717 3 4753 1 CA ONF
 P0417 REF 13 LAST 1439 17,2720 55 505 1 TS AXISCTR
 P0418 REF 14 LAST 1442 17,2721 51 505 0 INDEX AXISCTR
 P0419 REF 5 LAST 1439 17,2722 51 535 0 INDEX SKIPL
 P0420 REF 17,2723 1 2724 0 TCF +1
 P0421 REF 40 LAST 1439 17,2724 3 4751 0 CA FCUR
 P0422 REF 15 LAST 1442 17,2725 51 505 0 INDEX AXISCTR
 P0423 REF 6 LAST 1442 17,2726 55 535 1 TS SKIPL
 P0424 REF 2 LAST 1439 17,2727 1 2034 1 TCF LCCPR
 P0425 REF 16 LAST 1442 17,2731 51 505 0 INDEX AXISCTR
 P0426 REF 3 LAST 1442 17,2731 3 1751 0 CA UPRCR
 P0427 REF 8 LAST 1441 17,2732 55 752 1 TS F
 P0428 REF 17 LAST 1442 17,2733 51 505 0 INDEX AXISCTR
 P0429 REF 12 LAST 1432 17,2734 3 1426 0 CA CMEGAL
 P0430 REF 2 LAST 131 17,2735 55 427 0 TS FOOT
 P0431 REF 56 LAST 1439 17,2736 3 0111 0 CA DAPRCCLS
 P0432 REF 1 LAST 1435 17,2737 7 4737 1 MASK CSMDECKE
 P0433 REF 513 LAST 1442 17,2740 10 000 0 CCS A
 P0434 REF 17,2741 1 2744 0 TCF +3
 P0435 REF 2 LAST 1428 17,2742 0 2204 0 TC TJETLAW
 P0436 REF 3 LAST 1439 17,2743 1 2756 0 TCF AFTERFJ
 P0437 REF 57 LAST 1442 17,2744 4 0111 1 +3 CS DAPRCCLS
 P0438 REF 5 LAST 1439 17,2745 7 4736 0 MASK USEQRJTS
 P0439 REF 511 LAST 1442 17,2746 10 000 0 CCS A
 P0440 REF 5 LAST 1426 17,2747 55 621 0 TS COTRCLER
 P0441 REF 17,2750 0 0014 0 INFINIT
 P0442 REF 61 LAST 1440 17,2751 0 4674 0 TC IBKCALL
 P0443 REF 2 LAST 1428 17,2752 43730 1 CADR SPSRCS
 P0444 REF 17,2753 0 0003 1 RELINT
 P0445 REF 41 LAST 1442 17,2754 3 4751 0 CAF FCUR
 P0446 REF 11 LAST 1439 17,2755 55 743 1 TS NUMREPT

CHECKED. IF GMEAL USABLE DO GTS CONTROL
 ON THE NEXT PASS.
 USEQRJTS BIT MUST NOT BE BIT 15.
 GIMBAL USABLE. STORE POSITIVE VALUE.

DETERMINE RCS CONTROL

ALWAYS CALL FOR 2-JET CONTROL ABOUT U,V.
 FALL THROUGH TO JET SELECTION, ETC.

A0447 C,R-JET-SELECTION-LOGIC

A0448 INPUT: AXISCTR 0,1 FOR U,V
 A0449 SNUFFRIT ZERO TJETU,V AND TRANS. ONLY IF SET IN A CPS BURN

L Q,P-AXES RCS AUTOPILCT

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A0450 TJL,TJV JET TIME SCALED 10.24 SEC.
 A0451 NUMBER INDICATES NUMBER OF JETS AND TYPE OF POLICY
 A0452 RETJACR WHERE TO RETURN TO

A0453 OUTPLT: NO. L(V) JETS RATE DERIVATION FEEDBACK
 A0454 CHANNEL 5
 A0455 SKIPL, SKIPV FOR LESS THAN 15JMS FIRING

A0456 NOTES: IN CASE OF FAILURE IN DESIRED ROTATION POLICY, "ALL" UNFAILED
 A0457 JETS OF THE DESIRED POLICY ARE SELECTED. SINCE THERE ARE ONLY
 A0458 TWO JETS, THIS MEANS THE OTHER ONE OR NONE. THE ALARM IS SENT
 A0459 IF NONE CAN BE FOUND.

A0460 TIMES LESS THAN 14 MSEC ARE TAKEN TO CALL FOR A SINGLE-JET
 A0461 MINIMUM IMPULSE, WITH THE JET CHOSEN SEMI-RANDONLY.

0462	REF	24	LAST	1427	17,2756	3 0101 1	AFTERTJ	CA	FLAGWPS	IF SHUFFBIT SET DURING A CPS BURN EC TO
0463	REF	1			17,2757	7 4737 1		MASK	SHUFFBIT	XTRANS; THAT IS, IN-FLIGHT CONTROL.
0464					17,2760	0 0006 1		EXTEND		
0465	REF	1			17,2761	1 2772 0		BZF	DECRAT	
0466	REF	23	LAST	1433	17,2762	4 0106 1		CS	FIGWRD10	
0467	REF	15	LAST	1433	17,2763	7 4737 1		MASK	APSFLPIT	
0468					17,2764	0 0006 1		EXTEND		
0469	REF	2	LAST	1443	17,2765	1 2772 0		BZF	DECRAT	
0470	REF	58	LAST	1442	17,2766	3 0111 0		CA	DAFRCLLS	
0471	REF	5	LAST	1433	17,2767	7 4744 0		MASK	DRIFTEIT	
0472					17,2770	1 0006 1		EXTEND		
0473	REF	3	LAST	1435	17,2771	1 2112 1		BZF	XTRANS	
0474	REF	99	LAST	1435	17,2772	3 4752 0	DECRAT	CAF	TWO	
0475	REF	283	LAST	1437	17,2773	54 001 1		TS	L	
0476	REF	18	LAST	1442	17,2774	51 505 0		INDEX	AXISCTR	
0477	REF	9	LAST	1439	17,2775	11 525 0		CCS	TJU	
0478					17,2776	1 3003 0		TCF	+5	
0479	REF	1			17,2777	1 3026 1		TCF	NCRCTAT	
0480					17,3000	1 3002 1		TCF	+2	
0481	REF	2	LAST	1443	17,3001	1 3026 1		TCF	NCRCTAT	
0482					17,3002	22 007 0		ZL		
0483	REF	165	LAST	1442	17,3003	6 4753 1		AD	ONE	
0484	REF	5	LAST	1427	17,3004	55 737 1		TS	ABSTJ	
0485	REF	19	LAST	1443	17,3005	3 1505 0		CA	AXISCTR	
0486	REF	284	LAST	1443	17,3006	6 0001 0		AD	L	
0487	REF	8	LAST	1433	17,3007	55 744 0		TS	ROTINDEX	0 1 2 3 = -U -V -+U +V
0488	REF	6	LAST	1443	17,3010	3 1737 0		CA	ABSTJ	
0489	REF	1			17,3011	6 2137 1		AD	-150MS	
0490					17,3012	1 0006 1		EXTEND		
0491	REF	1			17,3013	6 3037 0		BZMF	DOSKIP	

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0492	REF	2	LAST	1433	17,3014	0 3225 1	TC	SELCTSUB	
0493	REF	20	LAST	1443	17,3015	51'505 0	INDEX	AXISCTR	
0494	REF	1			17,3016	3 3134 1	CA	INDEXFS	
0495	REF	285	LAST	1443	17,3017	54 001 1	TS	L	
0496	REF	7	LAST	1434	17,3020	3 1741 1	CA	PCLYTEMP	
0497					17,3021	0 0004 0	INHINT		
0498	REF	286	LAST	1444	17,3022	50 001 0	INDEX	L	
0499	REF	4	LAST	1427	17,3023	0 5744 0	TC	WRITEP	
0500					17,3024	0 0003 1	RELINT		
0501	REF	1			17,3025	1 3100 1	TCF	FEEDBACK	
0502	REF	21	LAST	1444	17,3026	51'505 0	NCROTAT	INDEX	AXISCTR
0503	REF	2	LAST	1444	17,3027	3 3134 1	CA	INDEXFS	
0504					17,3028	0 0004 0	INHINT		
0505	REF	512	LAST	1442	17,3031	50 000 1	INDEX	A	
0506	REF	5	LAST	1444	17,3032	0 5743 1	TC	WRITEP -1	
0507					17,3033	0 0003 1	RELINT		
0508	REF	22	LAST	1444	17,3034	11'505 1	CCS	AXISCTR	
0509	REF	4	LAST	1442	17,3035	0 1477 1	TC	PFTJACR	
0510	REF	1			17,3036	1 3270 0	TCF	CLOSFCUT	
0511	REF	7	LAST	1443	17,3037	4 1737 1	CS	ABSTJ	
0512	REF	2	LAST	1436	17,3040	6 3136 0	AD	+TJMINT6	14MS
0513					17,3041	0 0006 1	EXTEND		
0514	REF	1			17,3042	6 3061 0	BZMF	NOTMIN	
0515	REF	8	LAST	1444	17,3043	27'737 1	ADS	ABSTJ	
0516	REF	23	LAST	1444	17,3044	51'505 0	INDEX	AXISCTR	
0517	REF	10	LAST	1442	17,3045	11'525 0	CCS	TJU	
0518	REF	3	LAST	1444	17,3046	3 3136 0	CA	+TJMINT6	
0519					17,3047	1 3051 1	TCF	+2	
0520	REF	4	LAST	1444	17,3050	4 3136 1	CS	+TJMINT6	
0521	REF	24	LAST	1444	17,3051	51'505 0	INDEX	AXISCTR	
0522	REF	11	LAST	1444	17,3052	55'525 0	TS	TJU	
0523	REF	4	LAST	1423	17,3053	11'500 1	CCS	SENSETYPE	ENSURE MIN-IMPULSE NOT AGAINST TRANS
0524	REF	2	LAST	1444	17,3054	1 3060 0	TCF	NOTMIN -1	
0525					17,3055	0 0006 1	EXTEND		
0526	REF	6	LAST	563	17,3056	50 004 0	READ	LOSCALAR	
0527	REF	170	LAST	1443	17,3057	7 4753 0	MASK	ONE	
0528	REF	11	LAST	1442	17,3060	55'743 1	TS	NUMBERT	
0529	REF	3	LAST	1444	17,3061	0 3225 1	NOTMIN	TC	SELCTSUB
0530	REF	25	LAST	1444	17,3062	51'505 0	INDEX	AXISCTR	
0531	REF	3	LAST	1444	17,3063	3 3134 1	CA	INDEXFS	
0532					17,3064	0 0004 0	INHINT		

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0533	REF	5	LAST	1427	17,3165	55'471 0	TS	T6FURTHA +1
0534	REF	8	LAST	1444	17,3166	3 1741 1	CA	PCLYTEMP
0535	REF	6	LAST	1445	17,3167	51'471 1	INDEX	T6FURTHA +1
0536	REF	6	LAST	1444	17,3170	0 5744 0	TC	WRITEP

0537	REF	9	LAST	1444	17,3171	3 1737 0	CA	ABSTJ
0538	REF	7	LAST	1445	17,3172	55'470 1	TS	T6FURTHA
0539	REF	2	LAST	1427	17,3173	0 3143 1	TC	JTLST

IN QR BANK BY NOW

0540					17,3174	0 0103 1	REFINT	
------	--	--	--	--	---------	----------	--------	--

0541	REF	299	LAST	1440	17,3175	3 4755 1	CA	ZTRC
0542	REF	26	LAST	1444	17,3176	51'515 0	INDEX	AXISCTP
0543	REF	7	LAST	1442	17,3177	55'535 1	TS	SKIPU

0544	REF	44	LAST	1375	17,3100	4 6250 1	FEEDBACK	CS THREE
0545	REF	12	LAST	1444	17,3101	6 1743 0	AD	NUMBERB
0546					17,3102	0 0006 1	EXTEND	
0547					17,3103	6 3106 0	BZMF	+3

0548	REF	100	LAST	1443	17,3104	3 4752 0	CA	TWC
0549					17,3105	1 3107 0	TCF	+2
0550	REF	171	LAST	1444	17,3106	3 4753 1	CA	ONE
0551	REF	27	LAST	1445	17,3107	51'515 0	INDEX	AXISCTR
0552	REF	2	LAST	134	17,3110	55'522 1	TS	NC.UJETS
0553	REF	3	LAST	1442	17,3111	1 3134 1	TCF	LOOPER

0554	REF	300	LAST	1445	17,3112	3 4755 1	XTRANS	CA ZFED
0555	REF	12	LAST	1444	17,3113	55'525 0	TS	TJU
0556	REF	3	LAST	1435	17,3114	55'526 0	TS	TJV
0557	REF	42	LAST	1442	17,3115	3 4751 0	CA	FCLR
0558					17,3116	0 0004 0	INHINT	
0559	REF	8	LAST	1445	17,3117	57'535 0	XCF	SKIPU
0560					17,3120	0 0006 1	EXTEND	
0561					17,3121	1 3123 0	BZF	+2
0562	REF	1			17,3122	0 5747 0	TC	WRITEU -1
0563	REF	43	LAST	1445	17,3123	3 4751 0	CA	FCUR
0564	REF	2	LAST	1402	17,3124	57'536 0	XCF	SKIPV
0565					17,3125	0 0003 1	REFINT	

0566					17,3126	0 0006 1	EXTEND	
0567	REF	2	LAST	1444	17,3127	1 3270 0	BZF	CLOSEFUT
0568					17,3130	0 0004 0	INHINT	
0569	REF	1			17,3131	0 5760 0	TC	WRITEV -1
0570					17,3132	0 0003 1	REFINT	

0571	REF	3	LAST	1445	17,3133	1 3270 0	TCF	CLOSECUT
0572					17,3134	00014 0	INDEXES	DEC 4
0573					17,3135	00015 0	DEC	13
0574					17,3136	00026 0	+TJMINTE	DEC 22

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0575 17,3137 77417 C -150MS CEC -240
 0576 17,3140 00600 1 BIT8,S OCT 00600
 0577 17,3141 00266 C SCINCRM OCT 266
 0578 RFF 1 17,3142 02720 C TJLAWADR GENADR TJLAW +3

RETURN ADDRESS FOR RCS ATTITUDE CONTROL

A0579
 A0580

THE JET LIST:
 THIS IS A WAITLIST FOR T6RLFTS.

A0581
 A0582
 A0583
 A0584
 A0585
 A0586

CALLED BY:
 CA TJ TIME WHEN NEXT JETS WILL BE WRITTEN
 TS T6FLRTHA
 CA INDFX AXIS TO BE WRITTEN AT IJ (FROM NOW)
 TS T6FURTHA +1
 TC JTLLST

A0587
 A0588
 A0589
 A0590
 A0591

EXAMPLE- U-AXIS AUTOPILOT WILL WRITE ITS ROTATION CODE OF
 JETS INTO CHANNEL 5. IF IT DESIRES TO TURN OFF THIS POLICY WITHIN
 150MS AND THEN FIRE NEXT, A CALL TO JTLLST IS MADE WITH T6FLRTHA
 CONTAINING THE TIME TO TURN OFF THE POLICY, T6FURTHA +1 THE INDEX
 OF THE U-AXIS(4), AND NEXTU WILL CONTAIN THE "L-TRANS" POLICY OR ZERO.

A0592
 A0593

THE LIST IS EXACTLY 3 LONG. (THIS LEADS TO SKIP LOGIC AND 150MS LIMIT)
 THE INDFX IS THE LAST MEMBER OF THE LIST

A0594
 A0595

RETURNS BY:
 + TC C

A0596
 A0597
 A0598
 A0599
 A0600
 A0601
 A0602

DEFINITIONS: (COLUPLT)
 TIME6 TIME OF NEXT RLPT
 T6NEXT DELTA TIME TO NEXT RLPT
 T6FURTHA DELTA TIME FROM 2ND TO LAST RLPT
 NXT6ACR AXIS INDEX Q - P-AXIS
 T6NEXT +1 AXIS INDEX 4 - U-AXIS
 T6FURTHA +1 AXIS INDEX 13 - V-AXIS
 JTLLST CS T6FURTHA
 AD TIME6
 EXTEND
 BZMF MICRLST TIME6 - T IS IN A

0603 RFF 9 LAST 1445 17,3143 4 1470 1
 0604 RFF 5 LAST 1402 17,3144 6 0021 0
 0605 17,3145 7 0016 1
 0606 RFF 1 17,3146 6 2163 0
 0607 RFF 4 LAST 1402 17,3147 23 465 1
 0608 RFF 9 LAST 1402 17,3150 53 467 1
 0609 RFF 9 LAST 1446 17,3151 53 471 0
 0610 RFF 6 LAST 1446 17,3152 54 031 1
 0611 RFF 5 LAST 1446 17,3153 23 465 1

LXCH NXT6ACR
 CXCH T6NEXT
 CXCH T6FURTHA
 TS TIME6
 LXCH NXT6ACR

0612
 06121 RFF 7 LAST 1424 17,3154 0 0006 1
 06122 RFF 1 LAST 1424 17,3155 23 265 1
 17,3156 0 6022 1
 06123 RFF 52 LAST 1436 17,3157 3 4735 1

TERNON EXTEND
 QXCH C13QSAV
 TC C13STALL
 CA BIT15

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0613				17,3161	0 0006 1	EXTEND		
0614	REF	24	LAST 1424	17,3161	35 013 0	WOP	CHAN13	
0615	REF	8	LAST 1446	17,3162	0 1265 1	TC	C13QSAV	
0616	REF	10	LAST 1446	17,3163	6 1466 1	MIDORLST	AD T6NEXT	
0617				17,3164	1 0006 1	EXTEND		
0618	REF	1		17,3165	6 3174 0	PZMF	LASTCHG	TIME6 + T6NEXT - T IS IN A
0619	REF	11	LAST 1447	17,3166	23 1467 0	LXCH	T6NEXT +1	
0620	REF	10	LAST 1446	17,3167	53 1471 0	CXCH	T6FURTHA	
0621				17,3170	0 0006 1	EXTEND		
0622	REF	7	LAST 1446	17,3171	60 031 0	SU	TIME6	
0623	REF	12	LAST 1447	17,3172	53 1467 1	CXCH	T6NEXT	
0624	REF	412	LAST 1441	17,3173	0 0002 0	TC	Q	
0625	REF	513	LAST 1444	17,3174	4 0000 0	LASTCHG	CS A	
0626	REF	27	LAST 1385	17,3175	6 4754 0	AD	NEG	
0627	REF	11	LAST 1447	17,3176	55 1470 1	TS	T6FLRTHA	
0628	REF	413	LAST 1447	17,3177	0 0002 0	TC	Q	

R0629 RCT-TOUV IS ENTERED WITH THE Q-COMPONENT OF THE QUANTITY TO BE TRANSFORMED IN A AND THE R-COMPONENT IN L.
 R0631 RCT-TOUV TRANSFORMS THE QUANTITY INTO THE NON-ORTHOGONAL U-V AXIS SYSTEM. IN THE L-V SYSTEM NO CROSS-COULING IS
 R0633 PRODUCED FROM RCS JET FIRINGS. AT THE COMPLETION OF RCT-TOUV, THE L-COMPONENT OF THE TRANSFORMED QUANTITY IS IN
 R0635 A AND THE V-COMPONENT IS IN L.

0636	REF	1		17,3200	23 174 0	RCT-TOUV	LXCH	RCTEMP2	(R) IS PLT INTO RCTEMP2
0637				17,3201	0 0006 1	EXTEND	A		
0638	REF	2	LAST 135	17,3212	7 1627 1	MP	COEFFC		
0639	REF	2	LAST 1447	17,3213	57 1740 0	XCH	RCTEMP2		(R) GOES TO A AND COEFFC.(Q) TO RCTEMP2
0640				17,3204	0 0006 1	EXTEND			
0641	REF	1		17,3215	7 1630 1	MP	COEFFR		
0642	REF	287	LAST 1444	17,3216	54 111 1	TS	L		COEFFR.(R) IS PUT INTO L
0643	REF	3	LAST 1447	17,3217	6 1740 0	AD	RCTEMP2		
0644	REF	1		17,3210	55 1737 1	TS	RCTEMP1		COEFFC.(Q)+COEFFR.(R) IS FLT IN RCTEMP1
0645				17,3211	1 3215 0	TCF	+4		
0646	REF	514	LAST 1447	17,3212	50 000 1	INDEX	A		COEFFC.(Q) + COEFFR.(R) HAS OVERFLOWED
0647	REF	8	LAST 1410	17,3213	4 4734 1	CS	LIMITS		AND IS LIMITED TO POSMAX OR NEGMAX
0648	REF	2	LAST 1447	17,3214	55 1737 1	TS	RCTEMP1		
0649	REF	4	LAST 1447	17,3215	4 1740 1	CS	RCTEMP2		
0650	REF	288	LAST 1447	17,3216	6 0111 0	AD	L		-COEFFC.(Q) + COEFFR.(R) IS NOW IN A
0651				17,3217	54 107 1	TS	7		
0652				17,3220	1 3223 0	TCF	+3		
0653	REF	515	LAST 1447	17,3221	50 012 1	INDEX	A		-COEFFC.(Q) + COEFFR.(R) HAS OVERFLOWED
0654	REF	9	LAST 1447	17,3222	4 4734 1	CS	LIMITS		AND IS LIMITED TO POSMAX OR NEGMAX
0655	REF	3	LAST 1447	17,3223	23 1737 0	LXCH	RCTEMP1		COEFFC.(Q) + COEFFR.(R) IS PLT INTO L
0656	REF	414	LAST 1447	17,3224	0 0002 0	TC	Q		
0657	REF	9	LAST 1443	17,3225	51 1744 1	SELECTSUP	INDEX	ROTINDEX	

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0658	PFF	1		17,3226	3 3257 1	CA	ALLJETS		
0659	REF	13	LAST 1445	17,3227	51'743 0	INDEX	NUMBER		
0660	REF	1		17,3230	7 3263 1	MASK	TYPEPCLY		
0661	REF	9	LAST 1445	17,3231	55'741 0	TS	POLYTEMP		
0662	REF	7	LAST 212	17,3232	7 1257 1	MASK	CF5MASK		
0663	REF	516	LAST 1447	17,3233	10 000 0	CCS	A		
0664				17,3234	1 3236 1	TCF	+2		
0665	REF	415	LAST 1447	17,3235	0 0002 0	TC	G		
0666	REF	45	LAST 1445	17,3236	3 6250 0	CA	THREE		
0667	REF	14	LAST 1448	17,3237	55'743 1	FAILCCP	TS	NUMBER	
0668	REF	10	LAST 1447	17,3240	51'744 1	INDEX	ACTINDEX		
0669	REF	2	LAST 1448	17,3241	3 3257 1	CA	ALLJETS		
0670	REF	15	LAST 1448	17,3242	51'743 0	INDEX	NUMBER		
0671	PFF	2	LAST 1448	17,3243	7 3263 1	MASK	TYPEPCLY		
0672	REF	10	LAST 1448	17,3244	55'741 0	TS	POLYTEMP		
0673	REF	8	LAST 1448	17,3245	7 1257 1	MASK	CF5MASK		
0674				17,3246	0 3006 1	EXTEND			
0675	REF	1		17,3247	1 3235 1	BZF	FAILLOOP -2		
0676	REF	16	LAST 1448	17,3251	11'743 1	CCS	NUMBER		
0677	REF	2	LAST 1448	17,3251	1 3237 0	TCF	FAILCCP		
0678	REF	28	LAST 1445	17,3252	51'505 0	INDEX	AXISCTR		
0679	REF	12	LAST 1445	17,3252	55'525 0	TS	TJC		
0680	REF	51	LAST 1433	17,3254	0 5567 0	TC	ALARM		
0681				17,3255	02004 1	CCT	02004		
0682	REF	3	LAST 1443	17,3256	1 3026 1	TCF	NERCIAT		
0683				17,3257	00110 1	ALLJETS	CCT	00110	-U 6 13
0684				17,3257	00022 1		CCT	00022	-V 2 5
0685				17,3261	00204 1		CCT	00204	+U 5 14
0686				17,3262	00041 1		CCT	00041	+V 1 10
0687				17,3263	00125 1	TYPEPCLY	CCT	00125	-X 1 5 9 13
0688				17,3264	00252 1		CCT	00252	+X 2 6 10 14
0689				17,3265	00146 1		CCT	00146	A 2 5 10 13
0690				17,3266	00231 1		CCT	00231	B 1 6 9 14
0691				17,3267	00377 1		CCT	00377	ALL 1 2 5 6 9 10 13 14

R0692 THE FOLLOWING SPTS THE INTERRUPT FLIP-FLCP AS SOON AS POSSIBLE, WHICH PERMITS A RETURN TO THE INTERRUPTED JCB.

0694	REF	1		17,3270	3 3272 0	CLOSECUT	CA	ADRRUPT
0695	REF	1		17,3271	0 7757 0		TC	MAKRUPT
0696	REF	1		17,3272	02273 1	ADRRUPT	ADRES	ENDJASK
0697	REF	5	LAST 1418	17,3273	53'754 1	ENDJASK	DXCH	DARRUPT
0698	REF	12	LAST 1418	17,3274	52 011 0		EXCH	ARRUPT
0699	REF	2	LAST 1418	17,3275	53'756 0		DXCH	DARRGRPT
0700	REF	4	LAST 1418	17,3276	56 017 1		XCH	BRUPT

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0701 REF 416 LAST 1448 17,3277 22 002 0
 0702 REF 10 LAST 1410 17,3300 3 4735 1
 0703 REF 4 LAST 1418 17,3301 53'760 0
 0704 PPF 2 LAST 1418 17,3302 52 016 1
 0705 REF 1 17,3303 1 5272 1
 0706 7757
 0707 REF 5 LAST 1292 6100
 0708 7757

LXCH Q
 CAF NFGMAX
 DXCH DAPZRUPT
 DXCH ZRUPT
 TCF NCGPSM
 BLOCK 3
 SETLCC FFTAGG
 BANK

NEGATIVE DAPZRUPT SIGNALS JASK IS CVER.

0709 REF 1

CCUNT* \$\$/DAP

0710 7757 0 0006 1
 0711 PPF 2 LAST 1448 7750 07 757 0

MAKERUPT EXTEND
 FORLEFT MAKERUPT

L TJET LAW

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R0001 PROGRAM DESCRIPTION

R0002 DESIGNED BY: R. F. GROSS AND P. S. WEISSMAN

R0003 CODED BY: P. S. WEISSMAN 23 FEBRUARY 1968

R0004 TJETLAW IS CALLED AS A SUBROUTINE WHEN THE LEM IS NOT DOCKED AND THE AUTCPILCT IS IN THE AUTOMATIC OR
 R0006 ATTITUDE-HOLD MODE TO CALCULATE THE JET-FIRING-TIME (TJET) REQUIRED FOR THE AXIS INDICATED BY AXISCTR:

-1 INDICATES THE P-AXIS

+0 INDICATES THE U-AXIS

+1 INDICATES THE V-AXIS.

R0011 THE REGISTERS E AND EDOT CONTAIN THE APPROPRIATE ATTITUDE ERROR AND ERROR RATE AND SENSETYP SHOWS WHETHER
 R0013 UNBALANCED COUPLES ARE PREFERRED. TJETLAW ALSO USES VARIOUS FUNCTIONS OF ACCELERATION AND DECELERATION WHICH ARE
 R0015 COMPUTED IN THE 1/ACCNT SECTION OF 1/ACCS AND ARE STORED IN SUCH AN ORDER THAT THEY CAN BE CONVENIENTLY
 R0017 ACCESSSED BY INDEXING.

R0018 THE SIGN OF THE REQUIRED ROTATION IS CARRIED THROUGH TJETLAW AS ROTSENSE AND IS FINALLY APPLIED TO TJET JUST
 R0020 PREVIOUS TO ITS STORAGE IN THE LOCATION CORRESPONDING TO THE AXIS (TJP, TJU OR TJV). THE NUMBER OF JETS THAT
 R0022 TJETLAW ASSUMES WILL BE USED IS INDICATED BY THE SETTING OF NUMBERT FOR THE U- OR V-AXIS. TWO JETS ARE ALWAYS
 R0024 ASSUMED FOR THE P-AXIS ALTHOUGH FOUR JETS WILL BE FIRED WHEN FIREECT IS MORE NEGATIVE THAN -4.0 DEGREES
 R0026 (FIREECT IS THE DISTANCE TO A SWITCH CURVE IN THE PHASE PLANE) AND A LONG FIRING IS CALLED FOR.

R0028 IN ORDER TO AVOID SCALING DIFFICULTIES, SIMPLE ALGORITHMS TAGGED RLFLAW1, -2 AND -3 ARE RESORTED TO WHEN THE
 R0030 ERROR AND/OR ERROR RATE ARE LARGE.

R0031 CALLING SEQUENCE:

R0032 TC TJETLAW (MUST BE IN JASK)

R0033 OR

R0034 INFINT (MUST BE IN JASK)

R0035 TC IBANKCALL

R0036 CACR TJETLAW

R0037 RELINT

R0038 EXIT: RETURN TO Q.

R0039 INPUT:

R0040 FROM THE CALLER: F, EDOT, AXISCTR, SENSETYP, TJP, -U, -V.

R0041 FROM 1/ACCNT: 48 PARAMETERS BEGINNING AT BLOCKTOP (INCLUDING FLAT, ZONEBLIM AND ACCSWU, -V).

R0043 OUTPUT:

R0044 TJP, -L OR -V, NUMBERT (CAPTEMP5), FIREECT (CAPTEMP2).

R0045 DEPENDS:

R0046 A, L, G, E, EDOT, CAPTEMP1-6, CAPTEMP1-4.

P0047 ALARM: NONE

0048 17,3304

0049 REF 4 LAST 1432 17,2100

0050 17,3304

0051 REF 13 LAST 1429 16,1524

BANK 17

SETLCC DAPS2

BANK

EBANK= TJP

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0052 REF 1                                COUNT* $$/DAPTJ
0053                                17,3304 0 0006 1 TJETLAW EXTEND
0054 REF 1                                17,3305 231745 0 GXC+ HOLDG SAVE C FOR RETURN.

R0055 SET INDEXERS TO CORRESPOND TO THE AXIS AND TO THE SIGN OF EDCT

0056 REF 29 LAST 1448 17,3306 511575 0 INDEX AXISCTR AXISDIFF(-)=AC OF LOCATIONS REF P AND U
0057 REF 2 LAST 1439 17,3307 3 2755 0 CAF AXISDIFF AXISDIFF(0) = 0
0058 REF 1 17,3308 551746 1 TS ADRSDIF1 AXISDIFF(+)=AC OF LOCATIONS BET V AND U

0059 REF 3 LAST 1442 17,3311 311427 1 CAE EDCT IF EDCT NEGATIVE, PICK UP SET OF VALUES
0060 REF 1 17,3312 0 0006 1 EXTEND THAT ALLOW USE OF SAME CODING AS FOR
0061 REF 1 17,3313 6 2220 0 EZMF NEGEDCT POSITIVE EDCT.
0062 REF 2 LAST 1451 17,3314 311746 0 CAE ACRSDIF1 SET A SECOND INDEXER WHICH MAY BE
0063 REF 1 17,3315 551744 0 TS ACRSDIF2 MODIFIED BY A DECISION FOR MAX JETS.
0064 REF 1 17,3316 3 3757 1 CAF SENSOR FOR POSITIVE EDCT, ROTSENSE IS
0065 REF 1 17,3317 1 2330 0 TCF SETSENSE INITIALIZED POSITIVE.

0066 REF 9 LAST 1442 17,3320 4 1752 1 NEGEDCT CS F IN CASE FOR NEG EDCT CASE TO USE CODING
0067 REF 10 LAST 1451 17,3321 551752 1 TS F OF POS EDCT, MUST MODIFY AS FOLLOWS:
0068 REF 4 LAST 1451 17,3322 4 1427 0 CS EDCT 1. COMPLEMENT E AND EDCT.
0069 REF 5 LAST 1451 17,3323 551427 0 TS EDCT 2. SET SENSE OF ROTATION TO NEGATIVE
0070 REF 63 LAST 1436 17,3324 3 4753 1 CAF BIT1 (REVERSED LATER IF NECESSARY).
0071 REF 3 LAST 1451 17,3325 271746 1 ADS ACRSDIF1 3. INCREMENT INDEXERS BY ONE SO THAT
0072 REF 2 LAST 1451 17,3326 551744 0 TS ACRSDIF2 THE PROPER PARAMETERS ARE ACCESSED.
0073 REF 2 LAST 1451 17,3327 4 2757 0 CS SENSE
0074 REF 1 17,3330 551740 1 SETSENSE TS ROTSENSE

R0075 TEST MAGNITUDE OF E (ATTITUDE ERROR, SINGLE-PRECISION, SCALED AT PI/16 RADIANS):
R0077 IF GREATER THAN (OR EQUAL TO) PI/16 RADIANS, GO TO THE SIMPLIFIED TJET ROUTINE.
R0078 IF LESS THAN PI/16 RADIANS, RESCALE TO PI/4.

0080 REF 11 LAST 1451 17,3331 311752 0 CAE F PICK UP ATTITUDE ERROR FOR THIS AXIS
0081 REF 1 17,3332 0 0006 1 EXTEND
0082 REF 51 LAST 1434 17,3333 7 4747 0 MP BITS SHIFT RIGHT TEN BITS; IF A-REGISTER IS
0083 REF 517 LAST 1448 17,3334 10 000 0 CCS A ZERO, RESCALE AND TEST EDCT.
0084 REF 1 17,3335 1 3717 1 TCF RFLAW2
0085 REF 1 17,3336 1 3340 1 TCF SCALEE
0086 REF 1 17,3337 1 2663 0 TCF RFLAW1
0087 REF 57 LAST 1434 17,3340 3 4737 0 SCALEE CAF EPROE IS IN L SCALED AT PI/16. RESCALE
0088 REF 1 17,3341 0 0006 1 EXTEND IT TO PI/4 AND SAVE IT.
0089 REF 299 LAST 1447 17,3342 7 0001 1 MP L
0090 REF 12 LAST 1451 17,3343 551752 1 TS E

R0091 TEST MAGNITUDE OF EDCT (ERROR RATE SCALED AT PI/4 RADIANS/SECND)
R0092 IF GREATER THAN (OR EQUAL TO) PI/32 RADIANS/SECND, GO TO THE SIMPLIFIED TJET ROUTINE.
R0094 IF LESS THAN PI/32 RADIANS/SECND, THEN RESCALE TO PI/32 RADIANS/SECND.

0096 REF 6 LAST 1451 17,3344 311427 1 CAE EDCT PICK UP SINGLE-PRECISION ERROR-RATE

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0097				17,3345	0 0006 I	EXTEND		FOR THIS AXIS=
0098	REF	58	LAST 1421	17,3346	7 4750 0	MP	BIT4	SHIFT RIGHT ELEVEN BITS, IF THE A-REG IS
0099				17,3347	0 0006 1	EXTEND		ZERO, THEN RESCALE AND USE FINELAW.
0100	REF	1		17,3350	1 3352 1	BZF	SCALEDCT	
0101	REF	1		17,3351	1 3725 0	TCF	RLFLAW3	
R0102	*** FINEFLAW STARTS HERE ***							
0103	REF	7	LAST 1451	17,3352	231427 I	SCALEDCT	LXCH	EDCT
								EDCT IS SCALED AT PI/32 RADIAN/SECND.
0104	REF	8	LAST 1452	17,3353	311427 1	CAF	EDCT	COMPUTE (EDCT)(EDCT)
0105				17,3354	0 0006 1	EXTEND		
0106				17,3355	7 1100 0	SQUARE		PRODUCT SCALED AT PI(2)/2(10) RAD/SEC.
0107				17,3356	0 0006 1	EXTEND		
0108	REF	58	LAST 1451	17,3357	7 4737 1	MP	BIT13	SHIFT RIGHT TWO BITS TO RESCALE EDCTSQ
0109	REF	1		17,3360	551737 I	TS	EDCTSQ	TO PI(2)/2(8) RAD(2)/SEC(2).
0110	REF	12	LAST 1451	17,3361	111752 1	ERRTEST	CCS	F
0111				17,3362	1 3365 0	TCF	+3	CCES BIG ERROR (THREE DEG BEYOND THE
0112				17,3363	1 3365 0	TCF	+2	CEACHAND) REQUIRE MAXIMUM JETS?
01125				17,3364	1 3365 0	TCF	+1	
0113	REF	1		17,3365	6 2760 0	AD	-3DEG	
0114				17,3366	0 0006 1	EXTEND		
0115	REF	4	LAST 1451	17,3367	5 1746 0	INDEX	ADRSCIF1	
0116	REF	1		17,3371	611601 I	SU	FIREDB	
0117				17,3371	0 0006 1	EXTEND		
0118	REF	1		17,3372	6 3377 1	BZMF	SENSTEST	IF NOT: ARE UNBALANCED JETS PREFERRED?
0119	REF	101	LAST 1445	17,3373	3 4752 0	MAXJETS	CAF	IF YES: INCREMENT ADDRESS LOCATOR AND
0120	REF	2	LAST 1451	17,3374	271744 0	ADS	ADRSCIF2	SET SWITCH FOR JET SELECT LOGIC TO 4.
0121	REF	44	LAST 1445	17,3375	3 4751 0	CAF	FCLR	(ALWAYS DO THIS FOR F-AXIS)
0122	REF	1		17,3376	1 3402 0	TCF	TJCALC	
0123	REF	5	LAST 1444	17,3377	111500 1	SENSTEST	CCS	CCES TRANSLATION PREFER MIN JETS.
0124	REF	2	LAST 1452	17,3400	1 3402 0	TCF	TJCALC	YES. USE MIN-JET PARAMETERS.
0125	REF	1		17,3401	1 3373 1	TCF	MAXJETS	NO. GET MAX-JET PARAMETERS.
0126	REF	17	LAST 1448	17,3402	551742 I	TJCALC	TS	SET TO +0,1,4 FOR (U,V-AXES) JET SELECT.

R0127 BEGINNING OF TJFT CALCULATIONS:

0128	REF	2	LAST 1452	17,3403	4 1737 1	CS	EDCTSQ	SCALED AT PI(2)/2(8).
0129				17,3404	0 0006 1	EXTEND		
0130	REF	4	LAST 1452	17,3405	5 1744 1	INDEX	ADRSCIF2	
0131	REF	8	LAST 1451	17,3406	7 1567 0	MP	1/ANF11	.5/ACC SCALED AT 2(6)/PI SEC(2)/RADIAN.
0132	REF	5	LAST 1452	17,3407	511746 0	INDEX	ADRSCIF1	
0133	REF	2	LAST 1452	17,3410	6 1601 1	AC	FIPECE	CFACBAND SCALED AT PI/4 RADIAN.
0134				17,3411	0 0006 1	EXTEND		
0135	REF	14	LAST 1452	17,3412	611752 0	SU	F	ATTITUDE ERROR SCALED AT PI/4 RADIAN.
0136	REF	2	LAST 1429	17,3413	551741 0	TS	FIREFCT	-E-.5(EDCTSQ)/ACC-DB AT PI/4 RADIAN.
0137				17,3414	0 0006 1	EXTEND		
0138	REF	1		17,3415	6 3575 0	BZMF	ZON1,2,3	
0139	REF	6	LAST 1452	17,3416	511746 0	ZONE4,5	INDEX	ADRSCIF1

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0140 REF 1 17,3417 31'573 1
 0141 17,3420 0 0006 1
 0142 REF 3 LAST 1452 17,3421 7 1737 1
 0143 REF 15 LAST 1452 17,3422 6 1752 0
 0144 REF 7 LAST 1452 17,3423 51'746 0
 0145 REF 1 17,3424 6 1603 0
 0146 17,3425 0 0006 1
 0147 REF 1 17,3426 6 2461 1
 AC14P

CAF 1/ACCAST
 EXTEND
 MP EDDTSQ
 AC F
 INDEX ADRSCIF1
 AC COASTDB
 EXTEND
 BZMF ZONE5

.F/ACC SCALED AT $2(6)/PI$ WHERE
 $ACC = MAX(AMIN, ACS-)$.
 SCALED AT $PI/2(8)$.
 SCALED AT $PI/4$
 SCALED AT $PI/4$ POS. FOR NEG. INTERCEPT.
 TEST $E+.5(EDOTSQ)/ACC+CB$ AT $PI/4$ RADIAN.
 IF FUNCTION NEGATIVE, FIND TJFT.
 IF FUNCTION POSITIVE, IN ZONE 4.

RO149 ZONE 4 IS THE COAST REGION. HOWEVER, IF THE JETS ARE ON AND DRIVING TOWARD
 RO151 A. THE AXIS WITHIN + OR - (CB + FLAT) FOR DRIFTING FLIGHT, OR
 RO152 P. THE USUAL TARGET PARABOLA FOR POWERED FLIGHT
 RO153 THEN THE THRUSTERS ARE KEPT ON.

0154 REF 30 LAST 1451 17,3427 51'505 0 ZONE4
 0155 REF 1 17,3430 4 1525 0
 0156 17,3431 0 0006 1
 0157 REF 2 LAST 1451 17,3432 7 1740 1
 0158 17,3433 0 0006 1
 0159 REF 1 17,3434 6 3455 0
 0160 REF 1 17,3435 11'555 1 JETSCN
 0161 REF 1 17,3436 1 3447 1
 0162 REF 3 LAST 1452 17,3437 4 1741 0
 0163 REF 8 LAST 1453 17,3440 51'746 0
 0164 REF 1 17,3441 6 1615 0
 0165 17,3442 0 0006 1
 0166 REF 2 LAST 1453 17,3443 6 3455 0
 0167 REF 1 17,3444 0 3561 0
 0168 REF 4 LAST 1453 17,3445 11'741 1
 0169 REF 1 17,3446 1 3615 1

INDEX AXISCTP
 CS TJFTU
 EXTEND
 MP RCTSENSE
 EXTEND
 BZMF COASTTJ
 CCS FLAT
 TCF DRIFT/ON
 CS FIREFCT
 INDEX ADRSCIF1
 AC AXISDIST
 EXTEND
 BZMF COASTTJ
 TC Z123COMP
 CAE FIREFCT
 TCF ZONE1

IS THE CURRENT VALUE IN TJFT NON-ZERO
 WITH SENSE OPPOSITE TO EDDT,
 (I.E., ARE JETS ON AND FIRING TOWARD
 THE DESIRABLE STATE).
 NO. COAST.
 YES. IS THIS DRIFTING OR POWERED FLIGHT?
 DRIFTING. DO MAKE FURTHER TEST.
 POWERED (OR ULLAGE). CAN TARGET PARABOLA
 BE REACHED FROM THIS POINT IN THE
 PHASE PLANE?
 NO. SET TJFT = 0.
 YES. CALCULATE TJFT AS THOUGH IN ZONE 1
 AFTER COMPUTING THE REQUIRED
 PARAMETERS.

0170 REF 9 LAST 1453 17,3447 51'746 0 CRIFT/ON
 0171 REF 2 LAST 1452 17,3450 4 1601 0
 0172 17,3451 6 0000 1
 0173 REF 5 LAST 1453 17,3452 6 1741 1
 0174 17,3453 0 0006 1
 0175 17,3454 6 3457 1
 0176 REF 301 LAST 1445 17,3455 3 4755 1 COASTTJ
 0177 REF 1 17,3456 1 3521 0

INDEX ADRSCIF1
 CS FIREFDE
 COUPLE
 AC FIREFCT
 EXTEND
 BZMF +3
 CAF ZERO
 TCF RETURN TJ

CAN TARGET STRIP OF AXIS BE REACHED FROM
 THIS POINT IN THE PHASE PLANE?
 NO. SET TJFT = 0.

0178 REF 2 LAST 1453 17,3457 0 3561 0
 0179 REF 1 17,3460 1 3602 1

TC Z123COMP
 TCF ZONE2,3

YES. CALCULATE TJFT AS THOUGH IN ZONE 2
 OR 3 AFTER COMPUTING REQUIRED VALUES.

0180 REF 290 LAST 1451 17,3461 54 001 1 ZONE5
 0181 REF 3 LAST 1452 17,3462 11'740 1
 0182 17,3463 1 3467 0
 0183 REF 22 LAST 1394 17,3464 0 5675 0

TS L
 CCS RCTSENSE
 TCF +4
 TC COASTCLE

TEMPORARILY STORE FUNCTION IN L.
 RECTIFY ADRSCIF2 FOR ACCESSING 1/ANET2
 AND ACCFCT25, WHICH MUST BE PICKED UP
 FROM THE NEXT LOWER REGISTER IF THE

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0184 REF 132 LAST 1452 17,3465 4 4752 1
 0185 REF 5 LAST 1452 17,3466 271744 0
 0186 REF 291 LAST 1452 17,3467 30 001 0 +4
 0187 17,3470 0 0016 1
 0188 REF 6 LAST 1454 17,3471 5 1744 1
 0189 REF 1 17,3472 7 1576 0
 0190 17,3473 20 001 1
 0191 17,3474 20 001 1
 0192 REF 1 17,3475 531750 0
 0193 REF 7 LAST 1454 17,3476 511744 1
 0194 REF 2 LAST 1435 17,3477 311570 1
 0195 17,3500 0 0016 1
 0196 REF 9 LAST 1452 17,3501 7 1427 0
 0197 REF 1 17,3502 551742 0

CS TWC
 ACS ACSCDIF2
 CAE L
 EXTEND
 INDEX ACSCDIF2
 MP ACCECT25
 DDUEL
 DDUEL
 DXCH HH
 INDEX ACSCDIF2
 CAE 1/ANET2
 EXTEND
 MP ECCT
 TS TTCAXIS

(ACTUAL) ERROR RATE IS NEGATIVE.

TTCAXIS AND HH ARE THE PARAMETERS UPON WHICH THE APPROXIMATIONS TO TJET ARE BASED.

DOUBLE PRECISION H SCALED AT 8 SEC(2).

SCALED AT 2(7)/P1 SEC(2)/RAC.

SCALED AT PI/2(5)

SCALED AT 4 SEC.

R0198 TEST WHETHER TJET GREATER THAN 50 MSEC.

0199 17,3503 0 0006 1
 0200 REF 1 17,3504 7 3767 0
 0201 REF 2 LAST 1454 17,3505 6 1747 1
 0202 REF 9 LAST 1298 17,3506 6 7751 0
 0203 17,3507 0 0016 1
 0204 REF 1 17,3510 6 3536 1

EXTEND
 MP -.15AT2
 AD HF
 AD NEC2
 EXTEND
 BZMF FCFMULA1

H - .05 TTCAXIS - .00125 G.T. ZERO (SCALED AT 8 SEC(2)).

R0205 TEST WHETHER TJET GREATER THAN 150 MSEC.

0206 REF 2 LAST 1454 17,3511 311742 1
 0207 17,3512 0 0016 1
 0208 REF 1 17,3513 7 3770 0
 0209 REF 3 LAST 1454 17,3514 6 1747 1
 0210 REF 1 17,3515 6 2761 1
 0211 17,3516 0 0016 1
 0212 REF 1 17,3517 6 3546 0

CAE TTCAXIS
 EXTEND
 MP -.15AT2
 AD HF
 AD -.0112A8
 EXTEND
 BZMF FCFMULA2

H - .15 TTCAXIS - .01125 G.T. ZERO (SCALED AT 8 SEC(2))

R0213 IF TJET GREATER THAN 150 MSEC, ASSIGN IT VALUE OF 250 MSEC, SINCE THIS
 R0214 IS ENOUGH TO ASSURE NO SKIP NEXT CASE (100 MSEC).

0215 REF 21 LAST 1226 17,3520 2 4741 1 FULLTIME CAE BIT11

250 MSEC SCALED AT 4 SEC.

R0216 RETURN TO CALLING PROGRAM WITH JET TIME SCALED AS TIME6 AND SIGNED.

0217 17,3521 0 0006 1
 0218 REF 4 LAST 1453 17,3522 7 1740 1
 0219 REF 31 LAST 1453 17,3523 511505 0
 0220 REF 2 LAST 1452 17,3524 551525 0
 0221 17,3525 0 0006 1
 0222 REF 22 LAST 1454 17,3526 5 1515 0
 0223 REF 2 LAST 135 17,3527 7 1547 1
 0224 REF 292 LAST 1454 17,3531 30 001 0
 0225 17,3531 0 0006 1
 0226 17,3532 6 3535 1

RETURNJ EXTEND
 MP ROTSENSE
 INDEX AXISCTR
 TS TJFTU
 EXTEND
 INDEX AXISCTR
 MP ACCSWL
 CAE L
 EXTEND
 BZMF +3

ALL BRANCHES TERMINATE HERE WITH TJET (SCALED AT 4 SEC) IN THE ACCUMULATOR. POTSENSE APPLIES SIGN AND CHANGES SCALE.

SET SWITCH FOR JET SELECT IF ROTATION IS

IN A SENSE FOR WHICH 1/ACCS HAS FORCED A MAX-JET CALCULATION.

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0227 RFF 45 LAST 1452 17,3532 3 4751 0 CAF FCUP
 0228 RFF 18 LAST 1452 17,3534 55,743 1 TS NLMBERT
 0229 RFF 2 LAST 1451 17,3535 0 1745 0 TC HOLDQ

RETURN VIA SAVED Q.

R0230 TJET = $H / (.025 + TTCAXIS)$ FOR TJET LESS THAN 50 MSEC.

0231 RFF 1 17,3536 4 3766 1 FORMULA1 CS -.025AT4
 0232 RFF 3 LAST 1454 17,3537 6 1742 1 AC TTCAXIS
 0233 RFF 4 LAST 1454 17,3540 52,750 0 CXCH HF
 0234 17,3541 0 0006 1 EXTEND HF
 0235 RFF 5 LAST 1455 17,3542 11,747 0 CV HF
 0236 17,3543 0 0006 1 EXTEND HF
 0237 RFF 93 LAST 1413 17,3544 7 4736 0 MP BIT14
 0238 RFF 1 17,3545 1 3656 0 TCF CHKINTJ

.025 SEC SCALED AT 4.
 SCALED AT 4 SECONDS.
 STORE DENOMINATOR IN FIRST WORD OF F,
 WHICH NEED NOT BE PRESERVED. PICK UP
 DP F / AC DIVIDE BY DENOMINATOR.
 RESCALE TJET FROM 2 TO USUAL 4 SEC.
 CHECK THAT TJET IS NOT LESS THAN MINIMUM

R0239 TJET = $(F + .00375) / (.01 + TTCAXIS)$ FOR TJET GREATER THAN 50 MSEC.

0240 17,3546 0 0006 1 FORMULA2 EXTEND
 0241 RFF 1 17,3547 3 3772 0 DCA .00375AB
 0242 RFF 6 LAST 1455 17,3550 21,750 0 CAS HF
 0243 21,750 0
 0244 RFF 4 LAST 1455 17,3551 21,742 1 CAF TTCAXIS
 0245 RFF 1 17,3552 6 3762 1 AD .1AT4
 0246 RFF 7 LAST 1455 17,3553 53,750 0 CXCH HF
 0247 17,3554 0 0006 1 EXTEND HF
 0248 RFF 8 LAST 1455 17,3555 11,747 0 CV HF
 0249 17,3556 0 0006 1 EXTEND HF
 0250 RFF 84 LAST 1455 17,3557 7 4736 0 MP BIT14
 0251 RFF 2 LAST 1452 17,3560 1 3521 0 TCF RETURNJ

.00375 SEC(2) SCALED AT 8.
 STORE NUMERATOR IN DP F, WHICH NEED NOT
 BE PRESERVED.
 SCALED AT 4 SEC.
 0.1 SEC SCALED AT 4.
 STORE DENOMINATOR IN FIRST WORD OF F,
 WHICH NEED NOT BE PRESERVED. PICK UP
 DP NUMERATOR AND DIVIDE BY DENOMINATOR
 RESCALE TJET FROM 2 TO USUAL 4 SEC.
 END SUBROUTINE.

R0252 SUBROUTINIZED COMPUTATIONS REQUIRED FOR ALL ENTRIES INTO CODING FOR ZONES 1, 2, AND 3.

R0254 REACHED BY TC FROM 3 POINTS IN TJETLAW.

0255 RFF 5 LAST 1454 17,3561 4 1740 1 Z123COMP CS RTSENSE
 0256 RFF 6 LAST 1455 17,3562 55,743 1 TS RTSENSE
 0257 RFF 10 LAST 1454 17,3563 31,427 1 CAF FCOT
 0258 17,3564 0 0006 1 EXTEND
 0259 RFF 8 LAST 1454 17,3565 5 1744 1 INDEX ADRSCIF2
 0260 RFF 9 LAST 1452 17,3566 7 1567 0 MP 1/ANFT1
 0261 RFF 5 LAST 1455 17,3567 55,742 0 TS TTCAXIS
 0262 RFF 1 17,3571 6 3773 1 AC -TJMAX
 0263 17,3571 0 0006 1 EXTEND
 0264 17,3572 6 3574 1 BZMF +2
 0265 RFF 1 17,3573 1 3521 1 TCF FULLTIME
 0266 17,3574 0 0002 0 RETURN

USED IN RETURNJ SECTION TO RESCALE TJET
 AS TIME6 AND GIVE IT PROPER SIGN.
 SCALED AT $P1/2(15)$ RAD/SEC.

SCALED AT $2(7)/P1$ SEC(2)/RAD.
 STORE TIME-TC-AXIS SCALED AT 4 SECONDS.

IS TIME TC AXIS LESS THAN 150 MSEC.

NO. FIRE JETS, DO NOT CALCULATE TJET.
 YES. GO ON TO FIND TJET

0267 RFF 3 LAST 1453 17,3575 0 3561 0 ZONE1,2,3 TC Z123COMP

SUBROUTINIZED PREPARATION FOR ZONE1,2,3.

R0268 IF THE (NEG) DISTANCE BEYOND PARABOLA IS LESS THAN FLAT, USE SPECIAL

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R0265 LOGIC TO ACQUIRE MINIMUM IMPULSE LIMIT CYCLE. DURING POWERED FLIGHT
R0270 OR ULLAGE, FLAT = 0

0271	REF	6	LAST 1453	17,3576	31'741 1	CAF	FIFTEETH	SCALED AT PI/4 RAD.
0272	REF	2	LAST 1453	17,3577	6 1555 0	AC	FLAT	
0273				17,3610	0 0006 1	EXTEND		
0274	REF	2	LAST 1453	17,3611	6 3615 0	BZMF	ZONE1	NOT IN SPECIAL ZONES.

R0275 FIRE FOR AXIS OP, IF CLOSE, FIRE MINIMUM IMPULSE. IF ON AXIS, COAST.

0276	REF	1		17,3612	4 1556 1	ZONE2,3	CS	ZONE3LIM	HEIGHT OF MIN-IMPULSE ZONE SET BY 1/ACCS
0277	REF	6	LAST 1455	17,3613	6 1742 1		AD	TTCAXIS	25 MSEC IN DRIFTING FLIGHT
0278				17,3614	0 0116 1		EXTEND		ZERO WHEN TRYING TO ENTER CTS CONTROL.
0279	REF	1		17,3615	6 3611 0		BZMF	ZONE3	
0280	REF	7	LAST 1456	17,3616	31'742 1	ZONE2	CAF	TTCAXIS	FIRE TO AXIS.
0281	REF	3	LAST 1455	17,3617	1 3521 0		TCF	RETURN TJ	
0282	REF	11	LAST 1455	17,3618	11'427 0	ZONE3	CCS	EDCT	CHECK IF EDCT IS ZERO.
0283	REF	67	LAST 1435	17,3611	3 4746 0		CAF	RIT6	FIRE A CNE-JET MINIMUM IMPULSE.
0284	REF	4	LAST 1456	17,3612	1 3521 0		TCF	RETURN TJ	TJET = +0.
0285	REF	23	LAST 1453	17,3613	0 5675 0		TC	CCSFCLC	CANNOT BE BECAUSE NEG EDCT COMPLEMENTED.
0286	REF	5	LAST 1456	17,3614	1 3521 0		TCF	RETURN TJ	TJET = +0.

0287				17,3615	1 0006 1	ZONE1	EXTEND		
0288	REF	10	LAST 1452	17,3616	5 1746 0		INDEX	ADRSDIF1	
0289	REF	2	LAST 1453	17,3617	61'615 0		SL	AXISDIST	SCALED AT PI/4 RAD.
0290				17,3621	0 1005 1		EXTEND		
0291	REF	9	LAST 1455	17,3621	5 1744 1		INDEX	ADRSDIF2	
0292	REF	1		17,3622	7 1575 0		MP	ACCFCTZ1	SCALED AT 2(7)/PI SEC(2)/RAD.
0293				17,3623	20 011 1		EDCURL		
0294				17,3624	20 001 1		EDCLRL		
0295	REF	5	LAST 1455	17,3625	53'751 0		EXCH	HH	DOUBLE PRECISION H SCALED AT 8 SEC(2).

R0296 TEST WHETHER TOTAL TIME REQUIRED GREATER THAN 150 MSEC:

R0297
R0298 IS $.5(1.150 - TTCAXIS)^2 - H$ NEGATIVE (SCALED AT 8 SECONDS)

0299	REF	8	LAST 1456	17,3626	31'742 1	CAF	TTCAXIS	TTCAXIS SCALED AT 4 SECONDS.	
0300	REF	2	LAST 1455	17,3627	6 3773 1	AD	-TJMAX	-.150 SECOND SCALED AT 4.	
0301				17,3630	0 0106 1		EXTEND		
0302				17,3631	7 0000 0		SGLARE		
0303				17,3632	0 0006 1		EXTEND		
0304	REF	10	LAST 1456	17,3632	61'747 1		SL	HH	HIGH WORD OF H SCALED AT 8 SEC(2).
0305				17,3634	0 0106 1		EXTEND		
0306	REF	2	LAST 1455	17,3635	6 3521 0		BZMF	FULLTIME	YES. NEED NOT CALCULATE TJET.

R0307 TEST WHETHER TIME BEYOND AXIS GREATER THAN 50 MSEC TO DETERMINE WHICH APPROXIMATION TO USE.

0308	REF	11	LAST 1456	17,3636	31'747 1	CAF	HH	
0309	REF	1	LAST 1454	17,3637	6 7751 0	AC	NEC2	
0311				17,3640	0 0006 1	EXTEND		

L TJET LAW

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0312 RFF 1 17,3641 6 3651 0 BZMF FORMULA3

R0313 TJET = H/0.1 + TTDAXIS + .0375 FOR APPROXIMATION OVER MORE THAN 50 MSEC.

0315	RFF	1		17,3642	3 3763 0	CAF	.1AT2	STORE .1 SEC SCALED AT 2 FOR DIVISION.
0316	RFF	12	LAST 1456	17,3642	52'750 0	EXCF	HF	CF F SCALED AT 4 SEC(2) NEED NOT BE
0317				17,3644	0 0006 1	EXTEND		PRESERVED.
0318	RFF	13	LAST 1457	17,3645	11'747 0	CV	HF	QUOTIENT SCALED AT 4 SECONDS.
0319	RFF	9	LAST 1456	17,3646	6 1742 1	AD	TTDAXIS	SCALED AT 4 SEC.
0320	RFF	1		17,3647	6 3764 1	AD	.0375AT4	.0375 SEC SCALED AT 4.
0321	RFF	6	LAST 1456	17,3650	1 3521 0	TCF	RETURN TJ	END COMPUTATION.

R0322 TJET = H/0.25 + TTDAXIS FOR APPROXIMATION OVER LESS THAN 50 MSEC.

0323	RFF	1		17,3651	4 3765 1	FORMULA3	CS	- .025AT2	STORE +.025 SEC SCALED AT 2 FOR DIVISION
0324	RFF	14	LAST 1457	17,3652	52'750 0	EXCF	HF	PICK UP CF F AT 8, WHICH NEED NOT BE	
0325				17,3653	0 0006 1	EXTEND		PRESERVED.	
0326	RFF	15	LAST 1457	17,3654	11'747 0	CV	HF	QUOTIENT SCALED AT 4 SECONDS.	
0327	RFF	10	LAST 1457	17,3655	6 1742 1	AD	TTDAXIS	SCALED AT 4 SEC.	

R0328 IF COMPLETED JET TIME IS LESS THAN TJMIN, TJET IS SET TO ZERO.

R0329 MINIMUM IMPULSES REQUIRED IN ZONE 3 ARE NOT SUBJECT TO THIS CONSTRAINT, NATURALLY.

0331	RFF	1		17,3656	6 3775 1	CHKMINTJ	AD	-TJMIN	IS COMPLETED TIME LESS THAN THE MINIMUM.
0332				17,3657	0 0006 1	EXTEND			
0333	RFF	2	LAST 1453	17,3660	6 3455 0	BZMF	CCASTIJ	YES, SET TIME TO ZERO.	
0334	RFF	1		17,3661	6 3774 0	AD	TJMIN	NO, RESTORE COMPUTED TIME.	
0335	RFF	7	LAST 1457	17,3662	1 3521 0	TCF	RETURN TJ	END COMPUTATION.	

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P0336 *** RCLHLAW ***

R0337 BEFORE ENTRY TO RUFLAW:

- R0338 1. INDEXES ACRSDIF1 AND ACRSDIF2 ARE SET ON BASIS OF AXIS, AND SIGN OF EDCT.
 R0340 2. IF EDCT WAS NEGATIVE, F AND EDCT ARE ROTATED INTO UPPER HALF-PLANE AND RCTSENF IS MADE NEGATIVE.
 R0342 3. F IS SCALED AT PI RADIANS AND EDCT AT PI/4 RAD/SEC.
 R0343 (EXCEPT THE RUFLAW3 ENTRY WHEN F IS AT PI/4)

R0344 RUFLAW1: ERROR MORE NEGATIVE THAN PI/16 RAD. FIRE TO A RATE OF 6.5 DEG/SEC (IF JET TIME EXCEEDS 20 MSEC.).

R0346 RUFLAW2: ERROR MORE POSITIVE THAN PI/16 RAD. FIRE TO AN OPPOSING RATE OF 6.5 DEG/SEC.

R0348 RUFLAW3: ERROR RATE GREATER THAN PI/32 RAD/SEC AND ERROR WITHIN COUNTS. COAST IF BELOW FIREPCT, FIRE IF ABOVE

R0350	REF	1			17,3663	4 3776 0	RUFLAW1	CS	RLFRATE	DECREMENT EDCT BY .1444 RAD/SEC AT PI/4
R0351	REF	12	LAST	1456	17,3664	271427 0		ACS	EDCT	WHICH IS THE TARGET RATE
R0352					17,3665	0 0006 1		EXTEND		
R0353	REF	1			17,3666	6 3707 1		BZMF	SMALRATE	BRANCH IF RATE LESS THAN TARGET.
R0354	REF	1			17,3667	0 3745 1		TC	RUFSETUP	REVERSE ROTSENF AND INDICATE MAX JETS.
R0355	REF	13	LAST	1456	17,3670	311427 1		CAF	EDCT	PICK UP DESIRED RATE CHANGE.
R0356					17,3671	0 0006 1	RUFLAW12	EXTEND		COMPUTE TJET
R0357	REF	10	LAST	1456	17,3672	5 1744 1		INDEX	ACRSDIF2	=(DESIRED RATE CHANGE)/(2-JET ACCEL.)
R0358	REF	10	LAST	1456	17,3673	7 1771 1		MP	1/ANET1 +2	
R0359	REF	3	LAST	987	17,3674	6 7744 1		AD	-1/8	IF TJET, SCALED AT 32 SEC, EXCEEDS
R0360					17,3675	0 0006 1		EXTEND		4 SECONDS, SET TJET TO TJMAX.
R0361					17,3676	6 3707 0		RZMF	+2	
R0362	REF	3	LAST	1456	17,3677	1 3520 1		TCF	FULLTIME	
R03621					17,3700	0 0006 1		EXTEND		
R03622	REF	4	LAST	1456	17,3701	1 3520 1		BZF	FLLTIME	
R0363	REF	40	LAST	1427	17,3702	6 4740 0		AC	BIT12	RESTORE COMPLETED TJET TO ACCUMULATOR.
R0364	REF	518	LAST	1451	17,3703	20 301 1		CAS	A	
R0365	REF	519	LAST	1458	17,3704	20 301 1		CAS	A	
R0366	REF	520	LAST	1456	17,3705	20 301 1		CAS	A	REFSCALED TJET AT 4 SECONDS.
R0367	REF	2	LAST	1455	17,3706	1 3656 0		TCF	CHKMIATJ	RETURN AS FROM FINELAW.
R0368	REF	2	LAST	1458	17,3707	0 3747 0	SMALRATE	TC	RUFSETUP +2	SET NLMBERT AND FIREFCT FOR MAXIMUM JETS
R0369	REF	7	LAST	1455	17,3710	117740 1		CCS	RTSENF	
R0370	REF	172	LAST	1445	17,3711	3 4753 1		CAF	ONE	MODIFY INDEXER TO POINT TO 1/ANET
R0371					17,3712	1 3714 1		TCF	+2	CORRESPONDING TO THE PROPER SENSE.
R0372	REF	13	LAST	1276	17,3713	3 7752 0		CAF	NEGCAF	
R0373	REF	11	LAST	1458	17,3714	271744 0		ACS	ACRSDIF2	
R0374	REF	14	LAST	1456	17,3715	4 1427 0		CS	EDCT	(.144 AT PI/4 - EDCT)=DESIRED RATE CHNG.
R0375	REF	1			17,3716	1 3671 0		TCF	RLFLAW12	
R0376	REF	3	LAST	1456	17,3717	0 3745 1	RLFLAW2	TC	RUFSETUP	REVERSE ROTSENF AND INDICATE MAX JETS.
R0377	REF	2	LAST	1456	17,3720	3 3776 1		CAF	RUFRATE	
R0378	REF	15	LAST	1456	17,3721	6 1427 1		AD	EDCT	(.144 AT PI/4 + EDCT)=DESIRED RATE CHNG.
R0379	REF	521	LAST	1456	17,3722	54 000 0		TS	A	IF OVERFLOW SKIP, FIRE FOR FULL TIME.
R0380	REF	2	LAST	1456	17,3723	1 3671 0		TCF	RUFLAW12	OTHERWISE, COMPUTE JET TIME.
R0381	REF	5	LAST	1458	17,3724	1 3520 1		TCF	FLLTIME	

L TJFT LAW

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0382	REF	4	LAST	1456	17,3725	0 2745 1	RUFLAW3	TC	RUFSETUP
0383	REF	11	LAST	1456	17,3726	51*746 0		INDEX	ACRSDIF1
0384	REF	4	LAST	1452	17,3727	4 1601 0		CS	FIRFEE
0385	REF	16	LAST	1452	17,3730	6 1752 0		AD	"
0386					17,3731	0 0006 1		EXTEND	
0387	REF	22	LAST	1454	17,3732	7 4741 0		MP	BIT11
0388	REF	16	LAST	1458	17,3733	57*427 1		XCH	ECOT
0389					17,3734	0 0006 1		EXTEND	
0390					17,3735	7 0000 0		SQARF	
0391					17,3736	1 0006 1		EXTEND	
0392	REF	12	LAST	1459	17,3737	5 1746 0		INDEX	ACRSCIF1
0393	REF	11	LAST	1458	17,3740	7 1571 1		MP	1/ANCT1 +2
0394	REF	17	LAST	1459	17,3741	6 1427 1		AD	ECOT
0395					17,3742	0 0006 1		EXTEND	
0396	REF	4	LAST	1457	17,3743	6 3455 0		PZMF	COASTIJ
0397	REF	6	LAST	1458	17,3744	1 3520 1		TCF	FULLTIME

EXECUTE COMMON RUFLAW SUBROUTINE.

CALCULATE DISTANCE FROM SWITCH CURVE
 $1/ANCT1*ECOT*ECOT + E - FIRFEE = 0$
 SCALED AT 4 PI RADIAN

COAST IF BELOW IT.
 FIRE FOR FULL PERIOD IF ABOVE IT.

R0398 SLEPROUTINE USED IN ALL ENTRIES TO ROUGHLAW.

0399	REF	8	LAST	1456	17,3745	4 1740 1	RUFSETUP	CS	RTSENSE
0400	REF	9	LAST	1459	17,3746	55*740 1		TS	RTSENSE
0401	REF	46	LAST	1455	17,3747	3 4751 0	+2	CAF	FOUR
0402	REF	19	LAST	1455	17,3750	55*743 1		TS	NUMBERT
0403	REF	11	LAST	1449	17,3751	3 4735 1		CAF	NFGMAX
0404	REF	7	LAST	1456	17,3752	55*741 0		TS	FIREFOT
0405	REF	417	LAST	1449	17,3753	0 0002 0		TC	C

REVERSE RTSSENSE WHEN ENTER HERE.

REQUIRE MAXIMUM (2) JETS IN U,V-AXES.

SUGGEST MAXIMUM (4) JETS IN P-AXIS.

R0416 CONSTANTS FOR TJFTLAW

0407					17,3754	77757 1		DEC	-16
0408					17,3755	00000 1	AXISDIFF	DEC	+0
0409					17,3756	00020 0		DEC	16
0410					17,3757	14400 0	SENSE	CCT	14400
0411					17,3760	75673 1	-2DEC	DEC	-.06667
0412					17,3761	77750 0	-.011208	DEC	-.00141
0413					17,3762	00632 0	.1AT4	DEC	.025
0414					17,3763	01463 1	.1AT2	DEC	.05
0415					17,3764	00232 1	.0375AT4	DEC	.00938
0416					17,3765	77462 1	-.025AT2	DEC	-.0125
0417					17,3766	77631 0	-.025AT4	DEC	-.00625
0418					17,3767	77145 1	-.05AT2	DEC	-.025
0419					17,3770	75462 0	-.15AT2	DEC	-.075
0420					17,3771	00007 0	.0037508	2DEC	.00375 B-3
0421					17,3772	25665 0			
0422					17,3773	76631 1	-TJMAX	DEC	-.0375
0423					17,3774	00122 0	TJMIN	DEC	.005
0424					17,3775	77655 1	-TJMIN	DEC	-.005
0425					17,3776	04470 0	RLFRATE	DEC	.1444

AXISDIFF(INDEX) = NUMBER OF REGISTERS
 BETWEEN STORED 1/ACCS PARAMETERS FOR
 THE INDEXED AXIS AND THE U-AXIS.
 RATIO OF TJET SCALING WITHIN TJFTLAW
 (4 SEC) TO SCALING FOR T6 (10.24 SEC).

-3.0 DEGREES SCALED AT 45.
 -.01125 SEC(2) SCALED AT 8.
 0.1 SECCND SCALED AT 4.
 0.1 SEC SCALED AT 2.
 .0375 SEC SCALED AT 4.
 -.025 SEC SCALED AT 2.

LARGEST CALCULATED TIME. .150 SEC AT 4.
 SMALLEST ALLOWABLE TIME. .020 SEC AT 4.
 CORRESPONDS TO TARGET RATE OF 6.5 DEG/S.

L KALMAN FILTER

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0001 REF 3 LAST 1445 F6,1522 EBANK= NO.UJETS
 0002 16,3645 BANK 16
 0003 REF 3 LAST 1411 16,2700 SETLCC DAPS1
 0004 16,3645 BANK

0005 REF 1 CCNT# \$1/CAP

0006 REF 103 LAST 1454 16,3645 3 4752 0 RATELOOP CA TW
 0007 REF 3 LAST 134 16,3646 551744 0 TS DAPTEMP6

00071 16,3647 6 0000 1 CCCLBLE

00072 REF 418 LAST 1459 16,3650 54 0 2 1 TS Q

0008 REF 4 LAST 1460 16,3651 511744 1 INCFX DAPTEMP6

0009 REF 14 LAST 1450 16,3652 111524 1 CCS TJP

0010 16,3653 1 3655 0 TCF +2

0011 REF 1 16,3654 1 3674 0 TCF LCCPRATE

0012 REF 1 16,3655 6 3735 0 AD -100NST6

0013 16,3656 0 0006 1 EXTEND

0014 REF 1 16,3657 6 3713 1 RZMF SMALLTJU

0015 REF 5 LAST 1460 16,3660 511744 1 INDEX DAPTEMP6

0016 REF 15 LAST 1460 16,3661 111524 1 CCS TJP

0017 REF 2 LAST 1460 16,3662 3 3735 0 CA -100NST6

0018 16,3663 1 3665 0 TCF +2

0019 REF 3 LAST 1460 16,3664 4 3735 1 CS -100NST6

0020 REF 6 LAST 1460 16,3665 511744 1 INDEX DAPTEMP6

0021 REF 16 LAST 1460 16,3666 271524 1 ADS TJP

0022 REF 7 LAST 1460 16,3667 511744 1 INDEX DAPTEMP6

0023 REF 17 LAST 1460 16,3670 111524 1 CCS TJP

0024 REF 1 16,3671 4 3621 0 CS -100NS

0025 16,3672 1 3674 0 TCF +2

0026 REF 2 LAST 1460 16,3673 3 3621 1 CA -100MS

0027 16,3674 0 0006 1 LCCPRATE EXTEND

0028 REF 8 LAST 1460 16,3675 5 1744 1 INDEX DAPTEMP6

0029 REF 3 LAST 1427 16,3676 7 1521 1 MP NO.UJETS

0030 REF 293 LAST 1454 16,3677 3 0001 0 CA L

0031 REF 9 LAST 1460 16,3700 511744 1 INDEX DAPTEMP6

00311 REF 29 LAST 1441 16,3711 551737 1 TS DAPTEMP1

00312 16,3702 0 0006 1 EXTEND

00313 REF 51 LAST 1400 16,3703 7 4742 0 MP BIT10

00314 16,3704 0 0006 1 EXTEND

00315 REF 1 16,3705 6 3736 0 RZMF NEGTCRK

00316 REF 419 LAST 1460 16,3706 50 002 0 STORTCRK

00317 REF 7 LAST 134 16,3707 271513 0 ADS DOWNTCRK

0032 REF 10 LAST 1460 16,3710 111744 0 CCS DAPTEMP6

0033 REF 2 LAST 1418 16,3711 1 3646 1 TCF RATELOOP +1

0034 REF 1 16,3712 1 2722 1 TCF PCTORQUE

0035 REF 372 LAST 1453 16,3713 3 4755 1 SMALLTJU

0036 REF 11 LAST 1460 16,3714 511744 1 INDEX DAPTEMP6

0037 REF 19 LAST 1460 16,3715 571524 0 XCH TJP

0038 16,3716 6 0006 1 EXTEND

C.1 A1 1

SIGNED TORQUE AT 1 JET-SEC FOR FILTER

RESCALE TC 32; CNE PIT ACPLT 2 JET-MSEC

INCREMENT DOWNLIST REGISTER.

NOTE: NOT INITIALIZED; EVERFLWS.

L KALMAN FILTER

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0039	REF	4	LAST 1091	16,3717	7 4765 0	MP	ELEVEN	10.24 FLUS
0040	REF	254	LAST 1460	16,3720	3 0001 0	CA	L	
0041	REF	2	LAST 1460	16,3721	1 2674 0	TCF	LCCPPATE	
0042	REF	11	LAST 1441	16,3722	3 1740 0	CA	DAPTEMP2	
0043	REF	7	LAST 1437	16,3723	6 1741 1	AD	DAPTEMP3	
0044				16,3724	0 0006 1	EXTEND		
0045	REF	1		16,3725	7 1532 0	MP	1JACCP	
0046	REF	3	LAST 1417	16,3726	55 1747 0	TS	JETRATEF	
0047	REF	8	LAST 1461	16,3727	4 1741 0	CS	DAPTEMP3	
0048	REF	12	LAST 1461	16,3730	6 1740 0	AD	DAPTEMP2	
0049				16,3731	0 0006 1	EXTEND		
0050	REF	1		16,3732	7 1531 0	MP	1JACCG	
0051	REF	3	LAST 1416	16,3733	55 1746 1	TS	JETRATEG	
0052	REF	1		16,3734	1 2316 0	TCF	BACKP	
0053				16,3735	77537 0	-100MST6	DEC	-160
0054								
0055				16,3736	4 0001 0	NEGTOCK	CON	
0056	REF	420	LAST 1460	16,3737	24 0002 0	INCR	0	
0057	REF	1		16,3740	1 3706 1	TCF	STCPTCRK	

L TRIM GIMBAL CONTROL SYSTEM

LSEP'S PAGE NO. 1 EQ S4

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0001          21,3070          BANK 21
0002 REF 1          56,1450          EBANK= QDIFF
0003 REF 1          21,2000          SETLCC PARS4
0004          21,2070          BANK

00045 REF 1          COUNT* $1/DARGT

R0005 CONTROL REACHES THIS POINT UNDER EITHER OF THE FOLLOWING TWO CONDITIONS ONCE THE DESCENT ENGINE AND THE DIGITAL
R0007 AUTOPILCT ARE BOTH ON:
R0008 A) THE TRIM GIMBAL CONTROL LAW WAS ON DURING THE PREVIOUS G,R-AXIS TIMES INTERRUPT (OR THE CAPIDLER
R0010 INITIALIZATION WAS SET FOR TRIM GIMBAL CONTROL AND THIS IS THE FIRST PASS), OR
R0012 B) THE G,R-AXES RCS AUTOPILCT DETERMINEC THAT THE VEHICLE WAS ENTERING (OR HAD JUST ENTERED) A COAST
R0014 ZONE WITH A SMALL OFFSET ANGULAR ACCELERATION.

R0015 GTS IS THE ENTRY TO THE GIMBAL TRIM SYSTEM FOR CONTROLLING ATTITUDE ERRORS AND RATES AS WELL AS ACCELERATIONS.

0018 REF 14 LAST 1458 21,3070 3 7752 0 GTS CAF NEGONE MAKE THE NEXT PASS THROUGH THE CAP RE
0019 REF 6 LAST 1442 21,3071 55'631 0 TS CCTRLER THROUGH RCS CONTROL,
0020 REF 47 LAST 1459 21,3072 3 4751 0 CAF FOUR AND ENSURE THAT IT IS NOT A SKIP.
0021 REF 9 LAST 1445 21,3073 55'535 1 TS SKIPU
0022 REF 3 LAST 1445 21,3074 55'536 1 TS SKIPV

00225 REF 104 LAST 1460 21,3075 3 4752 0 CAF TWO
0023 REF 5 LAST 1445 21,3076 55'633 1 TS INGTS SET INDICATOR OF GTS CONTROL POSITIVE.
0024 REF 7 LAST 1419 21,3077 55'632 0 TS QGIMTMR SET TIMERS TO 200 MSEC TO AVOID BOTH
0025 REF 5 LAST 1419 21,3100 55'634 0 TS RGIMTMR RUNAWAY AND INTERFERENCE BY NULLING.

R0026 THE DRIVE SETTING ALGORITHM

R0027 DFL = SIGN(OMEGA + ALPHA*ABS(ALPHA)/(2*K))

R0028
R0030 NEGUSUM = ERROR*K + ALPHA*(DEL*OMEGA + ALPHA / (2*K)) + DEL*K (DEL*OMEGA + ALPHA / (2*K))
R0032 DRIVE = -SIGN(NEGUSUM)

0033 REF 27 LAST 1295 21,3101 3 0021 1 CA SR SAVE THE SR. SHIFT IT LEFT TO CORRECT
0034 REF 522 LAST 1458 21,3102 6 0000 1 AD A FOR THE RIGHT SHIFT DUE TO EDITING.
0035 REF 1 21,3103 55'505 1 TS SAVESR

0036 REF 105 LAST 1462 21,3104 3 4752 0 GTSGC+CA CAF TWO SET INDEXER FOR R-AXIS CALCULATIONS.
0037 REF 1 21,3105 1 3107 0 TCF GQOTPRNG +1

0038 REF 303 LAST 1460 21,3106 3 4755 1 GCGTFRNG CAF ZERO SET INDEXER FOR Q-AXIS CALCULATIONS
0039 REF 1 21,3107 55'750 0 TS QRCNTR

0040 REF 2 LAST 1462 21,3110 51'750 1 INDEX QRCNTR AOS SCALED AT PI/2
0041 REF 23 LAST 1431 21,3111 3 1537 1 CA ACSQ
0042 21,3112 0 0006 1 EXTEND
0043 REF 53 LAST 1434 21,3113 7 4752 1 MP BIT2 RESCALE ACS TO PI/4

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L TRIM GIMBAL CONTROL SYSTEM

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0044				21,3114	1 0006 1	EXTEND		
0045	REF	1		21,3115	1 3121 1	RZF	GTSQAXIS -3	USE FULL SCALE FOR LARGER ADS ESTIMATES.
0046	REF	523	LAST 1462	21,3116	50 000 1	INDEX	A	
0047	REF	10	LAST 1447	21,3117	4 4734 1	CS	LIMITS	LIMITS +1 CONTAINS NEGMAX.
0048	REF	295	LAST 1461	21,3120	56 801 0	XCH	L	LIMITS -1 CONTAINS POSMAX.
0049	REF	3	LAST 1462	21,3121	11 750 0	CCS	QPCNTR	PICK UP RATE FOR THIS AXIS. RATE CELLS
0050	REF	524	LAST 1463	21,3122	50 000 1	INDEX	A	ARE ADJACENT, NOT SEPARATED. AT PI/4
0051	REF	5	LAST 1432	21,3123	3 1436 1	CA	FFCTG	
0052	REF	1		21,3124	53 744 0	GTSQAXIS	EXCH	WCENTRAL
0053	REF	4	LAST 1463	21,3125	51 751 1	INDEX	QPCNTR	
0054	REF	3	LAST 133	21,3126	3 1504 1	CA	KC	COLLECT K FOR THIS AXIS
0055	REF	1		21,3127	55 741 0	TS	KCENTRAL	
0056				21,3130	0 0006 1	EXTEND		
0057	REF	1		21,3131	1 3567 1	RZF	POS DRIVE +1	CONTROL AUTHORITY ZERO. AVOID DRIVING
0058	REF	5	LAST 1463	21,3132	51 750 1	INDEX	QPCNTR	ENGINE PELL TO THE STOPS.
0059	REF	2	LAST 1462	21,3133	21 450 1	CAE	QDIFF	QDIFF, RDIFF ARE STORED IN D.P.
0060				21,3134	0 0006 1	ALGORITHM	EXTEND	
0061	REF	2	LAST 1463	21,3135	7 1741 0	MP	KCENTRAL	Q(R)DIFF IS THETA (ERRCR) SCALED AT PI.
0062	REF	1		21,3136	23 737 0	LXCH	K2THETA	FROM K*ERRCR AT PI(2)/2(8), IN D.P.
0063				21,3137	0 0006 1	EXTEND		
0064	REF	52	LAST 1451	21,3140	7 4747 0	MP	BIT5	RESCALE TO 4*PI(2)
0065	REF	2	LAST 1463	21,3141	53 741 1	EXCH	K2THETA	
0066				21,3142	0 0006 1	EXTEND		
0067	REF	53	LAST 1463	21,3143	7 4747 0	MP	BIT5	FIRST TERM OF NEELSUM IN K2THETA.
0068	REF	3	LAST 1463	21,3144	27 740 1	ADS	K2THETA +1	NO CARRY NEEDED D.P. AT 4*PI(2)
0069	REF	1		21,3145	4 1744 0	CS	ACENTRAL	
0070				21,3146	0 0006 1	EXTEND		
0071	REF	85	LAST 1455	21,3147	7 4736 0	MP	BIT14	FROM ALPHA(2)/(2*K) AT 16*PI, IN D.P.,
0072				21,3150	0 0006 1	EXTEND		LIMITING COEFFICIENT TO AVOID OVERFLOW.
0073	REF	2	LAST 1463	21,3151	7 1744 0	MP	ACENTRAL	-ALPHA/2 IN A, SCALED AT PI/4
0074	REF	3	LAST 1463	21,3152	6 1741 1	AD	KCENTRAL	
0075				21,3153	0 0006 1	EXTEND		-ALPHA(2)/2 IN A, L, SCALED AT PI(2)/16
0076	REF	1		21,3154	6 3171 0	RZMF	FUGCOUNT	K-ALPHA(2)/2 SHOULD BE RAZ FC DIVISION
0077				21,3155	0 0006 1	EXTEND		
0078	REF	525	LAST 1463	21,3156	4 0001 1	CCS	A	
0079	REF	4	LAST 1463	21,3157	6 1741 1	AD	KCENTRAL	ALPHA(2)/2 - K
0080				21,3160	0 0006 1	EXTEND		
0081	REF	5	LAST 1463	21,3161	11 741 0	CV	KCENTRAL	HIGH ORDER OF COEFFICIENT.
0082	REF	1		21,3162	57 746 0	XCH	A2CENTRAL	
0083	REF	296	LAST 1463	21,3163	3 0001 0	CA	L	SHIFT OF THE REMAINDER.
0084				21,3164	22 007 0	LXCH	7	ZERO LOW-ORDER DIVIDEND.
0085				21,3165	0 0006 1	EXTEND		

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0086	REF	6	LAST 1463	21,3166	11'741 0	CV	KCENTRAL	
0087	REF	2	LAST 1463	21,3167	57'747 1	XCH	A2CENTRAL +1	DUCTIENT STORED AT 16*PI , D.P.
0088	REF	1		21,3170	1 3174 1	TCF	HAVEGLOT	
0089	REF	35	LAST 1412	21,3171	3 4733 1	HUGEGLCT CA	PCSMAX	
0090	REF	297	LAST 1463	21,3172	54'741 1	TS	L	
0091	REF	3	LAST 1464	21,3173	53'747 0	EXCH	A2CENTRAL	LIMITED DUCTIENT STORED AT 16*PI, C.P.
0092	REF	2	LAST 1463	21,3174	3 1743 0	HAVEGLCT CA	WCENTRAL	
0093				21,3175	0 0006 1	EXTEND		
0094	REF	35	LAST 1436	21,3176	7 4743 1	MP	B1T9	RESCALE OMEGA AT 16*PI IN D.P.
0095	REF	1		21,3177	53'743 1	EXCH	K2CENTRAL	LOWER WORD OVERLAYS OMEGA IN WCENTRAL
0096				21,3200	0 0006 1	EXTEND		
0097	REF	2	LAST 1464	21,3201	3 1743 0	CCA	K2CENTRAL	
0098	REF	1		21,3202	52'752 1	EXCH	FUNCTION	
0099	REF	3	LAST 1463	21,3203	3 1744 1	CA	ACENTRAL	GET ALPHA*ABS(ALPHA)/(2*K)
0100				21,3204	0 0006 1	EXTEND		
0101				21,3205	6 3211 0	BZMF	+4	
0102				21,3206	0 0006 1	EXTEND		
0103	REF	4	LAST 1464	21,3207	3 1747 1	CCA	A2CENTRAL	
0104				21,3210	1 3213 0	TCF	+3	
0105				21,3211	0 0006 1	EXTEND		
0106	REF	5	LAST 1464	21,3212	4 1747 0	CCS	A2CENTRAL	
0107	REF	2	LAST 1464	21,3213	21'752 1	CAS	FUNCTION	OMEGA + ALPHA*ABS(ALPHA)/(2*K) AT 16*PI
0108	REF	3	LAST 1464	21,3214	11'751 1	CCS	FUNCTION	DEL = +1 FOR FUNCT1 GREATER THAN ZERO.
0109	REF	1		21,3215	1 3221 1	TCF	POSFACT1	OTHERWISE DEL = -1
0110				21,3216	1 3220 0	TCF	+2	
0111	REF	1		21,3217	1 3223 0	TCF	NEGFACT1	
0112	REF	4	LAST 1464	21,3220	11'752 1	CCS	FUNCTION +1	USE LOW ORDER WORD SINCE HIGH IS ZERO
0113	REF	64	LAST 1451	21,3221	3 4753 1	POSFACT1	CAF	
0114				21,3222	1 3224 1	TCF	+2	
0115	REF	65	LAST 1464	21,3223	4 4753 0	NEGFACT1	CS	
0116	REF	1		21,3224	55'745 1	TS	B1T1	
0117							DEL	
0118	REF	2	LAST 1464	21,3225	11'745 1	CCS	DEL	REPLACE OMEGA BY DEL*OMEGA
0119	REF	1		21,3226	1 3240 0	TCF	FUNCT2	POSITIVE DEL VALUE. PROCEED.
0120	REF	1		21,3227	1 3221 0	TCF	DEFUNCT	
0121	REF	1		21,3230	1 3235 1	TCF	NEGFACT2	
0121	REF	3	LAST 1464	21,3231	55'742 0	DEFUNCT	TS	K2CENTRAL
0122	REF	4	LAST 1464	21,3232	55'743 1	TS	K2CENTRAL +1	
0123	REF	2	LAST 1464	21,3233	1 3240 0	TCF	FUNCT2	

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0124				21,3234	65252 1	NEG1/3	DEC	- .33333	
0125				21,3235	0 0006 1	NEGFNCT2	EXTEND		
0126	REF	5	LAST 1464	21,3236	4 1743 1		DCS	K2CENTRAL	
0127	REF	6	LAST 1465	21,3237	53'743 1		DXCH	K2CENTRAL	
0128				21,3240	0 0006 1	FLNCT2	EXTEND		
0129	REF	6	LAST 1464	21,3241	3 1747 1		CCA	A2CENTRAL	
0130	REF	7	LAST 1465	21,3242	21'743 1		CAS	K2CENTRAL	DEL*OMEGA + ALPHA(2)/(2*K) AT 16*PI, C.P.
0131	REF	7	LAST 1465	21,3242	3 1746 0	FLNCT3	CA	A2CENTRAL	
0132				21,3244	0 0006 1		EXTEND		
0133	REF	1		21,3245	7 3234 0		MP	NEG1/3	
0134	REF	8	LAST 1465	21,3246	53'747 0		DXCH	A2CENTRAL	
0135	REF	298	LAST 1464	21,3247	3 0001 0		CA	L	
0136				21,3250	0 0006 1		EXTEND		
0137	REF	2	LAST 1465	21,3251	7 3234 0		MP	NEG1/3	
0138	REF	9	LAST 1465	21,3252	27'747 0		ADS	A2CENTRAL +1	
0139	REF	250	LAST 1465	21,3252	54 001 1		TS	L	
0140				21,3254	1 3256 1		TCF	+2	A2CENTRAL NOW CONTAINS -ALPHA(2)/(6*K), SCALED AT 16*PI, IN D.P.
0141	REF	10	LAST 1465	21,3255	27'746 1		ADS	A2CENTRAL	
0142				21,3256	0 0006 1		EXTEND		
0143	REF	8	LAST 1465	21,3257	3 1743 0		CCA	K2CENTRAL	DEL*OMEGA + ALPHA(2)/(3*K) IN A2CENTRAL, SCALED AT 16*PI, D.P.
0144	REF	11	LAST 1465	21,3260	21'747 0		CAS	A2CENTRAL	
0145	REF	12	LAST 1465	21,3261	3 1746 0		CA	A2CENTRAL	
0146				21,3262	0 0006 1		EXTEND		
0147	REF	4	LAST 1464	21,3263	7 1744 0		MP	ACENTRAL	
0148	REF	4	LAST 1463	21,3264	21'740 1		CAS	K2THETA	
0149	REF	13	LAST 1465	21,3265	3 1747 1		CA	A2CENTRAL +1	
0150				21,3266	0 0006 1		EXTEND		
0151	REF	5	LAST 1465	21,3267	7 1744 0		MP	ACENTRAL	ACENTRAL MAY NOW BE OVERLAID.
0152	REF	5	LAST 1465	21,3270	27'740 1		ADS	K2THETA +1	
0153	REF	200	LAST 1465	21,3271	54 001 1		TS	L	
0154				21,3272	1 3274 1		TCF	+2	TWO TERMS OF NEGUSUM ACCUMULATED, SC FAR SCALED AT 4*PI(2), IN C.P.
0155	REF	6	LAST 1465	21,3273	27'737 1		ADS	K2THETA	
0156	REF	9	LAST 1465	21,3274	3 1742 1	GETFOOT	CA	K2CENTRAL	K*(DEL*OMEGA + ALPHA(2)/(2*K)) IS THE TERM FOR WHICH A SQUARE ROOT IS NEEDED.
0157				21,3275	0 0006 1		EXTEND		K AT PI/2(8)
0158	REF	7	LAST 1464	21,3276	7 1741 0		MP	KCENTRAL	
0159	REF	5	LAST 1464	21,3277	53'752 1		DXCH	FUNCTION	
0160	REF	10	LAST 1465	21,3310	3 1743 0		CA	K2CENTRAL +1	
0161				21,3311	0 0006 1		EXTEND		
0162	REF	8	LAST 1465	21,3312	7 1741 0		MP	KCENTRAL	
0163	REF	6	LAST 1465	21,3313	27'752 1		ADS	FUNCTION +1	
0164	REF	311	LAST 1465	21,3314	54 001 1		TS	L	
0165				21,3315	1 3307 1		TCF	+2	
0166	REF	7	LAST 1465	21,3316	27'751 1		ADS	FUNCTION	DESIRED TERM IN FUNCTION, AT PI(2)/16

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0167	PFF	3	LAST 1464	21,3317	11'745 1	CCS	DEL
0168	REF	1		21,3310	1 3515 1	TCF	RSTCFCTS
0169	REF	1		21,3311	1 3557 1	TCF	NEGUSUM
0170	REF	1		21,3312	1 3314 1	TCF	NEGATE
0171	REF	2	LAST 1466	21,3313	1 3557 1	TCF	NEGUSUM
0172				21,3314	1 0006 1	NEGATE	EXTEND
0173	REF	11	LAST 1465	21,3315	4 1743 1	CCS	K2CENTRAL
0174	REF	12	LAST 1466	21,3316	53'743 1	DXCH	K2CENTRAL
0175	REF	2	LAST 1466	21,3317	1 3515 1	TCF	RSTCFCTS
0176				16,3741		BANK	16
0177	REF	5	LAST 1418	16,1511		EBANK=	NEGUG
0178	REF	4	LAST 1460	16,2000		SETLCC	DAPS1
0179				16,3741		BANK	

R0180 THE WRCN12 SUBROUTINE SETS BITS 9,10,11,12 OF CHANNEL 12 ON THE BASIS OF THE CONTENTS OF NEGUG,NEGUR WHICH ARE
 R0182 THE NEGATIVES OF THE DESIRED ACCELERATION CHANGES. ACCT+C12 SETS G(P)ACCT TO REFLECT THE NEW DRIVES.

R0184 WARNING: ACCT+C12 AND WRCN12 MUST BE CALLED WITH INTERRUPT INHIBITED.

0185				16,3741	07400 1	RGIM	CCTAL 07400
0186	REF	8	LAST 1290	166		CHNL12	EQUALS ITEM6
0187	REF	6	LAST 1466	16,3742	4 1501 0	ACCT+C12	CS NEGUG
0188				16,3743	0 0006 1		EXTEND
0189	REF	4	LAST 132	16,3744	7 1507 0	MP	ACCDCTC
0190	REF	4	LAST 1418	16,3745	23'510 1	LXCH	RACCDCT
0191	REF	3	LAST 1410	16,3746	4 1503 1	CS	NEGUR
0192				16,3747	0 0006 1		EXTEND
0193	REF	1		16,3750	7 1511 1	MP	ACCDCTR
0194	REF	4	LAST 1419	16,3751	23'512 0	LXCH	RACCDCT
0195	REF	7	LAST 1466	16,3752	11'501 0	CCS	NEGUG
0196	REF	52	LAST 1460	16,3753	3 4742 1	CAF	BIT10
0197				16,3754	1 3756 1	TCF	+2
0198	REF	36	LAST 1464	16,3755	3 4743 0	CAF	BIT9
0199	REF	1		16,3756	54 066 0	TS	CHNL12
0200	REF	4	LAST 1466	16,3757	11'503 1	CCS	NEGUR
0201	REF	41	LAST 1458	16,3760	3 4740 0	CAF	BIT12
0202				16,3761	1 2763 1	TCF	+2
0203	REF	33	LAST 1459	16,3762	3 4741 1	CAF	BIT11
0204	REF	2	LAST 1466	16,3763	26 066 0	ADS	CHNL12
0205	REF	1		16,3764	4 3741 1	CS	RGIM
0206				16,3765	0 0006 1		EXTEND
0207	REF	71	LAST 1419	16,3766	02 512 0	PAND	CHAN12
0208	REF	3	LAST 1466	16,3767	6 0066 1	AD	CHNL12
0209				16,3770	0 0006 1		EXTEND
0210	REF	72	LAST 1466	16,3771	01 512 0	WRITE	CHAN12

GIMBAL DRIVE REQUESTS.

(STORED RESULT NOT USED AT PRESENT)

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R0211

0212 RFF 2 LAST 1418 16,3772 4 4747 0

0213 RFF 52 LAST 1438 16,3773 7 1262 1

0214 RFF 53 LAST 1467 16,3774 55 1262 1

CS CALLGMBL

MASK RCSFLAGS

TS RCSFLAGS

TURN OFF REQUEST FOR ACCT+012 EXECUTION.

0215 RFF 421 LAST 1461 16,3775 0 0002 0

TC Q

RETURN TO CALLER.

0216 21,3320

0217 RFF 3 LAST 1462 16,1450

0218 RFF 2 LAST 1462 21,3311

0219 21,3320

BANK 21

EBANK= GCTFF

SETLOC DAPS4

BANK

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R0220 SUBROUTINE TIMEGMBL: MOD 1, OCTOBER 1967, CRAIG WORK

R0221 TIMEGMBL COMPUTES THE DRIVE TIME NEEDED FOR THE TRIM GIMBAL TO POSITION THE DESCENT ENGINE NOZZLE SO AS TO NULL
 R0223 THE OFFSET ANGULAR ACCELERATION ABOUT THE G (OR R) AXIS. INSTEAD OF USING ACSQ(R), TIMEGMBL USES .4*ACSQ(R),
 R0225 SCALED AT $\pi/8$. FOR EACH AXIS, THE DRIVE TIME IS COMPUTED AS $ABS(ALPHA/ACCDOT)$. A ZERO
 R0227 ALPHA OR ACCDOT OR A ZERO QUOTIENT TURNS OFF THE GIMBAL DRIVE IMMEDIATELY. OTHERWISE, THE GIMBAL IS TURNED ON
 R0229 DRIVING IN THE CORRECT DIRECTION. THE Q(R)GIMTIME IS SET TO TERMINATE THE DRIVE AND Q(R)ACCDOT
 R0231 IS STORED TO REFLECT THE NEW ACCELERATION DERIVATIVE. NEGQU(R) WILL CONTAIN +1,+0,-1 FOR A Q(R)ACCDOT VALUE
 R0233 WHICH IS NEGATIVE, ZERO, OR POSITIVE.

R0234 INPUTS: ADSQ,ADSR, SCALED AT $\pi/2$, AND ACCDOTG, ACCDOTR AT $\pi/2(7)$. FI/2(7).

R0236 OUTPUTS: NEW GIMBAL DRIVE BITS IN CHANNEL 12, NEGUG, NEGUR, QACCDOT AND RACCDOT, THE LAST SCALED AT $\pi/2(7)$.
 R0238 Q(R)GIMTIME WILL BE SET TO TIME AND TERMINATE GIMBAL DRIVE(S)

R0239 DEPRIS: A,L,G, ITEMS 2,3,6, RUPTRG2 AND ACCT+C12 DEPRIS.

R0240 EXITS: VIA TO 0.

R0241 ALARMS, AFOPTS, : NONE

R0242 SUBROUTINES: ACCT+C12, TRNKCALL

R0243 WARNING: THIS SUBROUTINE WRITES INTO CHANNEL 12 AND USES THE ITEMS. THEREFORE IT MAY ONLY BE CALLED WITH
 R0245 INTERRUPT INHIBITED.

R0246 ERASABLE STORAGE CONFIGURATION (NEEDED BY THE INDEXING METHODS):

A0247					NEGUG	ERASE	+2		NEGATIVE OF G-AXIS GIMBAL DRIVE
A0248					(SPWCRD)	EQUALS	NEGUG +1		ANY S.P. ERASABLE NUMBER, NEW TRPSTCND
A0249					NEGUR	EQUALS	NEGUG +2		NEGATIVE OF R-AXIS GIMBAL DRIVE
A0250					ACCDOTG	ERASE	+2		G-JERK TERM SCALED AT $\pi/2(7)$ RAD/SEC(3)
A0251					(SPWCRD)	EQUALS	ACCDOTG +1		ANY S.P. ERASABLE NUMBER, NEW QACCDOT
A0252					ACCDOTR	EQUALS	ACCDOTG +2		R-JERK TERM SCALED AT $\pi/2(7)$ RAD/SEC(3)
A0253									ACCDOTG,ACCDOTR ARE MAGNITUDES.
A0254					ACSQ	ERASE	+4		G-AXIS ACC.,D.P. AT $\pi/2$ R/SEC(2)
A0255					ADSR	EQUALS	ACSQ +2		R-AXIS ACCELERATION SCALED AT $\pi/2$ R/S2
0256	REF	9	LAST 1466	21,332	GRACXER	EQUALS	ITEMP6		
0257				21,332	CT23146	CTAL	23146		DECIMAL .6
0258	REF	29	LAST 1365	21,332	NZACCDOT	EQUALS	ITEMP3		
0259	REF	173	LAST 1458	21,3321	TIMEGMBL	CAF	ONE		INITIALIZE ALLOWGTS.
0260	REF	3	LAST 1439	21,3322		TS	ALLOWGTS		
0261	REF	106	LAST 1462	21,3323		CAF	TWO		SET UP LCCP FOR R AXIS.
0262	REF	422	LAST 1467	21,3324		LXCF	Q		SAVE RETURN ADDRESS.
0263	REF	25	LAST 1399	21,3325		LXCF	RUPTRG2		

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0264				21,3326	1 3330 0	TCF	+2		
0265	REF	314	LAST 1462	21,3327	3 4755 1	TIMEGMBL	ZFRC		NOW DO THE G-AXIS
0266	REF	1		21,3330	54 066 0	TS	QRNDXER		
0267	REF	2	LAST 1465	21,3331	50 066 1	INDEX	QRNDXER		
0268	REF	5	LAST 1466	21,3332	3 1677 1	CA	ACCDCTQ		ACCDCT IS PRESUMED TO BE AT P1/2(7).
0269				21,3333	0 0006 1	EXTEND			
0270	REF	1		21,3334	6 3404 1	BZMF	TGCFRNCW		IS ACCDCT LESS THAN OR EQUAL TO 0?
0271	REF	1		21,3335	54 063 0	TS	NZACCDCT		NO. STORE NON-ZERO, POSITIVE ACCDCT.
0272	REF	3	LAST 1465	21,3336	50 066 1	ALPHATRY	INDEX	QRNDXER	
0273	REF	24	LAST 1462	21,3337	4 1537 0	CS	AFSQ		
0274				21,3340	0 0006 1	EXTEND			
0275	REF	2	LAST 1465	21,3341	1 3404 0	BZF	TGCFRNCW		IS ALPHA ZERO?
0276	REF	423	LAST 1468	21,3342	54 002 1	TS	Q		SAVE A COPY OF -ACS.
0277				21,3343	0 0006 1	EXTEND			NO. RESCALE FOR TIMEGMBL USE.
0278	REF	1		21,3344	7 2320 1	MP	CCT23146		DECIMAL 23146 IS DECIMAL .6
0279	REF	424	LAST 1469	21,3345	6 0012 0	AC	Q		-1.6*ACS AT P1/2 = -.4*ACS AT P1/8.
0280	REF	302	LAST 1465	21,3346	54 001 1	TS	L		WAS THERE CVERFLOW?
0281	REF	1		21,3347	1 3354 1	TCF	SETNEGL		NO. COMPUTE DRIVE TIME.
0282	REF	526	LAST 1463	21,3350	4 0000 0	CS	A		RECOVER -SGN(ACS) IN THE A REGISTER.
0283	REF	4	LAST 1465	21,3351	50 066 1	INDEX	QRNDXER		YES. START DRIVE WITHOUT WAITLIST.
0284	REF	8	LAST 1466	21,3352	571501 1	XCH	NEGUQ		
0285	REF	1		21,3353	1 3410 0	TCF	NETALLCW		KNOCK DOWN THE ALLOWGTS FLAG.
0286				21,3354	7 0006 1	SETNEGL	EXTEND		
0287	REF	1		21,3355	6 3352 0	PZMF	PCSALPH		
0288				21,3356	4 0000 0	CCM			
0289	REF	27	LAST 1366	21,3357	54 062 1	TS	ITFMP2		STORE -ABS(.4*ACS) SCALED AT P1/8.
0290	REF	66	LAST 1464	21,3360	4 4753 0	CS	BIT1		
0291	REF	2	LAST 1465	21,3361	1 3364 1	TCF	PCSALPH +2		
0292	REF	28	LAST 1465	21,3362	54 062 1	TS	ITFMP2		STORE -ABS(.4*ACS) SCALED AT P1/8.
0293	REF	67	LAST 1465	21,3363	2 4753 1	CA	BIT1		
0294	REF	5	LAST 1465	21,3364	50 066 1	+2	INDEX	QRNDXER	SGN(ACS) INTO NEGU
0295	REF	9	LAST 1469	21,3365	551501 0	TS	NEGUQ		STORE SGN(ALPHA) AS NEGL
0296				21,3366	2 0063 1	CA	NZACCDCT		
0297				21,3367	0 0006 1	EXTEND			
0298	REF	42	LAST 1466	21,3370	7 4740 1	MP	BIT12		2*ACCDCT, SCALED AT P1/8.
0299	REF	29	LAST 1465	21,3371	6 0062 0	AD	ITFMP2		-AES(ALPHA) + 2*ACCDCT, AT P1/8.
0300				21,3372	0 0006 1	EXTEND			
0301	REF	2	LAST 1465	21,3373	6 3410 1	BZMF	NCTALLOW		IS DRIVE TIME MORE THAN TWO SECONDS?
0302	REF	31	LAST 1469	21,3374	4 0062 1	CS	ITFMP2		NO. COMPUTE DRIVE TIME.
0303				21,3375	3 0006 1	EXTEND			ABS(ALPHA) AT P1/8.
0304	REF	1		21,3376	7 2431 0	MP	CCT03240		DECIMAL 03240
0305				21,3377	0 0006 1	EXTEND			QUOTIENT IS DRIVE TIME AT WAITLIST.
0306	REF	3	LAST 1465	21,3400	10 063 0	CV	NZACCDCT		ABS(ALPHA)/ACCDCT AT 2(14)/100

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0307				21,3401	0 0106 1	EXTEND			
0308	REF	2	LAST 1465	21,3402	1 3404 0	PZF	TGCFNCH		DRIVE TIME MUST BE GREATER THAN ZERO.
0309	REF	1		21,3403	1 3416 0	TCF	DRIVECN		
0310	REF	305	LAST 1465	21,3404	3 4755 1	TGCFNCH	CAF	ZERO	TURN OFF GIMBAL NOW.
0311	REF	6	LAST 1465	21,3405	50 066 1		INDEX	QRNDXER	
0312	REF	10	LAST 1465	21,3406	551501 0		TS	NEGUC	
0313	REF	1		21,3407	1 3420 0	TCF	DONEYET		
0314	REF	4	LAST 823	21,3410	3 6010 0	NOTALLOW	CAF	OCT31	
0315	REF	7	LAST 1470	21,3411	50 066 1		INDEX	QRNDXER	
0316	REF	8	LAST 1462	21,3412	551632 0		TS	QGIMTIMF	
0317	REF	306	LAST 1470	21,3413	3 4755 1		CAF	ZERO	DRIVE TIME IS MORE THAN 2 SECONDS, SO
0318	REF	4	LAST 1468	21,3414	551502 0		TS	ALLOWETS	DO NOT PERMIT FURTHER GTS ATTITUDE-STATE
0319									CONTROL UNTIL ADSTASK APPROVES.
0320	REF	2	LAST 1470	21,3415	1 3420 0	TCF	DONEYET		NO WAITLIST CALL IS MADE.
0321	REF	8	LAST 1470	21,3416	50 066 1	DRIVECN	INDEX	QRNDXER	
0322	REF	9	LAST 1470	21,3417	551632 0		TS	QGIMTIMR	CHOOSE G OR R AXIS.
0323	REF	9	LAST 1470	21,3420	10 066 0	DONEYET	CCS	QRNDXER	
0324	REF	1		21,3421	1 3327 0		TCF	TIMQCNBL	
0325	REF	18	LAST 1352	21,3422	52 073 1	EXCH	RLPTRG3		PROTECT IBNKCALL ERASABLES. ACCT+C12
0326	REF	31	LAST 1465	21,3423	52 063 0	EXCH	ITEMF2		LEAVES ITEMS2,3 ALONE.
0327	REF	62	LAST 1442	21,3424	0 4674 0	TC	IBNKCALL		TURN OFF CHANNEL BITS, SET G(R)ACCDTS.
0328	REF	2	LAST 1418	21,3425	35742 0	CAEP	ACCT+C12		
0329	REF	32	LAST 1470	21,3426	52 063 0	EXCH	ITEMF2		RESTORE ERASABLES FOR IBNKCALL.
0330	REF	19	LAST 1470	21,3427	52 073 1	EXCH	RLPTRG3		
0331	REF	26	LAST 1468	21,3430	0 0071 1	TC	FUPTRG2		RETURN TO CALLER.
0332				21,3431	00240 1	OCT00240	OCTAL	00240	DECIMAL 10/1024

L TRIM GIMBAL CONTROL SYSTEM

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R0333 THE FOLLOWING SECTION IS A CONTINUATION OF THE TRIM GIMBAL CONTROL FROM THE LAST GTS ENTRY. THE QUANTITY NEGUSUM
R1335 IS COMPUTED FOR EACH AXIS (Q,R), $.707 * DEL * FUNCTION(3/2) + K2THETA = NEGUSUM$. NEW DRIVES ARE ENTERED TO CH I2.

R0337 THE SGBRETIME GTSRT ACCEPTS A DOUBLE PRECISION VALUE IN FUNCTION, FUNCTION +1 AND RETURNS A SINGLE-PRECISION
R0339 SQUARE ROOT OF THE FOURTEEN MOST SIGNIFICANT BITS OF THE ARGUMENT. ALSO, THE CELL SHFTFLAG CONTAINS A BINARY
R0341 EXPONENT S, SUCH THAT THE SQUARE ROOT (RETURNED IN THE A REGISTER) MUST BE SHIFTED RIGHT (MULTIPLIED BY 2 TO THE
R0342 POWER (-S)) IN ORDER TO BE THE TRUE SQUARE ROOT OF THE FOURTEEN MOST SIGNIFICANT BITS OF FUNCTION, FUNCTION +1.
R1345 SQUARE ROOT ERROR IS NOT MORE THAN 2 IN THE 14TH SIGNIFICANT BIT. CELLS CLOREFRC ARE A,L,SHFTFLAG,INDEX,
R0347 HALFARG,SCRATCH,SR,FUNCTION, FUNCTION +1. GTSRT IS CALLED BY TC GTSRT AND RETURNS VIA TC Q OR TC FUNCTION +1.
R0349 ZERO OR NEGATIVE ARGUMENTS YIELD ZERO FOR SQUARE ROOTS.

R0350	REF	8	LAST 1465	21,3432	11'751 1	GTSRT	CCS	FUNCTION		
R0351	REF	1		21,3433	1 3451 0		TCF	GCCDARG		FUNCTION IS POSITIVE. TAKE SQUARE ROOT.
R0352				21,3434	1 3426 1		TCF	+2		HIGH ORDER WORD IS ZERO. TRY THE LOWER.
R0353	REF	1		21,3435	1 3442 1		TCF	ZERROOT		NEGATIVE. USE ZERO FOR 1/2 POWER.
R0354	PEF	9	LAST 1471	21,3436	2 1752 0		CA	FUNCTION +1		
R0355				21,3437	0 0006 1		EXTEND			
R0356	REF	2	LAST 1471	21,3440	6 3442 0		BZMF	ZERROOT		
R0357	REF	1		21,3441	1 3445 0		TCF	ZERFHIGH		PROCEED.
R0358	PEF	307	LAST 1470	21,3442	3 4755 1	ZERROOT	CA	ZERO		
R0359	REF	1		21,3443	55'741 0		TS	SHFTFLAG		
R0360	REF	425	LAST 1469	21,3444	0 0002 0		TC	Q		
R0361	REF	10	LAST 1471	21,3445	57'751 0	ZEROFICH	XCF	FUNCTION		14 MOST SIGNIFICANT BITS ARE IN THE
R0362	REF	11	LAST 1471	21,3446	57'752 0		XCF	FUNCTION +1		LOWER WORD. EXCHANGE THEM.
R0363	REF	24	LAST 1364	21,3447	3 4757 0		CA	SEVEN		
R0364	REF	2	LAST 1471	21,3450	1 3452 0		TCF	GCCDARG +1		
R0365	REF	308	LAST 1471	21,3451	3 4755 1	GCCDARG	CA	ZERO		
R0366	PEF	2	LAST 1471	21,3452	55'741 0		TS	SHFTFLAG		
R0367	REF	1		21,3453	3 5741 0		CA	TWELVE		INITIALIZE THE SCALING LOOP.
R0368	REF	1		21,3454	55'744 0		TS	INDEX		
R0369	REF	1		21,3455	1 3464 0		TCF	SCALLCOOP		
R0370	REF	12	LAST 1471	21,3456	3 1751 0	SCALSTRT	CA	FUNCTION		
R0371	REF	1		21,3457	1 3500 0		TCF	SCALDCNE		
R0372	PEF	11	LAST 1456	21,3460	3 7751 0	MULBUSH	CA	NEG2		IF ARG IS NOT LESS THAN 1/4, INDEX IS
R0373	PEF	2	LAST 1471	21,3461	27'744 0		ADS	INDEX		ZERO, INDICATING NO SHIFT NEEDED.
R0374				21,3462	0 0006 1		EXTEND			BRANCH IF ARG IS NOT LESS THAN 1/4.
R0375	REF	1		21,3463	6 3456 0		BZMF	SCALSTRT		OTHERWISE COMPARE ARG WITH A REFERENCE
A0376										WHICH IS 4 TIMES LARGER THAN THE LAST.
R0377	REF	13	LAST 1471	21,3464	4 1751 1	SCALLCOOP	CS	FUNCTION		
R0378	REF	3	LAST 1471	21,3465	51'744 1		INDEX	INDEX		
R0379	REF	53	LAST 1446	21,3466	6 4735 1		AD	BIT15		REFERENCE MAGNITUDE LESS OR EQUAL TO 1/4
R0380				21,3467	0 0006 1		EXTEND			
R0381	PEF	1		21,3470	6 2460 0		BZMF	MULBUSH		IF ARE IS NOT LESS THAN REFERENCE, GO
A0382										AROUND THE MULBERRY BUSH ONCE MORE.

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0383	RFF	4	LAST 1471	21,3471	51,744 1	INDEX	ININDEX
0384	RFF	54	LAST 1471	21,3472	3 4735 1	CA	BIT15
0385	RFF	1		21,3473	57,747 1	XCH	HALFARG
0386				21,3474	0 0006 1	EXTEND	
0387	RFF	14	LAST 1471	21,3475	3 1752 0	CCA	FUNCTION
0388				21,3476	0 0006 1	EXTEND	
0389	RFF	2	LAST 1472	21,3477	11,747 0	DV	HALFARG

THIS IS THE SCALE MAGNITUDE
2*(-ININDEX) IS THE SHIFT DIVISOR.
RFSCALE ARGUMENT.

ININDEX AND SHFTFLAG PRESEVE INFO FOR

RESCALING AFTER ROOT PROCESS.

SAVE G FOR RETURN

A0390							
A0391							
0392				21,3500	0 0006 1	SCALCONE	EXTEND
0393	RFF	15	LAST 1472	21,3501	23,752 0	CXCH	FUNCTION +1
0394				21,3502	0 0006 1	EXTEND	
0395	RFF	86	LAST 1463	21,3503	7 4736 0	MP	BIT14
0396	RFF	3	LAST 1472	21,3504	55,747,0	TS	HALFARG
0397	RFF	59	LAST 1452	21,3505	7 4737 1	MASK	BIT13
0398	RFF	527	LAST 1469	21,3506	10 000 0	CCS	A
0399	RFF	1		21,3507	3 3625 0	CA	OCT11276
0400	RFF	1		21,3510	6 3623 0	AD	ROOTHALF

INITIAL GUESS IS RCCT 1/2 OR PCSMAX

0401	RFF	1		21,3511	0 3627 1	TC	RCCTCYCL
0402	RFF	2	LAST 1472	21,3512	0 3627 1	TC	RCCTCYCL
0403	RFF	3	LAST 1472	21,3513	0 3627 1	TC	RCCTCYCL
0404	RFF	16	LAST 1472	21,3514	0 1752 0	TC	FUNCTION +1

R0415 *****

0407	RFF	1		21,3515	0 3432 1	RSTCFCTS	TC	GTSQRT
0408	RFF	13	LAST 1466	21,3516	57,742 1	PRODCT	XCH	K2CENTRAL
0409				21,3517	0 0006 1	EXTEND		
0410	RFF	14	LAST 1472	21,3520	7 1742 0	MP	K2CENTRAL	
0411	RFF	15	LAST 1472	21,3521	53,743 1	CXCH	K2CENTRAL	
0412				21,3522	0 0006 1	EXTEND		
0413	RFF	303	LAST 1469	21,3523	7 0001 1	MP	L	
0414	RFF	16	LAST 1472	21,3524	27,743 1	ADS	K2CENTRAL +1	
0415	RFF	304	LAST 1472	21,3525	54 0001 1	TS	L	
0416				21,3526	1 3530 0	TCF	+2	
0417	RFF	17	LAST 1472	21,3527	27,742 0	ADS	K2CENTRAL	

THE PRODUCT OF

$$\frac{1}{2} * (\text{DEL} * \text{CMEGA} + \text{ALPHA} / (2 * K))$$

AND

$$\frac{1}{2} * (\text{DEL} * \text{CMEGA} + \text{ALPHA} / (2 * K)) \text{ NOW IN } K2CENTRAL$$

A0418								
0419	RFF	5	LAST 1472	21,3530	2 1744 1	DOSHIFT	CA	ININDEX
0420				21,3531	0 0006 1	EXTEND		
0421	RFF	87	LAST 1472	21,3532	7 4736 0	MP	BIT14	
0422	RFF	3	LAST 1471	21,3533	27,741 0	ADS	SHFTFLAG	
0423				21,3534	0 0006 1	EXTEND		
0424	RFF	1		21,3535	1 3554 1	BZF	ADDITIN	
0425	RFF	4	LAST 1472	21,3536	51,741 1	INDEX	SHFTFLAG	
0426	RFF	55	LAST 1472	21,3537	3 4735 1	CA	BIT15	

MULTIPLY IN THE FACTOR 2(-S), RETURNED
BY THE GTSQRT SUBROUTINE

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0427	REF	18	LAST 1472	21,3540	57'742 1	XCF	K2CENTRAL	
0428				21,3541	0 0006 1	EXTEND		
0429	REF	19	LAST 1473	21,3542	7 1742 0	MP	K2CENTRAL	
0430	REF	7	LAST 1465	21,3543	21'740 1	CAS	K2THETA	
0431	REF	20	LAST 1473	21,3544	57'742 1	XCH	K2CENTRAL	
0432				21,3545	0 0006 1	EXTEND		
0433	REF	21	LAST 1473	21,3546	7 1743 1	MP	K2CENTRAL +1	
0434	REF	8	LAST 1473	21,3547	27'740 1	ADS	K2THETA +1	
0435	REF	305	LAST 1472	21,3550	54 001 1	TS	L	
0436				21,3551	1 3553 0	TCF	+2	
0437	REF	9	LAST 1473	21,3552	27'737 1	ADS	K2THETA	
0438	REF	3	LAST 1466	21,3553	1 3557 1	TCF	NEGUSUM	
0439				21,3554	0 0006 1	EXTEND		
0440	REF	22	LAST 1473	21,3555	3 1743 0	PCA	K2CENTRAL	
0441	REF	10	LAST 1473	21,3556	21'740 1	CAS	K2THETA	NOW ADD IN THE K2THETA TERM.
0442	REF	11	LAST 1473	21,3557	11'737 1	CCS	K2THETA	TEST SIGN OF HIGH ORDER PART.
0443	REF	1		21,3560	1 3564 1	TCF	NEGDRIVE	
0444				21,3561	1 3563 0	TCF	+2	
0445	REF	2	LAST 1463	21,3562	1 3566 0	TCF	POSITIVE	
0446	REF	12	LAST 1473	21,3563	11'740 1	CCS	K2THETA +1	SIGN TEST FOR LOW ORDER PART.
0447	REF	68	LAST 1465	21,3564	3 4753 1	CA	B1T1	
0448				21,3565	1 3567 1	TCF	+2	STOP GIMBAL DRIVE FOR A ZEPG NEGUSUM.
0449	REF	69	LAST 1473	21,3566	4 4753 0	CS	B1T1	
0450	REF	306	LAST 1473	21,3567	54 001 1	TS	L	SAVE FOR DRIVE REVERSAL TEST.
0451	REF	6	LAST 1463	21,3570	51'750 1	INDEX	QRCNTR	
0452	REF	11	LAST 1470	21,3571	57'501 1	XCF	NEGUC	
0453				21,3572	0 0006 1	EXTEND		
0454	REF	307	LAST 1473	21,3573	7 0001 1	MP	L	MULTIPLY OLD NEGU AND NEW NEGL.
0455	REF	308	LAST 1473	21,3574	10 001 1	CCS	L	
0456	REF	1		21,3575	1 3612 0	TCF	LCUPE	NON-ZERO GIMBAL DRIVE BEING CONTINUED.
0457	REF	1		21,3576	1 3607 1	TCF	ZEROLCUP	NO REVERSAL PROBLEM HERE.
0458	REF	1		21,3577	1 3601 1	TCF	REVERSAL	NON-ZERO GIMBAL DRIVE BEING REVERSED.
0459	REF	2	LAST 1473	21,3600	1 3607 1	TCF	ZEROLCUP	NO REVERSAL PROBLEM HERE.
0460	REF	7	LAST 1473	21,3601	51'750 1	REVERSAL INDEX	QRCNTR	A ZERO-DRIVE FAUSE IS NEEDED HERE. ZERO
0461	REF	5	LAST 1466	21,3602	55'510 0	TS	QACCDCT	IS IN A REGISTER FROM CCS ON (-1).
0462	REF	8	LAST 1473	21,3603	51'750 1	INDEX	QRCNTR	
0463	REF	1		21,3604	4 3624 0	CS	GMBLBITA	
0464				21,3605	0 0006 1	EXTEND		
0465	REF	73	LAST 1466	21,3606	03 012 1	WAND	CHAN12	
0466	REF	54	LAST 1467	21,3607	4 1262 1	ZEROLCUP CS	RCSFLAGS	SET UP REQUEST FOR ACCT+012 CALL.
0467	REF	3	LAST 1467	21,3609	7 4747 0	MASK	CALLGMBL	
0468	REF	55	LAST 1473	21,3611	27'262 1	ADS	RCSFLAGS	

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0465	REF	5	LAST 1473	21,3612	11'750 0	LCUPE	CCS	QRCNTR	HAVE BOTH AXES BEEN PROCESSED?
0470	REF	2	LAST 1462	21,3613	1 2106 1		TCF	GCCTPING	NO. CC G AXIS NEXT.
0471	REF	2	LAST 1462	21,3614	3 1505 0		CA	SAVESR	RESTORE THE SP
0472	REF	28	LAST 1462	21,3615	54 021 0		TS	SR	
0473				21,3616	0 0006 1	GCCLCSE	EXTEND		TERMINATE THE JASK.
0474	REF	1		21,3617	3 3622 1		CCA	CLOSEADR	
0475				21,3620	52 006 0		ETCB		
0476	REF	25	LAST 1469	21,1537			EBANK=	ACSQ	
0477	REF	4	LAST 1445	21,3621	0327 1	CLOSEADR	2CADR	CLOSECUT	TERMINATE THE JASK.
0477				21,3622	36106 0				
R0478									
0479	REF	6	LAST 1421	5741		TWELVE	EQUALS	0CT14	
0480				21,3623	26501 1	ROOTHALF	0CTAL	26501	SQARE PCCT OF 1/2
0481				21,3624	01400 1	GMBLEITA	0CTAL	01400	INDEXED WRT GMBLEITA CC ACT MOVE*****
0482				21,3625	11276 1	0CT11276	0CTAL	11276	PCSMAX - ROOTHALF
0483				21,3626	06000 1	GMBLEITA	0CTAL	06000	INDEXED WRT GMBLEITA CC ACT MOVE*****
R0484									
R0485									
R0486									
R0488									
R0490									
R0492									
R0493									
0495	REF	1		21,3627	55'746 1	ROOTCYCL	TS	SCRATCH	STORE X
0496	REF	29	LAST 1474	21,3630	54 021 0		TS	SR	X/2 NEW IN SR
0497	REF	4	LAST 1472	21,3631	3 1747 1		CA	HALFARG	ARC/2 IN THE A REG
0498				21,3632	22 007 1		ZL		PREPARE FOR DIVISION
0499				21,3633	0 0006 1		EXTEND		
0500	REF	2	LAST 1474	21,3634	11'746 1		CV	SCRATCH	(APG/X)/2
0501	REF	30	LAST 1474	21,3635	6 0021 1		AD	SR	(X + ARC/X)/2 IN THE A REG
0502	REF	426	LAST 1471	21,3636	0 0002 0		TC	Q	

RC503

L ADSTASK AND ADSJOP

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R0001 PROGRAM NAME: 1/ACCS
R0002 PROGRAM WRITTEN BY: BOB CIOVELLI AND MIKE HOUSTON
R0003 LAST MODIFICATION: FEB.14,1969 BY G.KALAN

R0004 PROGRAM DESCRIPTION:

R0005 1/ACCS PROVIDES THE INTERFACE BETWEEN THE GUIDANCE PROGRAMS AND THE DIGITAL PILOT. WHENEVER THERE IS A
R0007 CHANGE IN THE MASS OF THE VEHICLE, IN THE DEADBAND SELECTED, IN THE VEHICLE CONFIGURATION (ASCENT-DESCENT-
R0009 DOCKED), AND DURING A FRESH START OR A RESTART, 1/ACCS IS CALLED TO COMMUNICATE THE DATA CHANGES TO THE DAF.

R0011 THE INPUTS TO 1/ACCS ARE MASS, ACCELERATION (ABDELV), DEADBAND (DB), OFFSET ACCELERATIONS (ACSG AND AGSR),
R0013 STAGE VERIFY BIT (CHAN3,BIT2), DOCKED BIT (DAPBODLS,BIT13), DRIFT BIT (DAPBODLS,BIT1), USEGRJTS (DAPBODLS,
R0015 BIT14), AND SURFACE FLAG (FLAGWDR,BIT8), AND CH5MASK.

R0016 1/ACCS COMPUTES THE JET ACCELERATIONS (1JACC, 1JACCQ, 1JACCP) AS FRACTIONS OF MASS. 1JACCU AND 1JACCV ARE
R0018 FORMED BY RESOLVING 1JACCQ AND 1JACCP. IN THE DESCENT CASE, THE DESCENT ENGINE MOMENT ARM (L,PLT-CC) IS ALSO
R0020 COMPUTED AS A FUNCTION OF MASS. THE RATE OF CHANGE OF ACCELERATION DUE TO ROTATION OF THE GIMBAL (ACCDCTQ,
R0022 ACCDCTR) IS ALSO COMPUTED IN THE DESCENT CASE.

R0023 AFTER THE ABOVE COMPUTATIONS, THE PROGRAM 1/ACCONT COMPUTES THE RECIPROCAL NET ACCELERATIONS ABOUT THE P, L,
R0025 AND V AXES (2 JETS FOR P AXIS, BOTH 1 AND 2 JETS FOR L AND V AXES), AND THE RECIPROCAL COAST ACCELERATIONS ABOUT
R0027 THE P, L, AND V AXES. THE ACCELERATION FUNCTIONS (ACCFCTZ1 AND ACCFCTZ5) ARE ALSO COMPLETED FOR THESE AXES. THE
R0029 FIRE AND COAST DEADBANDS AND AXISDIST ARE COMPLETED FOR EACH AXIS. FLAT AND ZONEBLTY, THE WIDTH AND HEIGHT OF THE
R0031 MINIMUM IMPULSE ZONE, ARE COMPUTED. 1/ACCONT ALSO SETS ACCSWU AND ACCSWV, WHICH INDICATE WHEN 1 JET ACCELERATION
R0033 IS NOT SUFFICIENT TO PRODUCE MINIMUM ACCELERATION. AT THE COMPLETION OF 1/ACCS, THE ACCSKAY BIT IS SET.

R0035 SUBROUTINES CALLED:

R0036 TIMEFMRL
R0037 MAKECADR
R0038 ROT45DEG

R0039 CALLING SEQUENCE:

A0040 TC BANKCALL (1/ACCS MUST BE CALL BY BANKCALL
A0041 CADR 1/ACCS

R0042 NORMAL EXIT: VIA BANKJUMP ALARM AND APOBT EXIT MODES: NONE.

R0043 INPUT/OUTPUT: SEE PROGRAM DESCRIPTION

R0044 DEPRIS:

R0045 ALL OF THE EXECUTIVE TEMPORARY REGISTERS, EXCEPT FIXLCC AND OVFLND, AND THE CORE SET AREA FROM MPAC TO BANKSET.

R0047 RESTRICTIONS:

R0048 1/ACCS MUST BE CALLED BY BANKCALL
R0049 BRANK IS SET TO 6, PLT NOT RESTORED.

L AOSTASK AND AOSJOB

USER'S PAGE NO. 2 EQ 54

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0050          21,2637          BANK 21
0051 PFF 2 LAST 1467 21,2637 SETLCC DAFS4
0052          21,2637          BANK

0053 RFF 1          COUNT* 44/DAPAC

0054 RFF 26 LAST 1474 56,1537 EBANK= ACSC

R0055 ENTRY IS THROUGH 1/ACCJOB OR 1/ACCSET WHEN 1/ACCS IS TO BE DONE AS A SEPARATE ACVAC JOB.

R0057 IT IS POSSIBLE FOR MORE THAN ONE OF THESE JOBS TO BE SET UP CONCURRENTLY. HOWEVER, SINCE THERE IS NO CHECK OF
R0059 NEWJOB, A SECOND MANIFESTATION CANNOT BE STARTED UNTIL THE FIRST IS COMPLETED.

0061 RFF 205 LAST 1471 21,2637 3 4755 1 1/ACCSET CAF ZFRQ ENTRY FROM FRESH START/RESTART CCCING.
0062 RFF 27 LAST 1476 21,2640 55*537 0 TS ACSC NULL THE OFFSET ESTIMATES FOR 1/ACCS.
0063 RFF 17 LAST 1417 21,2641 55*541 1 TS ACSR
0064 RFF 6 LAST 1417 21,2642 55*424 0 TS ALPHAC NULL THE OFFSET ESTIMATES FOR DCWALLIST
0065 RFF 5 LAST 1417 21,2643 55*425 1 TS ALPHAP

0066 RFF 314 LAST 1392 21,2644 4 4616 1 1/ACCJOB TC BANKCALL 1/ACCS ASSUMES ENTRY VIA BANKCALL.
0067 RFF 2 LAST 858 21,2645 4*465 1 CADR 1/ACCS +2 SKIP EBANK SETTING.

0068 RFF 158 LAST 1382 21,2646 0 5155 0 TC ENDJOB

00682          20,2463          BANK 20
00683 RFF 5 LAST 1404 20,2463 SETLCC DAFS3
00684          20,2463          BANK
00685 PFF 3 LAST 43 TO 44: 3 4* COUNT* 44/DAPAC

0069 RFF 10 LAST 1398 20,2462 3 5*15 0 1/ACCS CA EBANK6 ***** FEANK SET BUT NOT RESTORE *****
0070 RFF 88 LAST 1399 20,2464 54 003 0 TS FBANK

0071 RFF 16 LAST 1367 20,2465 0 4645 1 TC MAKECADR SAVE RETURN SC THAT BUF2 MAY BE USED
0072 RFF 1 LAST 20,2466 54 117 1 TS ACCEPTPN

R0073 DETERMINE MASS OF THE LEM.
0074 PFF 59 LAST 1443 20,2467 3 0111 0 CA DAPBCCLS IS CSM COCKED
0075 RFF 11 LAST 1442 20,2470 7 4737 1 MASK CSMDOCKO
0076 PFF 1 20,2471 54 157 0 TS DECKTEMP STORE RECORD OF STATE IN TEMP (MPAC +2).
0077 RFF 528 LAST 1472 20,2472 10 011 0 CCS A
0078 RFF 5 LAST 315 20,2473 4 1327 1 CS CSMMASS COCKED: LEMMASS = MASS - CSMMASS
0079 RFF 14 LAST 855 20,2474 6 1243 0 AD MASS LEM ALONE: LEMMASS = MASS
0080 PFF 11 LAST 315 20,2475 55*326 0 TS LEMMASS

R0081 ON THE BASIS OF APSFLAG:
R0082 SET THE P-AXIS RATE COMMAND LIMIT FOR 2-JET/4-JET CONTROL
R0083 SET MPAC, WHICH INDICATES THE PROPER SET OF COEFFICIENTS FOR THE LEM-ALONE F(MASS) CALCULATIONS
R0085 ENSURE THAT THE LEM MASS VALUE IS WITHIN THE ACCEPTABLE RANGE

00855          20,2476 0 004 0          INHINT

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L AGCTASK AND ADSJCR

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0086	REF	24	LAST	1443	20,2477	30 106 0	CAE	FLGWRD10	CCTEPMINE WHETHER STAGEC.	
0087	REF	16	LAST	1443	20,2500	7 4737 1	MASK	APSFBLIT		
0088					20,2501	0 0006 1	EXTEND			
0089	REF	1			20,2502	1 2526 0	BZF	DFSFLITE		
0090	REF	40	LAST	1464	20,2503	4 4733 0	CS	P7SMAX	ASCENT (OR ON LUNAR SURFACE)	
0091	REF	3	LAST	1426	20,2514	55 475 1	TS	-2JETLIN	ALWAYS 2 JETS FOR P-AXIS RATE COMMAND	
0092	REF	7	LAST	1474	20,2515	3 5741 0	CAF	DCT14	INITIALIZE INDEX AT 12.	
0093	REF	882	LAST	1392	20,2506	54 154 0	TS	MPAC		
0094	REF	12	LAST	1476	20,2517	4 1326 0	CS	LEMMASS	CHECK IF MASS TOO HIGH. CATCH STAGING.	
0095	REF	3	LAST	213	20,2510	6 1400 1	AD	HIA SCENT		
0096					20,2511	0 0006 1	EXTEND			
0097	REF	1			20,2512	6 2517 0	BZMF	MASSFIX		
0098	REF	13	LAST	1477	20,2513	4 1326 0	CS	LEMMASS	CHECK IF MASS TOO LOW. THIS LIMITS THE	
0099	REF	1			20,2514	6 2001 1	AD	LCASCENT	DECREMENTING BY MASSMON.	
0100					20,2515	7 2006 1	EXTEND			
0101	REF	1			20,2516	6 2544 0	BZMF	F(MASS)		
0102	REF	14	LAST	1477	20,2517	27 326 0	MASSFIX	ADS	LEMMASS	STORE THE VIOLATED LIMIT AS LEMMASS.
0103					20,2520	22 007 0	ZL			ALSO CORRECT TOTAL MASS, ZEROING THE
0104	REF	2	LAST	1476	20,2521	10 157 0	CCS	DOCKTEMP		LOW-CORR WPDC.
0105	REF	6	LAST	1476	20,2522	31 327 0	CAE	CSMASS		DOCKED: MASS = LEMMASS + CSMASS
0106	REF	16	LAST	1477	20,2523	6 1326 1	AD	LEMMASS		LEM ALCAE: MASS = LEMMASS
0107	REF	15	LAST	1476	20,2524	53 244 0	EXCH	MASS		
0108	REF	2	LAST	1477	20,2525	1 2544 1	TCF	F(MASS)		
0109	REF	53	LAST	1466	20,2526	4 4742 0	DFSFLITE	CS	RIT10	FOUR JETS FOR P-AXIS RATE COMMAND ERRORS
0110	REF	4	LAST	1477	20,2527	55 475 1	TS	-2JETLIN		EXCEEDING 1.4 DEG/SEC (SCALED AT 45)
0111	REF	34	LAST	1430	20,2530	3 6245 1	CAF	SIX		INITIALIZE INDEX AT 6.
0112	REF	883	LAST	1477	20,2531	54 154 0	TS	MPAC		
0113	REF	16	LAST	1477	20,2532	4 1326 0	CS	LEMMASS	CHECK IF MASS TOO HIGH. SHOULD NEVER	
0114	REF	1			20,2533	6 2002 1	AD	HIDESCENT		OCCUR EXCEPT PERHAPS BEFORE THE PAC
0115					20,2534	0 0006 1	EXTEND			LOAD IS DONE.
0116	REF	2	LAST	1477	20,2535	6 2517 0	BZMF	MASSFIX		
0117	REF	17	LAST	1477	20,2536	4 1326 0	CS	LEMMASS	CHECK IF MASS TOO LOW. THIS LIMITS THE	
0118	REF	1			20,2537	6 2003 0	AD	LCDESCENT		DECREMENTING BY MASSMON.
0119	REF	4	LAST	1477	20,2540	6 1400 1	AD	HIA SCENT		
0120					20,2541	0 0006 1	EXTEND			
0121	REF	3	LAST	1477	20,2542	6 2544 0	BZMF	F(MASS)		
0122	REF	3	LAST	1477	20,2543	1 2517 1	TCF	MASSFIX		
0123	COMPUTATION OF FUNCTIONS OF MASS									
0124					20,2544	4 0003 1	F(MASS)	REFLINT		
0125	REF	3	LAST	1477	20,2545	10 157 0	CCS	DOCKTEMP		
0126	REF	1			20,2546	1 3111 1	TCF	DOCKED		DOCKED: USE SEPARATE COMPUTATION.
0127	REF	107	LAST	1466	20,2547	3 4752 0	CA	TWO		
0128	REF	884	LAST	1477	20,2550	54 155 1	STCTR	TS	MPAC +1	J=2,1,0 FOR 1JACCR,1JACCG,1JACC
0129	REF	108	LAST	1477	20,2551	4 4752 1	CS	TWO		
0130	REF	885	LAST	1477	20,2552	26 154 0	ADS	MPAC		JX=10,8,6 OR 4,2,0 TO INDEX COEFS.

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0131	REF	18	LAST 1477	20,2553	31,326 1	STCTR1	CAE	LEMMASS	
01311	REF	886	LAST 1477	20,2554	50 154 1		INDEX	MPAC	
0132	REF	1		20,2555	6 3064 0		AD	INERCONA	
0133	REF	887	LAST 1478	20,2556	54 156 1		TS	MPAC +2	MASS + C
0134				20,2557	0 0006 1		EXTEND		
0135	REF	888	LAST 1478	20,2560	5 0154 1		INDEX	MPAC	
0136	REF	1		20,2561	3 3146 0		CCA	INERCONA	
0137				20,2562	0 0006 1		EXTEND		
0138	REF	889	LAST 1478	20,2563	10 156 1		DV	MPAC +2	
0139	REF	890	LAST 1478	20,2564	50 154 1		INDEX	MPAC	
0140	REF	1		20,2565	6 3064 0		AD	INERCONA	
0141	REF	891	LAST 1478	20,2566	50 155 0		INDEX	MPAC +1	1JACC(J)=A(JX)/(MASS+C(JX) + E(JX)
0142	REF	8	LAST 1413	20,2567	55,530 1		TS	1JACC	1JACC(-1)=L,PVT-CG SCALED AT 8 FEET
0143	REF	892	LAST 1478	20,2570	10 155 1		CCS	MPAC +1	
0144	REF	1		20,2571	1 2550 1		TCF	STCTR	
0145	REF	1		20,2572	1 2574 1		TCF	CCMMEGS	
0146	REF	1		20,2573	1 2673 0		TCF	LRSC	

R0147 COEFFQ AND COEFFP ARE COMPUTED IN THIS SECTION. THEY ARE USED TO RESOLVE Q-R COMPONENTS INTO NON-CRTHCGNIAL
 R0149 U AND V COMPONENTS (SEE ROT-TCV SECTION).

0150	REF	2	LAST 1461	20,2574	4 1532 0	CCMMEGS	CS	1JACCR	
0151	REF	2	LAST 1461	20,2575	6 1531 1		AD	1JACCG	
0152				20,2576	0 0006 1		EXTEND		
0153	REF	1		20,2577	6 2623 1		PZMF	BIGIQ	
0154				20,2600	0 0006 1		EXTEND		
0155	REF	3	LAST 1478	20,2601	11,531 0		DV	1JACCG	EPSILON IS A MEASURE OF COUPLING AND IS DEFINED=1-IQ/IR FOR IR GREATER THAN IQ.
0156	REF	1		20,2602	54 155 1		TS	EPSILON	THE COMPUTED EXPRESSION IS EQUIVALENT
0157	REF	1		20,2603	6 3110 1		AD	-EPSMAX	
0158				20,2604	0 0006 1		EXTEND		
0159	REF	1		20,2605	6 2610 1		PZMF	CCDEPS1	
0160	REF	2	LAST 1478	20,2606	4 3110 0		CS	-EPSMAX	
0161	REF	2	LAST 1478	20,2607	54 155 1		TS	EPSILON	EPSILON IS LIMITED TO A MAX. OF .42265
0162	REF	2	LAST 1478	20,2610	3 0155 0	CCDEPS1	CA	EPSILON	
0163				20,2611	0 0006 1		EXTEND		
0164	REF	1		20,2612	7 3104 0		MP	0.35356	
0165	REF	1		20,2613	6 3106 0		AD	.7071	
0166	REF	2	LAST 1447	20,2614	55,630 1		TS	COEFFP	IN THIS CASE WHERE IR IS GREATER THAN IQ, COEFFQ=-.707(1+.5EPSILON)(1-EPSILON)
0167	REF	41	LAST 1477	20,2615	4 4733 0		CS	PCSMAX	AND COEFFP=.707(1+.5EPSILON)
0168	REF	4	LAST 1478	20,2616	6 0155 0		AD	EPSILON	
0169				20,2617	0 0006 1		EXTEND		
0170	REF	2	LAST 1478	20,2620	7 1630 1		MF	COEFFP	
0171	REF	3	LAST 1447	20,2621	55,627 1		TS	COEFFQ	
0172	REF	1		20,2622	1 2646 0		TCF	JACCUV	
0173				20,2623	0 0006 1	BIGIQ	EXTEND		EPSILON IS DEFINED AS 1-IR/IQ FOR IR GREATER THAN IR. -EPSILON IS COMPUTED RATHER THAN EPSILON FOR CONVENIENCE
0174	REF	3	LAST 1478	20,2624	11,532 0		DV	1JACCR	
0175	REF	1		20,2625	54 155 1		TS	-EPSILON	
0176	REF	2	LAST 1478	20,2626	40,155 1		CS	-EPSILON	
0177	REF	3	LAST 1478	20,2627	6 3110 1		AD	-EPSMAX	

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C178				20,2630	1 0006 1	EXTEND		
C179	REF	1		20,2631	6 2634 1	BZMF	GOODEPS2	
0180	REF	4	LAST 1478	20,2632	3 3110 1	CA	-ERSMAX	
0181	REF	3	LAST 1478	20,2633	54 155 1	TS	-EPSILON	EPSILON IS LIMITED TO A MAX. OF .42265
C182	REF	4	LAST 1479	20,2634	3 0155 0	GOODEPS2	CA	-EPSILON
0183				20,2635	0 0006 1	EXTEND		
0184	REF	2	LAST 1478	20,2636	7 3104 0	MR	0.35256	
0185	REF	1		20,2637	6 3107 1	AD	-0.7071	
0186	REF	4	LAST 1478	20,2640	55 1627 1	TS	COEFFQ	IN THIS CASE WHERE IQ IS GREATER THAN
0187	REF	5	LAST 1479	20,2641	4 0155 1	CS	-EPSILON	IR, COEFFQ=-.707(1+.5EPSILON) AND
0188	REF	12	LAST 1455	20,2642	6 4735 1	AC	NEGMAX	COEFFP=.707(1+.5EPSILON)(1-EPSILON)
0189				20,2643	0 0116 1	EXTEND		
C190	REF	5	LAST 1479	20,2644	7 1627 1	MP	COEFFQ	
0191	REF	4	LAST 1478	20,2645	55 1630 1	TS	COEFFP	
0192	REF	6	LAST 1479	20,2646	4 1627 1	CS	COEFFQ	
0193				20,2647	0 0006 1	EXTEND		
0194	REF	4	LAST 1478	20,2650	7 1531 0	MP	1JACCG	1JACCG IS SCALED AT PI/4
0195	REF	1		20,2651	55 1533 1	TS	1JACCL	1JACCL USED AS TEMPORARY STORAGE
0196	REF	5	LAST 1479	20,2652	3 1630 0	CA	COEFFP	
0197				20,2653	0 0006 1	EXTEND		
0198	REF	4	LAST 1478	20,2654	7 1532 0	MP	1JACGR	
0199	REF	2	LAST 1479	20,2655	6 1533 0	AD	1JACCL	
0200				20,2656	0 0006 1	EXTEND		
0201	REF	88	LAST 1472	20,2657	7 4736 0	MP	BIT14	SCALING CHANGED FROM PI/4 TO PI/2
0202	REF	3	LAST 1479	20,2660	55 1533 1	TS	1JACCL	
0203	REF	1		20,2661	55 1534 0	TS	1JACCV	SCALED AT PI/2 RADIANS/SEC(2)
0204	REF	853	LAST 1478	20,2662	10 154 0	CCS	MFAC	COMPUTE L,PVT-CG IF IN DESCENT
0205	REF	310	LAST 1476	20,2663	3 4755 1	CAF	ZERO	ZERO SWITCHES AND GO TO 1/ACCCNT IN
0206	REF	5	LAST 1476	20,2664	55 1562 0	TS	ALLOWGTS	ASCENT
0207	REF	1		20,2665	1 3234 0	TCF	1/ACCCNT -1	
0208	REF	109	LAST 1477	20,2666	4 4752 1	CS	TWO	
0209	REF	854	LAST 1479	20,2667	54 154 0	TS	MFAC	
0210	REF	174	LAST 1468	20,2670	4 4753 0	CS	ONE	
0211	REF	855	LAST 1479	20,2671	54 155 1	TS	MRAC +1	
0212	REF	1		20,2672	1 2553 1	TCF	STCTR1	
0213	THIS SECTION COMPUTES THE RATE OF CHANGE OF ACCELERATION DUE TO THE ROTATION OF THE GIMBALS. THE EQUATION IMPL							
0215	MENTED IN BOTH THE Y-X PLANE AND THE Z-X PLANE IS -- D(ALPHA)/DT = TL/I*(DELTA)/DT, WHERE							
0217	T = ENGINE THRUST FORCE							
0218	L = PIVOT TO CG DISTANCE OF ENGINE							
0219	I = MOMENT OF INERTIA							
0220	REF	6	LAST 856	20,2673	31 245 0	LRSC	ABDFLV	SCALED AT 2(12) CM/SEC(2)
0221				20,2674	0 0006 1	EXTEND		
0222	REF	16	LAST 1477	20,2675	7 1243 1	MP	MASS	SCALED AT 8+16 KGS
0223	REF	1		20,2676	0 2002 0	TC	DVCSLB	GET COEFFICIENT WITH OVERFLOW PROTECTION
0224	REF	1		20,2677	03105 0	ACRES	GFACTM	

0225 MASS IS DIVIDED BY ACCELERATION OF GRAVITY IN ORDER TO MATCH THE UNITS OF IXX,IYY,IZZ, WHICH ARE SLUG-FT(2).
 0227 THE RATIO OF ACCELERATION FROM PIPAS TO ACCELERATION OF GRAVITY IS THE SAME IN METRIC OR ENGINEERING UNITS, SO

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R0229 THAT IS UNCONVERTED. 2.21462 CONVERTS KG. TO LB. NEW T IS IN A SCALED AT 2(14).

0231			20,2700	0 0006 1		EXTEND		
0232	REF	1	20,2701	7 1527 1		MP	L,PVT-CC	SCALED AT 8 FEET.
0233			20,2702	0 0004 0		INFINI		
0234	REF	896	LAST 1479	54 154 0		TS	MPAC	
0235			20,2704	0 0006 1		EXTEND		
0236	REF	5	LAST 1479	7 1532 0		MP	1JACCR	
0237	REF	2	LAST 1479	0 3002 0		TC	DVCVSUR	GET QUOTIENT WITH OVERFLOW PROTECTION
0238	REF	1		02000 0		ADRES	TCRKJET1	
0239	REF	2	LAST 1466	55 1511 1		TS	ACCDCTR	SCALED AT PI/2(7)
0240	REF	897	LAST 1480	3 0154 1		CA	MPAC	
0241			20,2712	0 0006 1		EXTEND		
0242	REF	5	LAST 1479	7 1531 0		MP	1JACCO	
0243	REF	3	LAST 1480	0 3002 0		TC	DVCVSUB	GET QUOTIENT WITH OVERFLOW PROTECTION
0244	REF	2	LAST 1480	02100 0		ADRES	TCRKJET1	
0245	REF	6	LAST 1469	55 1507 0	SFSCENT	TS	ACCDCTR	SCALED AT PI/2(7)
0246			20,2717	0 0006 1		EXTEND		
0247	REF	1		7 3103 1		MP	DGRF	.3ACCDCTR SCALED AT PI/2(8)
0248	REF	4	LAST 1463	55 1504 0		TS	KC	
0249	REF	3	LAST 1480	21 1511 0		CAF	ACCDCTR	.3ACCDCTR AT PI/2(8)
0250			20,2723	0 0006 1		EXTEND		
0251	REF	2	LAST 1480	7 3103 1		MP	DGRF	
0252	REF	1		55 1506 1		TS	KRDAP	
0253			20,2726	0 0006 1		EXTEND		NOW COMPLETE ACCDCTR, RACCDCTR, THE SIGNED
0254	REF	74	LAST 1473	00 0112 1		READ	CHAN12	JERR TERMS. STORE CHANNEL 12. WITH GIM
0255	REF	898	LAST 1480	54 155 1		TS	MPAC +1	BAL DRIVE BITS 5 THROUGH 12. SET LCCP
0256	REF	54	LAST 1462	3 4752 0		CAF	PIT2	INDEX TO COMPUTE RACCDCTR, THEN QACCDCTR.
0257	REF	1		1 2734 1		TCF	LCCP3	
0258	REF	311	LAST 1479	3 4755 1		CAF	ZERO	ACCDCTR AND ACCDCTR ARE NOT NEGATIVE,
0259	REF	899	LAST 1480	54 154 0	LCCP3	TS	MPAC	BECAUSE THEY ARE MAGNITUDES
0260	REF	913	LAST 1480	3 0155 0		CA	MPAC +1	
0261	REF	901	LAST 1480	50 154 1		INDEX	MPAC	MASK CHANNEL IMAGE FOR ANY GIMBAL MOTION
0262	REF	1		7 3077 0		MASK	GIMBLBTS	
0263			20,2740	0 0006 1		EXTEND		
0264	REF	1		1 2755 0		PZF	ZACCDCTR	IF NONE, Q(P)ACCDCTR IS ZERO.
0265	REF	912	LAST 1480	3 0155 0		CA	MPAC +1	
0266	REF	913	LAST 1480	50 154 1		INDEX	MPAC	GIMBAL IS MOVING. IS RETATION POSITIVE.
0267	REF	2	LAST 1480	7 3100 1		MASK	GIMBLBTS +1	
0268			20,2745	0 0006 1		EXTEND		
0269	REF	1		1 2752 1		PZF	FIRSTZERO	IF NOT POSITIVE, BRANCH
0270	REF	914	LAST 1480	50 154 1		INDEX	MPAC	POSITIVE RETATION, NEGATIVE Q(R)ACCDCTR.
0271	REF	7	LAST 1480	4 1507 0		CS	ACCDCTR	
0272	REF	1		1 2756 0		TCF	STACCDCTR	
0273	REF	915	LAST 1480	50 154 1	FPSTZER0	INDEX		NEGATIVE RETATION, POSITIVE Q(R)ACCDCTR.
0274	REF	8	LAST 1480	3 1507 1		CA	ACCDCTR	
0275	REF	2	LAST 1480	1 2756 0		TCF	STACCDCTR	
0276	REF	312	LAST 1480	3 4755 1	ZACCDCTR	CAF	ZFPO	

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0277	REF	906	LAST	1480	20,2756	50 154 1	STACCDCT	INDEX	MFAC	
0278	REF	6	LAST	1473	20,2757	55 151 0	TS	QACCDCT		STORE G(P) ACCDCT.
0279	REF	907	LAST	1481	20,2760	10 154 0	CLS	MFAC		
0280	REF	2	LAST	1480	20,2761	1 2733 0	TCF	LCOP3 -1		NEW DC G/CCDCT.
0291	REF	60	LAST	1476	20,2762	4 0111 1	CS	DAPBOOLS		IS GIMBAL USABLE?
0282	REF	6	LAST	1442	20,2762	7 4736 0	MASK	USECFJTS		
0283					20,2764	0 0006 1	EXTEND			
0284	REF	1			20,2765	1 3712 1	BZF	DWNGTS		NO. BE SURE THE GIMBAL SWITCHES ARE DOWN
0285	REF	5	LAST	1403	20,2766	4 1263 0	CS	T5ADR		YES. IS THE CAP RUNNING?
0286	REF	1			20,2767	6 3772 0	AD	PAXISADR		
0287					20,2770	0 0006 1	EXTEND			
0288					20,2771	1 2773 1	BZF	+2		
0289	REF	2	LAST	1481	20,2772	1 3712 1	TCF	DWNGTS		NO. BE SURE THE GIMBAL SWITCHES ARE DOWN
0290	REF	6	LAST	1462	20,2772	11 1633 1	CCS	INGTS		YES. IS GTS IN CONTROL?
0291	REF	1			20,2774	1 2777 0	TCF	DOCKTEST		YES. PROCEED WITH 1/ACCS.
0292	REF	63	LAST	1470	20,2775	1 4674 0	TC	IBNKCALL		NO. NULL OFFSET AND FIND ALLOWETS
0293	REF	2	LAST	1440	20,2776	43321 0	CADR	TIMEGMBL		
0294	REF	4	LAST	1477	20,2777	10 157 0	DOCKTEST	CCS	DOCKTEMP	BYPASS 1/ACCNT WHEN DOCKED.
0295	REF	1			20,3000	1 3675 1	TCF	1/ACCRET		
0296	REF	2	LAST	1475	20,3001	1 3235 1	TCF	1/ACCNT		

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P0297 SUBROUTINE: DVCVSLB

RC298 AUTHOR: C. WICK, MCD 12 JUNE 68

R0299 PURPOSE: THIS SUBROUTINE PROVIDES A SINGLE-PRECISION MACHINE LANGUAGE DIVISION OPERATION WHICH RETURNS

R0301 (1) THE QUOTIENT, IF THE DIVISOR WAS NORMAL.

R0302 (2) NEGMAX, IF THE QUOTIENT WAS IMPROPER AND NEGATIVE.

R0303 (3) POSMAX, IF THE QUOTIENT WAS IMPROPER AND POSITIVE OR IF THERE WAS A ZERO DIVISOR.

R0305 THE CALLING PROGRAM IS PRESUMED TO BE A JOB IN THE F BANK WHICH CONTAINS DVCVSUB. E BANK MUST BE 6.

R0307 THE DIVISOR FOR THIS ROUTINE MAY BE IN EITHER FIXED OR EPASABLE STORAGE. SIGN AGREEMENT IS

R0309 ASSUMED BETWEEN THE TWO HALVES OF THE DIVIDEND. (THIS IS CERTAIN IF THE A AND L REGISTERS ARE THE RE-

R0311 SULT OF A MULTIPLICATION OPERATION.)

R0312 CALL SEQUENCE:

A0313	L	TO	DVCVSLB
A0314	L +1	ADRES	(DIVISOR)
A0315	L +2	RETURN HERE,	WITH RESULT IN A,L

R0316 INPUT: DIVIDEND IN A,L (SIGN AGREEMENT ASSUMED), DIVISOR IN LOCATION DESIGNATED BY "ADRES".
 R0318 DIVISOR MAY BE IN THE DVCVSUB FBANK, FIXFC-FIXED FBANK, FBANK 6, OR LMSWITCHED ERASABLE.

R0320 OUTPUT: QUOTIENT AND REMAINDER, OR POSMAX (NEGMAX), WHICHEVER IS APPROPRIATE.

R0322 DEFERIS: SCRATCHX, SCRATCHY, SCRATCHZ, A,L (NOTE: SCRATCHX,Y,Z ARE EQUATED TO MPAC +4,+5, AND +6.)

R0324 ABORTS OR ALARMS: NONE

R0325 EXITS: TO THE CALL POINT + 2.

R0326 SUBROUTINES CALLED: NONE.

0327	REF	1	20,3002	54 161 0	DVCVSLB	TS	SCRATCHY	SAVE UPPER HALF OF DIVIDEND
0328	REF	1	20,3003	54 161 1		TS	SCRATCHX	
0329	REF	427	LAST 1474	20,3004	50 002 0		INDEX	C
0330				20,3005	3 0000 1		CA	0
0331	REF	428	LAST 1482	20,3006	24 002 0		INCP	Q
0332	REF	529	LAST 1476	20,3007	50 000 1		INDEX	A
0333				20,3010	3 0000 1		CA	0
0334				20,3011	0 0006 1		EXTEND	
0335	REF	1		20,3012	1 3041 0		BZF	MAXPLLS
0336	REF	1		20,3013	54 162 0		TS	SCRATCHZ
0337	REF	530	LAST 1482	20,3014	10 000 0		CCS	A
0338	REF	70	LAST 1473	20,3015	6 4753 1		AD	BIT1
0339	REF	1		20,3016	1 3020 1		TCF	ZEROPLUS
0340	REF	71	LAST 1482	20,3017	6 4753 1		AD	BIT1
0341	REF	2	LAST 1482	20,3020	56 161 1	ZEROPLUS	XCH	SCRATCHY
0342				20,3021	0 0006 1		EXTEND	
0343	REF	1		20,3022	6 3024 1		EZMF	GOODNEE

STORE ABS(DIVISOR). PICK UP TCF HALF OF
 DIVIDEND.
 GET -AES(DIVIDEND)

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0344	REF 531	LAST 1482	20,3023	4 0001 0	CS	A	
0345	REF 3	LAST 1482	20,3024	6 0161 1	GOODNEG	AD	SCRATCHY
0346			20,3025	7 0005 1		EXTEND	ABS(DIVISCF) - ABS(DIVIDEND)
0347	REF 1		20,3026	6 3033 1	BZMF	MAKEMAX	BRANCH IF DIVISION IS NOT PROPER.
0348	REF 2	LAST 1482	20,3027	3 0160 0	CA	SCRATCHX	RE-ESTABLISH THE DIVIDEND.
0349			20,3030	0 0006 0	EXTEND		
0350	REF 2	LAST 1482	20,3031	10 162 0	DV	SCRATCHZ	QUOTIENT IN THE A, REMAINDER IN L.
0351	REF 429	LAST 1482	20,3032	0 0002 0	TC	Q	RETURN TO CALLER.
0352	REF 3	LAST 1482	20,3033	10 160 1	MAKEMAX	CCS	SCRATCHX
0353	REF 3	LAST 1482	20,3034	10 162 0	CCS	SCRATCHZ	DETERMINE THE SIGN OF THE QUOTIENT.
0354	REF 2	LAST 1482	20,3035	1 3041 0	TCF	MAXPLUS	SCRATCHX AND SCRATCHZ ARE NON-ZERO.
0355	REF 4	LAST 1483	20,3036	10 162 0	CCS	SCRATCHZ	
0356	REF 13	LAST 1479	20,3037	3 4735 1	CAF	NEGMAX	
0357	REF 430	LAST 1483	20,3040	0 0002 0	TC	Q	+, - OR -, +
0358	REF 42	LAST 1478	20,3041	3 4733 1	MAXPLLS	CAF	PCSMAX
0359	REF 431	LAST 1483	20,3042	0 0002 0	TC	Q	-, - OR +, +

R0360 COEFFICIENTS FOR THE JET ACCELERATION CURVE FITS

R0361 THE CURVE FITS ARE OF THE FORM -

R0362 $1JACC = A/(MASS + C) + E$

R0363 A IS SCALED AT PI/4 RAD/SEC**2 B+16KG, B IS SCALED AT PI/4 RAD/SEC**2, AND C IS SCALED AT B +16 KG.

R0365 THE CURVE FIT FOR L,PVT-CC IS OF THE SAME FORM, EXCEPT THAT A IS SCALED AT 8 FT B+16 KG, B IS SCALED AT 8 FT, AND C IS SCALED AT B+16 KG.

0368		20,3043	01240 0	2DEC	+00410511917	L	A	DESCENT
0368		20,3044	22513 0					
0369		20,3045	00141 0	INERCCNA 2DEC	+00059347674	1JACCF	A	DESCENT
0369		20,3046	07416 0					
0370		20,3047	00030 1	2DEC	+00014979264	1JACCQ	A	DESCENT
0370		20,3050	21261 1					
0371		20,3051	00021 1	2DEC	+00010451889	1JACCR	A	DESCENT
0371		20,3052	02766 0					
0372		20,3053	00153 0	2DEC	+00065443852	1JACCF	A	ASCENT
0372		20,3054	07111 1					
0373		20,3055	00072 1	2DEC	+00035784354	1JACCQ	A	ASCENT
0373		20,3056	24113 0					
0374		20,3057	00135 0	2DEC	+00056946631	1JACCR	A	ASCENT
0374		20,3060	11511 1					
0375		20,3061	04754 0	DEC	+0155044	L	E	DESCENT
0376		20,3062	77142 0	DEC	-0025233	L	C	DESCENT

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0377	20,3063	00061 0	INERCCNE	DEC	+0002989	1JACCP	E	DESCENT
0378	20,3064	00217 0	INERCCNC	DEC	+0008721	1JACCP	C	DESCENT
0379	20,3065	00464 1		DEC	+0018791	1JACCP	B	DESCENT
0380	20,3066	75642 0		DEC	-0008163	1JACCP	C	DESCENT
0381	20,3067	00536 1		DEC	+0021345	1JACCP	E	DESCENT
0382	20,3070	75715 1		DEC	-0006027	1JACCP	C	DESCENT
0383	20,3071	00001 0		DEC	+0000132	1JACCP	E	ASCENT
0384	20,3072	77616 0		DEC	-0006923	1JACCP	C	ASCENT
0385	20,3073	05154 1		DEC	+0162862	1JACCP	B	ASCENT
0386	20,3074	00052 0		DEC	+0002588	1JACCP	C	ASCENT
0387	20,3075	00231 1		DEC	+0009312	1JACCP	B	ASCENT
0388	20,3076	77174 0		DEC	-0023608	1JACCP	C	ASCENT

0389	20,3077	01400 1	GIMBLETS	CCTAL	01400			
0390	20,3100	01000 0		CCTAL	01000			
0391	20,3101	06000 1		CCTAL	06000			
0392	20,3102	04000 0		CCTAL	04000			
0393	20,3103	23146 0	CCEF	DEC	0.6			.2 SCALED AT 1/2
0394	20,3104	12241 1	0.35356	DEC	0.35356			.70711 SCALED AT 2
0395	20,3105	05337 0	GEFACTM	CCT	337			979.24/2.20462 AT B+15
0396	20,3106	26501 1	.7071	DEC	.70711			
0397	20,3107	51276 0	-.7071	DEC	-.70711			
0398	20,3110	62362 1	-EPSMAX	DEC	-.42265			

R0399 CSM-DOCKED INERTIA COMPUTATIONS

0400	REF 175	LAST 1479	20,3111	3 4753 1	DOCKED	CA	ONE	CCECTR = 1 FOR INERTIA COEFFICIENTS
0401	REF 1		20,3112	54 161 1	SPSLCCP1	TS	CCEFFCTR	= 7 FOR CG COEFFICIENTS
0402	REF 176	LAST 1484	20,3113	3 4753 1		CA	ONE	MASSCTR = 1 FOR CSM
0403	REF 1		20,3114	54 161 0		TS	MASSCTR	= 0 FOR LEM
0404	REF 2	LAST 1484	20,3115	50 160 0		INDEX	CCEFFCTR	
0405	REF 1		20,3116	3 2216 1		CA	CCEFF -1	CCEFF -1 = C
0406			20,3117	0 0006 1		EXTEND		
0407	REF 19	LAST 1478	20,3120	7 1326 0		MP	LEMMASS	
0408			20,3121	0 0106 1		EXTEND		
0409	REF 7	LAST 1477	20,3122	7 1327 1		MP	CSMASS	LET X = CSMASS AND Y = LEMMASS
0410	REF 3	LAST 1484	20,3123	50 160 0		INDEX	CCEFFCTR	
0411	REF 2	LAST 1484	20,3124	6 3217 0		AD	COEFF	COEFF = F
0412	REF 508	LAST 1481	20,3125	54 154 0		TS	MPAC	MPAC = C X Y + F
0413			20,3126	1 2132 0		TCF	+4	
0414	REF 2	LAST 1484	20,3127	54 161 0	SPSLCCP2	TS	MASSCTR	LOOP TWICE THROUGH HERE TO OBTAIN
0415			20,3130	0 0006 1		EXTEND		MPAC = MPAC + (A X + D)X + (B Y + F)Y
0416	REF 4	LAST 1484	20,3131	26 165 1		DIM	CCEFFCTR	LCCP #1 LCCP #2
0417	REF 5	LAST 1484	20,3132	50 160 0		INDEX	CCEFFCTR	
0418	REF 3	LAST 1484	20,3133	3 2221 0		CA	CCEFF +2	CCEFF +2 = A CR B
0419			20,3134	0 0006 1		EXTEND		

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0420	REF	3	LAST	1484	20,3135	5 0161 1	INDEX	MASSCTR	
0421	REF	20	LAST	1484	20,3136	7 1326 0	MP	LEMMASS	
0422	REF	6	LAST	1484	20,3137	50 160 0	INDEX	CCEFCCTR	
0423	REF	4	LAST	1484	20,3140	6 2223 1	AD	CCEFF +4	CCEFF +4 = E OR D
0424					20,3141	0 0006 1	EXTEND		
0425	REF	4	LAST	1485	20,3142	5 0161 1	INDEX	MASSCTR	
0426	REF	21	LAST	1485	20,3143	7 1326 0	MP	LEMMASS	
0427	REF	509	LAST	1484	20,3144	26 154 0	ACS	MFAC	
0429	REF	5	LAST	1485	20,3145	10 161 0	CCS	MASSCTR	
0429	REF	1			20,3146	1 3127 1	TCF	SPSL00P2	
0430	REF	7	LAST	1485	20,3147	10 160 1	CCS	CCEFCCTR	IF CCEFCCTR IS PCS, EXIT FROM LGCP WITH
0431					20,3150	1 3157 0	TCF	+7	CG X DELCCT = MPAC X 4 PI RAD-CM/SEC
0432					20,3151	00000 1	TCRQCENS	2DEC	0.51443 R-14
0432					20,3152	20354 1			
0433	REF	911	LAST	1485	20,3153	3 0154 1	CA	MFAC	
0434	REF	511	LAST	1485	20,3154	54 155 1	TS	MFAC +1	INERTIA = (MPAC +1) X 2(3E) KG-CM(2)
0435	REF	25	LAST	1471	20,3155	3 4757 0	CA	SEVEN	
0436	REF	1			20,3156	1 3112 1	TCF	SPSL00CP1	
0437	REF	1			20,3157	3 3216 1	CA	1JACCCON	1JACC=1JACCCON/MASS
0438					20,3160	22 007 0	ZL		
0439	REF	4	LAST	1480	20,3161	0 3102 0	TC	DVQVSUB	
0440	REF	17	LAST	1479	20,3162	01243 0	ADRES	MASS	
0441	REF	9	LAST	1478	20,3163	551530 1	TS	1JACC	SCALED AT PI/4
0442	REF	43	LAST	1483	20,3164	3 4733 1	CA	PCSMAX	SFT INVERSE JET ACCELERATIONS TO POSMAX,
0443	REF	2	LAST	1425	20,3165	551551 0	TS	1/ANETP	WHICH CORRESPONDS TO ACCEL. OF 1.4 G/SS.
0444	REF	3	LAST	1454	20,3166	551571 1	TS	1/ANET2 +1	
0445	REF	4	LAST	1485	20,3167	551572 1	TS	1/ANET2 +2	
0446	REF	5	LAST	1485	20,3170	551611 1	TS	1/ANET2 +17C	
0447	REF	6	LAST	1485	20,3171	551612 1	TS	1/ANET2 +18C	
0448					20,3172	0 0006 1	EXTEND		
0449	REF	1			20,3173	3 3152 1	DCA	TCRQCENS	
0450					20,3174	0 0006 1	EXTEND		
0451	REF	512	LAST	1485	20,3175	1 155 1	DV	MFAC +1	
0452					20,3176	0 0004 0	INFINT		
0453	REF	6	LAST	1480	20,3177	551531 0	TS	1JACCG	SCALED AT PI/4
0454	REF	6	LAST	1480	20,3200	551532 0	TS	1JACCR	
0455	REF	2	LAST	1479	20,3201	3 3107 1	CA	-0.7071	
0456	REF	7	LAST	1475	20,3202	551627 1	TS	CCEFFC	CCEFFC AND CCEFFR ARE CHOSEN TO MAKE U-
0457	REF	2	LAST	1478	20,3203	3 3106 0	CA	0.7071	AND V-AXES CRITICAL FOR CHECKED CASE
0458	REF	6	LAST	1479	20,3204	551630 1	TS	CCEFFR	
0459	REF	18	LAST	1485	20,3205	3 1243 0	CA	MASS	SCALED AT 2(16) KG
0460					20,3206	0 0006 1	EXTEND		
0461	REF	512	LAST	1485	20,3207	7 0154 0	MP	MFAC	SCALED AT 4 PI RAD-CM/SEC
0462					20,3210	0 0006 1	EXTEND		
0463	REF	7	LAST	1479	20,3211	7 1245 1	MP	ARDELV	SCALED AT 2(13) CM/SEC(2)
0464	REF	5	LAST	1485	20,3212	0 0002 0	TC	DVQVSUB	GFT QUOTIENT WITH OVERFLOW PROTECTION

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0465 RFF 914 LAST 1485 20,3213 00155 0 ADRES MPAC +1

0466 RFF 4 LAST 1486 20,3214 551511 1 TS ACCDCTR

0467 RFF 1 20,3215 1 2716 1 TCF SPSCONT

CONTINUE K, KSG CALCULATIONS

0468 20,3216 00167 1 1JACCCCN COT 00167

SCALFC AT PI/4X2(16) PAD/SEC(2)-KG

A0469

A0470

COEFFICIENTS FOR CURVE FIT OF THE FORM $Z = A X^2 + B Y^2 + C X Y + D X + E Y + F$

0471 20,3217 06176 1 COEFF DEC .19518

C COEFFICIENT OF INERTIA

0472 20,3220 77650 1 DEC -.00529

F ''

0473 20,3221 72260 0 DEC -.17670

B ''

0474 20,3222 76637 1 DEC -.3709

A ''

0475 20,3223 02167 0 DEC .06974

F ''

0476 20,3224 00645 0 DEC .02569

D ''

0477 20,3225 06335 1 DEC .20056

C COEFFICIENT OF CG

0478 20,3226 04256 1 DEC .13564

F ''

0479 20,3227 30163 0 DEC .75704

E ''

0480 20,3230 64.72 0 DEC -.37142

A ''

0481 20,3231 53632 0 DEC -.63117

E ''

0482 20,3232 15133 1 DEC .41175

D ''

R0483 ASSIGNMENT OF TEMPORARIES FOR 1/ACCS (EXCLUDING 1/ACCONT)

A0484 MPAC, MPAC +1, MPAC +2 USED EXPLICITLY

0485 RFF 915 LAST 1486 0160 COEFFCTR EQUALS MPAC +4

0486 RFF 916 LAST 1486 0161 MASSCTR EQUALS MPAC +5

0487 RFF 917 LAST 1486 0160 SCRATCHX EQUALS MPAC +4

SCRATCH AREA FOR EVOVSUB ROUTINE.

0488 RFF 4 LAST 1483 0161 SCRATCHY EQUALS SCRATCHX +1

0489 RFF 5 LAST 1486 0162 SCRATCHZ EQUALS SCRATCHX +2

0490 RFF 918 LAST 1486 0157 DOCKTEMP EQUALS MPAC +3

RECORD OF CSMCCKEE BIT OF CAPECOLS

0491 RFF 919 LAST 1486 0155 EPSILON EQUALS MPAC +1

0492 RFF 5 LAST 1478 0166 -EPSILON EQUALS EPSILON

0493 20,3233 71777 0 -.1875 DEC -.18750

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0537	REF	1		20,3300	0 3704 1	TC	INVERT	
0538				20,3301	0 0004 0	ININT		
0539	REF	3	LAST 1485	20,3302	55'551 0	TS	1/ANETP	F AXIS DATA MUST BE CONSISTENT
0540	REF	4	LAST 1488	20,3303	55'552 0	TS	1/ANETP +1	SCALED AT 2(7)/PI.
0541	REF	38	LAST 1487	20,3304	4 4743 1	CS	BIT9	-1 AT 2(6)
0542				20,3305	0 0006 1	EXTEND		
0543	REF	5	LAST 1488	20,3306	7 1551 0	MP	1/ANETP	-1/ANET AT 2(13)/PI
0544				20,3307	0 0006 1	EXTEND		
0545	REF	2	LAST 1497	20,3310	10 157 0	CV	FLNTEM	-1/(ANET + ANET**2/ACCAST) AT 2(7)/PI
0546	REF	1		20,3311	55'557 0	TS	PACCFUN	
0547	REF	2	LAST 1488	20,3312	55'560 1	TS	PACCFUN +1	
0548	REF	1		20,3313	3 4733 1	CA	1/03	NO ADS FOR P AXIS, ACCAST = AMIN
0549	REF	1		20,3314	55'553 1	TS	1/ACCSF	
0550	REF	2	LAST 1488	20,3315	55'554 0	TS	1/ACCSF +1	
0551				20,3316	1 0003 1	REFLINT		
0552				20,3317	22 007 0	ZL		
0553	REF	3	LAST 1487	20,3320	10 116 0	CCS	DRIFTER	
0554	REF	2	LAST 1487	20,3321	53'544 1	CXCH	ADSU	ZFRC ACSU,V IF IN DRIFT, JUST TO BE SURE
0555	REF	313	LAST 1488	20,3322	3 4755 1	LAXIS	CA	DO L AXIS COMPUTATIONS
0556	REF	1		20,3323	54 154 0	TS	UV	ZERO FOR U AXIS, ONE FOR V AXIS.
0557	REF	1		20,3324	54 163 1	BCTHAXES	TS	COORDINATE COMMON TO U,V AXES
0558	REF	2	LAST 1488	20,3325	50 154 1	INDEX	UV	
0559	REF	3	LAST 1488	20,3326	11'543 0	CCS	ACSU	PICK UP ABS(ACSU OR ADSV)
0560	REF	178	LAST 1487	20,3327	6 4753 1	AD	ONE	RESTORE TO PROPER VALUE
0561				20,3331	1 3333 0	TCF	+3	AND LEAVE SIGNACS AT ZERO
0562	REF	175	LAST 1488	20,3331	6 4753 1	AC	ONE	NEGATIVE, RESTORE TO PROPER VALUE
0563	REF	2	LAST 1488	20,3332	24 163 0	INCR	SIGNADS	AND SET SIGNACS TO ONE TO SHOW ACS NEG
0564	REF	1		20,3333	54 162 0	TS	ABSACS	SAVE ABS(ACS)
0565	REF	3	LAST 1488	20,3334	4 0163 1	CS	SIGNACS	
0566	REF	1		20,3335	54 164 0	TS	-SIGNADS	USED AS AN INDEX
0567	REF	2	LAST 1497	20,3336	3 1343 1	CA	DBVAL1	SET DB1, DB2 TO DBVAL1 (= DB)
0568	REF	1		20,3337	54 142 0	TS	DBB1	
0569	REF	1		20,3340	54 144 1	TS	DBB2	
0570	REF	2	LAST 1488	20,3341	3 0162 1	CA	ABSACS	TEST MAGNITUDE OF ABS(ADS)
0571	REF	1		20,3342	6 3770 1	AD	-0.03R/S2	
0572				20,3343	0 0006 1	EXTEND		
0573	REF	1		20,3344	6 3436 0	BZMF	NOTMUCH	ABS(ACS) LESS THAN AMIN
0574	REF	2	LAST 1487	20,3345	10 151 1	CCS	FLATEMP	ABS(ACS) GREATER THAN AMIN
0575	REF	1		20,3346	1 3376 1	TCF	SKIPCP1	I DRIFT OR GTS, DO NOT COMPLETE DB
0576	REF	3	LAST 1488	20,3347	3 1343 1	CA	DBVAL1	
0577	REF	2	LAST 1488	20,3350	50 164 1	INDEX	-SIGNADS	

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0578	REF	2	LAST	1488	20,3351	26	144	1	ADS	DBR2	DB2(1) = 2 DB
0579	REF	4	LAST	1488	20,3352	50	163	0	INDEX	SIGNACS	
0580	REF	1			20,3353	54	145	0	TS	DBR4	DB4(3) = 1 DB
0581	REF	1			20,3354	3	323	0	CA	-.1875	-.1875 PI/2 RAD/SEC(2) SCALED AT PI/2
0582	REF	3	LAST	1488	20,3355	6	0162	1	AD	ABSACS	ABSACS IS SCALED AT PI/2
0583					20,3356	0	0006	1	EXTEND		
0584					20,3357	6	3362	0	BZMF	+3	
0585	REF	2	LAST	1487	20,3360	4	0115	0	CS	DEVAL3	-.5 DB
0586	REF	1			20,3361	1	2371	0	TCF	DBONE	
0587	REF	4	LAST	1489	20,3362	4	0162	1	CS	ABSACS	
0588					20,3363	6	0000	1	DOUBLE		
0589					20,3364	6	0000	1	DOUBLE		
0590	REF	89	LAST	1475	20,3365	6	4736	1	AD	BIT14	
0591					20,3366	6	0000	1	DOUBLE		1-8 ABSACS. (8 IS 16/PI SCALED AT 2/PI)
0592					20,3367	0	0006	1	EXTEND		
0593	REF	7	LAST	1487	20,3370	7	1343	0	MF	DB	
0594	REF	5	LAST	1489	20,3371	52	163	0	DBONE	INDEX	DB1(2)=(1-8 ABSACS) DB. IF ABSACS IS GREATER THAN .1875 THEN DB1(2)=-.5 DB
0595	REF	2	LAST	1488	20,3372	54	143	0	TS	DBR1	
0596	REF	2	LAST	1487	20,3373	3	0114	0	CA	DEVAL2	
0597	REF	3	LAST	1488	20,3374	53	164	1	INDEX	-SIGNACS	
0598	REF	1			20,3375	54	146	0	TS	DBR3	DB3(4) = -.75 DB
0599	REF	5	LAST	1489	20,3376	3	0162	1	SKIPDB1	CA	ABSACS
0600					20,3377	0	0006	1	EXTEND		
0601	REF	43	LAST	1465	20,3400	7	4740	1	MF	BIT12	
0602	REF	6	LAST	1489	20,3401	6	0162	1	AD	ABSACS	(9/8) ABSACS.
0603	REF	2	LAST	1488	20,3402	0	3704	1	TC	INVERT	ALL RIGHT TO DIVIDE
0604	REF	4	LAST	1489	20,3403	5	164	1	INDEX	-SIGNACS	
0605	REF	1			20,3404	54	130	1	TS	1/ACOSTT +1	1/ACOSTPOS(NEG) = 1/ABS(ACS)
0606	REF	2	LAST	1488	20,3405	3	4733	1	CA	1/.02	
0607	REF	6	LAST	1489	20,3406	50	163	0	INDEX	SIGNACS	
0608	REF	2	LAST	1489	20,3407	54	127	1	TS	1/ACOSTT	1/ACOSTNEG(POS) = 1/ANIN
0609	REF	7	LAST	1489	20,3410	3	0162	1	CA	ABSACS	
0610	REF	4	LAST	1479	20,3411	6	1533	0	AD	1JACCL	
0611	REF	5	LAST	1489	20,3412	6	1533	0	AD	1JACCU	2 JACC + ABS(ACS)
0612	REF	39	LAST	1488	20,3413	6	4743	0	AD	BIT9	MAXIMUM VALUE IN COMPUTATIONS
0613	REF	535	LAST	1487	20,3414	54	000	0	TS	A	TEST FOR OVERFLOW
0614	REF	1			20,3415	1	3462	0	TCF	SKIPDB2	NO OVERFLOW, DO NORMAL COMPUTATION
0615	REF	8	LAST	1489	20,3416	3	162	1	CA	ABSACS	RESCALE TO PI TO PREVENT OVERFLOW
0616					20,3417	0	0006	1	EXTEND		
0617	REF	50	LAST	1489	20,3420	7	4736	0	MF	BIT14	
0618	REF	6	LAST	1489	20,3421	6	1533	0	AD	1JACCU	1 JACC AT PI/2 = 2JACC AT PI
0619	REF	1			20,3422	54	157	0	TS	ANET	ANETPOS(NEG) MAX SCALED AT PI = ANETPOS(NEG) MAX/ACOSTNEG(POS) AT 2(7)
0620											1 + ANETPOS/ACOSTNEG AT 2(7)
0621	REF	44	LAST	1433	20,3423	6	4744	1	AD	BIT8	SAVE IN ANET, WHILE PICKING UP ANET
0622	REF	2	LAST	1489	20,3424	56	157	1	XCH	ANET	
0623	REF	3	LAST	1489	20,3425	0	3704	1	TC	INVERT	
0624					20,3426	0	0006	1	EXTEND		

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0625	RFF	91	LAST 1485	20,3427	7 4736 0	MF	BIT14	SCALE 1/ANET AT 2(7)/PI
0626	RFF	1		20,3430	54 160 1	TS	1/ANET	
0627	RFF	1		20,3431	3 3435 0	CA	ACCHERE	SFT UP RETURN FROM COMPUTATION ROUTINE
0628	RFF	1		20,3432	54 161 0	TS	ARIT	
0629	RFF	45	LAST 1485	20,3433	4 4744 0	CS	BITR	-1 AT 2(7)
0630	RFF	1		20,3434	1 3737 0	TCF	DCACCFUN	FINISH ACCFUN COMPUTATION
0631	RFF	1		20,3435	1 3467 0	ACCHERE	TCF	ACCTHERE
0632	RFF	312	LAST 1487	20,3436	54 001 1	ACTMUCH	TS	L
0633	RFF	3	LAST 1489	20,3437	3 4733 1	CA	1/.03	ABS(ACS) LESS THAN AMIN, SAVE IN L
0634	RFF	3	LAST 1489	20,3440	54 127 1	TS	1/ACOSTT	ACCASTPCS, NEG = AMIN
0635	RFF	4	LAST 1490	20,3441	54 130 1	TS	1/ACOSTT +1	
0636	RFF	3	LAST 1488	20,3442	1 151 0	CCS	FLATEMP	
0637	RFF	2	LAST 1489	20,3443	1 3462 0	TCF	SKIPCE2	CC NOT COMPLETE DB IF DRIFT CR CTS
0638	RFF	1		20,3444	3 3771 0	CA	.023R/S2	.0228 RAC/SEC(2)
0639	RFF	313	LAST 1490	20,3445	6 001 0	AD	L	L=ABS(ACS)-AMIN=ABS(ACS)-.0245RAC/SEC(2)
0640	RFF			20,3446	0 000 1	EXTEND		RESULT IS ABS(ACS)-.0017 RAC/SEC(2)
0641	RFF	1		20,3447	6 2457 1	BZMF	NCAOS	ABS(ACS) LESS THAN .0017 RAC/SEC(2)
0642	RFF	5	LAST 1489	20,3450	3 0115 1	CA	DBVAL3	.0017 RAC/SEC(2) LT ABS(ACS) LT AMIN
0643	RFF	3	LAST 1489	20,3451	50 164 1	INDEX	-SIGNAOS	
0644	RFF	2	LAST 1489	20,3452	54 146 0	TS	DBR3	DB3(4) = DB/2
0645	RFF	536	LAST 1489	20,3453	6 0000 0	AD	A	
0646	RFF	7	LAST 1489	20,3454	50 163 0	INDEX	SIGNACS	
0647	RFF	2	LAST 1489	20,3455	54 145 0	TS	DBP4	DB4(2) = DB
0648	RFF	3	LAST 1490	20,3456	1 3462 0	TCF	SKIPCE2	
0649	RFF	4	LAST 1488	20,3457	3 1343 1	NCAOS	CA	DBVAL1
0650	RFF	3	LAST 1490	20,3460	54 146 0	TS	DBR3	DB2,4 = DB
0651	RFF	3	LAST 1490	20,3461	54 145 0	TS	DBR4	
0652	RFF	9	LAST 1489	20,3462	3 0162 1	SKIPDB2	CA	ABSACS
0653	RFF	7	LAST 1489	20,3463	6 1533 0	AD	1JACCU	ANETPCS(MFC) MAX = 2 JACC + ABS(ACS)
0654	RFF	8	LAST 1490	20,3464	6 1532 0	AD	1JACCL	
0655	RFF	3	LAST 1489	20,3465	54 157 0	TS	ANET	CANNOT OVERFLOW HERE
0656	RFF	1		20,3466	0 3730 0	CLL/NET+	TC	CCMPUTE 1/ANET, ACCFUN
0657	RFF	6	LAST 1490	20,3467	50 164 1	ACCTHERE	INDEX	-SIGNAOS
0658	RFF	1		20,3470	54 134 0	TS	25TEM +2	STORE ACCFUN IN TEMPORARY BUFFER
0659	RFF	2	LAST 1490	20,3471	3 0160 0	CA	1/ANET	
0660	RFF	7	LAST 1490	20,3472	50 164 1	INDEX	-SIGNAOS	
0661	RFF	1		20,3473	54 125 0	TS	1/ATEM2 +2	STORE 1/ANET IN TEMPORARY BUFFER
0662	RFF	10	LAST 1490	20,3474	3 0162 1	CA	ABSACS	SEE IF OVERFLOW IN MIN CASE
0663	RFF	9	LAST 1490	20,3475	6 1533 0	AD	1JACCL	
0664	RFF	40	LAST 1489	20,3476	6 4742 0	AD	BIT9	MAXIMUM POSSIBLE VALUE

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0665	REF	537	LAST	1490	20,3477	54 000 0	TS	A	CVERFLOW POSSIBLE BUT REMOTE
0666					2,3510	1 3502 1	TCF	+2	
0667	REF	44	LAST	1485	20,3511	2 4733 1	CA	PCSMAX	IF CVERFLOW, TRUNCATE TO PI/2
0668	REF	2	LAST	148E	20,3512	6 3770 1	AD	-0.03R/S2	RESTORE TO CORRECT VALUE
0669	REF	4	LAST	1490	20,3513	54 157 0	TS	ANET	
0670	REF	2	LAST	1490	20,3514	0 3730 0	TC	DO1/NET+	COMPLETE 1/ANET, ACCFUN
0671	REF	8	LAST	1490	20,3515	50 164 1	INDEX	-SIGNACS	STORE MIN VALUES JUST AS MAX VALUES
0672	REF	2	LAST	1490	20,3516	54 132 0	TS	ZITEM	
0673	REF	3	LAST	1490	20,3517	3 0160 0	CA	1/ANET	
0674	REF	9	LAST	1491	20,3510	50 164 1	INDEX	-SIGNACS	
0675	REF	2	LAST	1490	20,3511	54 124 1	TS	1/ATEM2	
0676	REF	11	LAST	1490	20,3512	4 0162 0	CS	ABSACS	NOW DO NEG(PCS) CASES
0677	REF	10	LAST	1490	20,3513	6 1533 0	AD	1JACCL	
0678	REF	11	LAST	1491	20,3514	6 1533 0	AD	1JACCL	ANETNEG(PCS) MAX
0679	REF	1			20,3515	0 3716 1	TC	1/ANET-	COMPUTE 1/ANET, ACCFUN, AND ACCSW
0680	REF	8	LAST	1490	20,3516	50 162 0	INDEX	SIGNACS	STORE NEG(PCS) VALUES JUST AS PCS(NEG)
0681	REF	1			20,3517	54 133 1	TS	ZITEM +2	
0682	REF	314	LAST	1490	20,3520	54 001 1	TS	L	SAVE IN L FOR POSSIBLE FUTURE USE
0683	REF	4	LAST	1491	20,3521	3 0160 0	CA	1/ANET	
0684	REF	5	LAST	1491	20,3522	50 163 0	INDEX	SIGNACS	
0685	REF	1			20,3523	54 125 0	TS	1/ATEM1 +2	
0686	REF	17	LAST	1491	20,3524	4 0162 0	CS	ABSACS	
0687	REF	12	LAST	1491	20,3525	6 1533 0	AD	1JACCU	1/ANETNEG(PCS) MIN
0688	REF	5	LAST	1491	20,3526	54 157 0	TS	ANET	
0689	REF	3	LAST	1491	20,3527	6 3770 1	AD	-0.03R/S2	TEST FOR AMIN
0690					20,3530	0 0006 1	EXTEND		IF ANET LESS THAN AMIN, STORE MAX JET
0691	REF	1			20,3531	6 3747 0	BZMF	FIXMIN	VALUES FOR MIN JETS AND SET ACCSW
0692	REF	1			20,3532	0 3724 0	TC	1/NETMIN	OTHERWISE DO MIN JET COMPUTATIONS
0693	REF	10	LAST	1491	20,3533	50 163 0	INDEX	SIGNACS	STORE VALUES
0694	REF	2	LAST	1491	20,3534	54 131 0	TS	ZITEM	
0695	REF	5	LAST	1491	20,3535	3 0160 0	CA	1/ANET	
0696	REF	11	LAST	1491	20,3536	50 163 0	INDEX	SIGNACS	
0697	REF	2	LAST	1491	20,3537	54 123 0	TS	1/ATEM1	
0698	REF	3	LAST	148E	20,3540	50 154 1	INDEX	UV	
0699	REF	1			20,3541	3 3775 1	CA	+UMASK	
0700	REF	9	LAST	144E	20,3542	7 1257 1	MASK	CH5MASK	TEST FOR +U (+V) JET FAILURES
0701					20,3543	0 0004 1	EXTEND		
0702	REF	1			20,3544	1 3551 1	BZF	FAIL-	
0703	REF	3	LAST	1491	20,3545	3 0124 0	CA	1/ATEM2	REPLACE FUNCTION VALUES DEPENDING ON THE
0704	REF	4	LAST	1491	20,3546	54 126 0	TS	1/ATEM2 +2	FAILED JET PAIR WITH CORRESPONDING ONE-
0705	REF	3	LAST	1491	20,3547	3 0132 1	CA	ZITEM	JET (OR AMIN) FUNCTION VALUES
0706	REF	4	LAST	1491	20,3550	54 134 0	TS	ZITEM +2	
0707	REF	4	LAST	1491	20,3551	50 154 1	INDEX	UV	
0708	REF	1			20,3552	3 3773 1	CA	-UMASK	

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0709	REF	10	LAST 1491	20,3553	7 1257 1	MASK	CHEMASK	TEST FOR -U (-V) JET FAILURES
0710				20,3554	0 0006 1	EXTEND		
0711	REF	1		20,3555	1 3562 1	RZF	DEFUN	
0712	REF	3	LAST 1491	20,3556	3 0123 1	CA	1/ATEM1	REPLACE FUNCTION VALUES DEPENDING ON THE
0713	REF	4	LAST 1492	20,3557	54 125 0	TS	1/ATEM1 +2	FAILED JET PAIR WITH CORRESPONDING CASE-
0714	REF	3	LAST 1491	20,3558	3 0131 1	CA	ZITEM	JET (CR AXIN) FUNCTION VALUES
0715	REF	4	LAST 1492	20,3559	54 133 1	TS	ZITEM +2	
0716	REF	4	LAST 1490	20,3562	4 0146 0	DEFUN	CS	DRP3
0717	REF	3	LAST 1489	20,3563	6 0143 1	AD	DBB1	COMPUTE AXISDIST
0718	REF	4	LAST 1490	20,3564	6 0151 1	AD	FLATEMP	
0719	REF	1		20,3565	54 147 1	TS	AXDSTEM	
0720	REF	4	LAST 1490	20,3566	4 0145 0	CS	DBB4	
0721	REF	3	LAST 1489	20,3567	6 0144 0	AD	DBB2	
0722	REF	5	LAST 1492	20,3570	6 0151 1	AD	FLATEMP	
0723	REF	2	LAST 1492	20,3571	54 150 1	TS	AXDSTEM +1	
0724				20,3572	0 0004 0	INHINT		
0725	REF	5	LAST 1491	20,3573	10 154 0	CCS	UV	TEST FOR U OR V AXIS
0726	REF	1		20,3574	1 3616 1	TCF	STCRV	V AXIS STORE V VALUES
0727	REF	1		20,3575	3 0122 0	CA	ACCSW	U AXIS STORE U VALUES
0728	REF	3	LAST 1454	20,3576	55 1547 1	TS	ACCSWL	
0729	REF	1		20,3577	3 4320 1	CA	NINE	TRANSFER 10 WORDS VIA CENTRAN
0730	REF	3	LAST 1369	20,3600	0 5545 0	TC	GENTRAN +1	
0731	REF	5	LAST 1492	20,3601	00123 1	ADRES	1/ATEM1	TEMPORARY BUFFER
0732	REF	12	LAST 1450	20,3602	01567 1	ADRES	1/ANET1	THE REAL PLACE
0733				20,3603	0 0003 1	RELINT		
0734	REF	4	LAST 1492	20,3604	52 144 1	EXCH	DBB1	SAVE U DBS FOR LATER STORING
0735	REF	1		20,3605	52 136 1	DXCH	UCB1	
0736	REF	5	LAST 1492	20,3606	52 146 0	EXCH	DRP4	
0737	REF	1		20,3607	52 140 0	EXCH	UCP4	
0738	REF	3	LAST 1492	20,3610	52 150 1	DXCH	AXDSTEM	
0739	REF	1		20,3611	52 142 1	EXCH	UAXDIST	
0740	REF	180	LAST 1488	20,3612	3 4753 1	CA	CNF	NEW DC V AXIS
0741	REF	6	LAST 1492	20,3613	54 154 0	TS	UV	
0742	REF	214	LAST 1488	20,3614	3 4755 1	CA	ZEPG	
0743	REF	1		20,3615	1 3324 0	TCF	BCTHAXES	AND DO IT AGAIN
0744	REF	2	LAST 1492	20,3616	3 0122 0	STCRV	CA	ACCSW
0745	REF	1		20,3617	55 1550 1	TS	ACCSWL	STORE V AXIS VALUES
0746	REF	2	LAST 1492	20,3620	3 4320 1	CA	NINE	
0747	REF	4	LAST 1492	20,3621	0 5545 0	TC	GENTRAN +1	
0748	REF	6	LAST 1492	20,3622	00123 1	ADRES	1/ATEM1	TEMPORARY BUFFER

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0749	REF	13	LAST	1492	20,3623	31617 1	ADRES	1/ANET1 +16C	THE REAL PLACE
A0750									
0751	REF	6	LAST	1492	20,3624	52 192 0	EXCH	FLATEMP	NEW STORE DEADBANDS FOR ALL AXES
0752	REF	2	LAST	1456	20,3625	53'556 1	EXCH	FLAT	FLAT AND ZONEBLIM
0753	REF	5	LAST	1493	20,3626	3 1243 1	CA	DBVAL1	COMPUTE F AXIS DEADBANDS
0754	REF	1			20,3627	55'561 0	TS	PDB1	
0755	REF	1			20,3630	55'562 0	TS	PDB2	
0756	REF	4	LAST	1493	20,3631	6 1555 0	AD	FLAT	
0757	REF	1			20,3632	55'564 0	TS	PDB3	
0758	REF	1			20,3633	55'563 1	TS	PDB4	
0759	REF	315	LAST	1492	20,3634	3 4755 1	CA	ZERO	
0760	REF	1			20,3635	55'565 1	TS	PAXDIST	
0761	REF	2	LAST	1493	20,3636	55'566 1	TS	PAXDIST +1	
0762	REF	5	LAST	1493	20,3637	11'555 1	CCS	FLAT	
0763	REF	1			20,3640	1 3656 0	TCF	DRFDB	DRIFT CR GTS - COMPUTE DBS
0764	REF	2	LAST	1492	20,3641	52 136 1	EXCH	UCB1	STORE L DEADBANDS
0765	REF	5	LAST	1456	20,3642	53'602 0	EXCH	FIREDB	CANNOT USE GENTRAN BECAUSE OF RELINT
0766	REF	2	LAST	1492	20,3643	52 140 0	EXCH	UDB4	
0767	REF	2	LAST	1453	20,3644	53'604 0	EXCH	CCASTDB	
0768	REF	2	LAST	1492	20,3645	52 142 1	EXCH	UAXDIST	
0769	REF	3	LAST	1456	20,3646	53'606 1	EXCH	AXISDIST	
0770	REF	5	LAST	1492	20,3647	52 144 1	EXCH	DBB1	STORE V AXIS DEADBANDS
0771	REF	6	LAST	1493	20,3650	53'622 1	EXCH	FIREDB +16C	COULD USE GENTRAN IF DESIRED
0772	REF	6	LAST	1492	20,3651	52 146 0	EXCH	DRP4	
0773	REF	3	LAST	1493	20,3652	53'624 1	EXCH	CCASTDB +16C	
0774	REF	4	LAST	1492	20,3653	52 150 1	EXCH	AXDIST	
0775	REF	4	LAST	1493	20,3654	53'626 0	EXCH	AXISDIST +16D	
0776	REF	2	LAST	1481	20,3655	1 3676 1	TCF	1/ACCRET +1	ALL CONF
0777	REF	6	LAST	1493	20,3656	3 1343 1	CA	DBVAL1	DRIFT DEADBANDS
0778	REF	7	LAST	1493	20,3657	55'601 0	TS	FIREDB	
0779	REF	8	LAST	1493	20,3660	55'602 0	TS	FIREDB +1	
0780	REF	9	LAST	1493	20,3661	55'621 1	TS	FIREDB +16D	
0781	REF	10	LAST	1493	20,3662	55'622 1	TS	FIREDB +17C	
0782	REF	6	LAST	1493	20,3663	6 1555 0	AD	FLAT	
0783	REF	4	LAST	1493	20,3664	55'603 1	TS	CCASTDB	
0784	REF	5	LAST	1493	20,3665	55'604 0	TS	CCASTDB +1	
0785	REF	6	LAST	1492	20,3666	55'623 0	TS	CCASTDB +16C	
0786	REF	7	LAST	1493	20,3667	55'624 1	TS	CCASTDB +17C	
0787	REF	316	LAST	1493	20,3670	3 4755 1	CA	ZERO	
0788	REF	5	LAST	1493	20,3671	55'605 1	TS	AXISDIST	
0789	REF	6	LAST	1493	20,3672	55'606 1	TS	AXISDIST +1	
0790	REF	7	LAST	1493	20,3673	55'625 0	TS	AXISDIST +16D	
0791	REF	8	LAST	1493	20,3674	55'626 0	TS	AXISDIST +17D	
0792					20,3675	0 0004 0		1/ACCRET INHINT	

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0793	REF	62	LAST	1487	20,3676	4 0111 1	CS	DABBCOLS	SFT BIT TO INDICATE DATA GOOD.
0794	REF	3	LAST	1491	20,3677	7 4751 1	MASK	ACCSCKEY	
0795	REF	63	LAST	1494	20,3700	26 111 1	ADS	DABBCOLS	
0796					20,3711	0 0003 1	RELINT		
0797	REF	2	LAST	1476	20,3702	3 0117 0	CA	ACCRETRN	
0798	REF	21	LAST	1360	20,3703	0 4640 1	TC	BANKJUMP	RETURN TO CALLER
0799	REF	1			20,3714	54 165 1	INVERT	TS	HOLD
0800	REF	41	LAST	1490	20,3705	3 4743 0	CA	BIT9	ROUTINE TO INVERT - INPUT AT PI/2
0801					20,3716	22 037 0	ZL		1 AT 2(6)
0802					20,3707	0 0006 1	EXTEND		ZERO L FOR ACCURACY AND TO PREVENT CVFLC
0803	REF	2	LAST	1494	20,3710	10 165 1	DV	HOLD	
0804	REF	422	LAST	1482	20,3711	0 0002 0	TC	G	RESULT AT 2(7)/PI
0805	REF	317	LAST	1493	20,3712	3 4755 1	DCWNGTS	CAF	ZERO
0806	REF	7	LAST	1487	20,3713	55 0512 0	TS	ALLOWGTS	ZERO SWITCHES WHEN USEGRJTS BIT IS UP
0807	REF	8	LAST	1487	20,3714	55 0633 1	TS	INETS	OR DAP IS OFF.
0808	REF	2	LAST	1481	20,3715	1 2777 0	TCF	DOCKTEST	
0809					20,3716	22 007 0	1/ANET-	ZL	
0810	REF	3	LAST	1492	20,3717	22 122 0	LXCH	ACCSW	ZFPC ACCSW
0811	REF	6	LAST	1491	20,3720	54 157 0	TS	ANET	SAVE ANET
0812	REF	4	LAST	1491	20,3721	6 3770 1	AC	-0.3R/S2	TEST FOR MIN VALUE
0813					20,3722	0 0006 1	EXTEND		
0814	REF	1			20,3723	5 3744 0	BZMF	NETNEG	ANET LESS THAN AMIN, SO MAKE IT
0815	REF	7	LAST	1494	20,3724	3 0157 1	1/NETMIN	CA	ANET
0816					20,3725	0 0006 1	EXTEND		
0817	REF	10	LAST	1491	20,3726	5 0164 1	INDEX	-SIGNAPS	
0818	REF	5	LAST	1491	20,3727	7 0130 1	MP	1/ACCSIT +1	ANETNEG(PCS)/ACCASTPOS(NFC) AT 2(6)
A0819									
A0820									THE FOLLOWING CODING IS VALID FOR BOTH PCS OF NEG
									VALUES OF ADS
0821	REF	42	LAST	1494	20,373	5 4743 0	DC1/NET+	AD	BIT9
0822	REF	8	LAST	1494	20,3731	56 157 1	XCH	ANET	1 + ANET/ACCAST AT 2(6)
0823					20,3732	0 0006 1	EXTEND		SAVE AND PICK UP ANET
0824	REF	2	LAST	1490	20,3733	22 161 1	QXCH	ARET	SAVE RETURN
0825	REF	4	LAST	1489	20,3734	0 3704 1	TC	INVERT	
0826	REF	6	LAST	1491	20,3735	54 160 1	TS	1/ANET	1/ANET AT 2(7)/PI
0827	REF	43	LAST	1494	20,3736	4 4743 1	CS	BIT9	-1 AT 2(6)
0828					20,3737	0 0006 1	DCACCFUN	EXTEND	
0829	REF	7	LAST	1494	20,3740	7 0160 1	MP	1/ANET	-1/ANET AT 2(13)/PI
0830					20,3741	0 0006 1	EXTEND		
0831	REF	9	LAST	1494	20,3742	10 157 0	DV	ANET	ACCFUN AT 2(7)/PI
0832	REF	3	LAST	1494	20,3743	0 0161 1	TC	APFT	RETURN
0833	REF	5	LAST	1494	20,3744	4 3770 0	NETNEG	CS	-0.3R/S2
0834	REF	10	LAST	1494	20,3745	54 157 0	TS	ANET	ANET LESS THAN AMIN - SET EQUAL TO AMIN
0835	REF	2	LAST	1491	20,3746	1 3725 0	TCF	1/NETMIN +1	CONTINUE AS IF NOTHING HAPPENED

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0836	REF	12	LAST	1491	20,3747	10 162 1	FIXMIN	CCS	SIGNALS	
0837	REF	11	LAST	1479	20,3750	3 4752 0		CA	TWO	IF ACS NEG, ACCSW = +1
0838	REF	15	LAST	1462	20,3751	6 7752 0		AD	NEGONE	IF ACS POS, ACCSW = -1
0839	REF	4	LAST	1494	20,3752	54 122 1		TS	ACCSW	
0840	REF	7	LAST	1492	20,3753	6 0154 1		AD	UV	IF ACCSW = +1, TEST FOR +U (+V) JET FAIL
0841	REF	538	LAST	1491	20,3754	50 000 0		INDEX	A	IF ACCSW = -1, TEST FOR -U (-V) JET FAIL
0842	REF	2	LAST	1491	20,3755	3 3774 0		CA	-UMASK +1	
0843	REF	11	LAST	1492	20,3756	7 1257 1		MASK	CH5MASK	
0844					20,3757	0 0706 1		EXTEND		
0845					20,3760	1 3764 0		BZF	+4	
0846	REF	6	LAST	1494	20,3761	4 3770 0		CS	-03R/S2	JET FAILURE - CANNOT USE 2-JET VALLES
0847	REF	11	LAST	1494	20,3762	54 157 0		TS	ANET	ANET = AMIN
0848	REF	1			20,3763	1 3532 1		TCF	STMIN- -1	CALCULATE FUNCTIONS USING AMIN
0849	REF	215	LAST	1491	20,3764	3 0001 0		CA	L	L HAS ACCFUN
0850	REF	2	LAST	1495	20,3765	1 3533 0		TCF	STMIN-	STORE MAX VALUES FOR MIN JETS

A0851

ERASABLE ASSIGNMENTS FOR 1/ACCNT

0852	REF	5	LAST	135	F6,1551		1/ANETP	EQUALS	BLOCKTOP +2
0853	REF	6	LAST	1495	F6,1553		1/ACOSTR	EQUALS	BLOCKTOP +4
0854	REF	7	LAST	1495	F6,1557		PACCFUN	EQUALS	BLOCKTOP +80
0855	REF	8	LAST	1495	F6,1561		PER1	EQUALS	BLOCKTOP +100
0856	REF	9	LAST	1495	F6,1562		RCE2	EQUALS	BLOCKTOP +110
0857	REF	11	LAST	1495	F6,1563		RDB4	EQUALS	BLOCKTOP +120
0858	REF	11	LAST	1495	F6,1564		PCB3	EQUALS	BLOCKTOP +130
0859	REF	12	LAST	1495	F6,1565		PACDIST	EQUALS	BLOCKTOP +140

0860 REF 71 LAST 1254 122

ACCSW EQUALS VBUF

EXECUTIVE TEMPORARIES
CANNOT DO CCS NEWJOB DURING 1/ACCS
TEMP BUFFER FOR U AND V AXES

A0861							1/ATEM1	EQUALS	ACCSW +1
0862	REF	5	LAST	1495	0123		1/ATEM2	EQUALS	1/ATEM1 +1
0863	REF	7	LAST	1492	0124		1/ACOSTT	EQUALS	1/ATEM1 +4
0864	REF	8	LAST	1495	0127		Z1TEM	EQUALS	1/ATEM1 +6
0865	REF	9	LAST	1495	0131		Z2TEM	EQUALS	1/ATEM1 +7
0866	REF	10	LAST	1495	0132				

0867	REF	11	LAST	1495	0135		UCP1	EQUALS	1/ATEM1 +100
0868	REF	12	LAST	1495	0136		UCB2	EQUALS	1/ATEM1 +110
0869	REF	13	LAST	1495	0137		UCB4	EQUALS	1/ATEM1 +120
0870	REF	14	LAST	1495	0140		UCB3	EQUALS	1/ATEM1 +130
0871	REF	15	LAST	1495	0141		UCXDIST	EQUALS	1/ATEM1 +140

U AXIS DEADBAND BUFFER

0872	REF	16	LAST	1495	0143		CEB1	EQUALS	1/ATEM1 +160
0873	REF	17	LAST	1495	0144		CEB2	EQUALS	1/ATEM1 +170
0874	REF	18	LAST	1495	0145		CEB4	EQUALS	1/ATEM1 +180
0875	REF	19	LAST	1495	0146		CEB3	EQUALS	1/ATEM1 +190
0876	REF	20	LAST	1495	0147		AXDSTEM	EQUALS	1/ATEM1 +200

TEMP DEADBAND BUFFER, ALSO V AXIS

0877	REF	21	LAST	1495	0151		FLATEMP	EQUALS	1/ATEM1 +220
0878	REF	22	LAST	1495	0152		Z3TEM	EQUALS	1/ATEM1 +230

MUST FOLLOW FLATEMP

L POSTASK AND ADSJCF

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0879	REF	8	LAST 1485	1343	DEVAL1	EQUALS	DE
0880	REF	5	LAST 1407	0114	DEVAL2	EQUALS	INTB15+
0881	REF	6	LAST 1496	0115	DEVAL3	EQUALS	INTB15+ +1
0882	REF	7	LAST 1496	0116	DRIFTER	EQUALS	INTP15+ +2
0883	REF	920	LAST 1486	0154	LV	EQUALS	MPAC
0884	REF	921	LAST 1496	0157	ANET	EQUALS	MPAC +3
0885	REF	922	LAST 1496	0157	FLATEN	EQUALS	MPAC +3
0886	REF	923	LAST 1496	0160	1/ANET	EQUALS	MPAC +4
0887	REF	924	LAST 1496	0161	ARET	EQUALS	MPAC +5
0888	REF	925	LAST 1496	0162	ARSACS	EQUALS	MPAC +6
0889	REF	926	LAST 1496	0163	SIGNACS	EQUALS	MPAC +7
0890	REF	927	LAST 1496	0164	-SIGNACS	EQUALS	MPAC +8D
0891	REF	928	LAST 1496	0165	HOLD	EQUALS	MPAC +9D
0892	REF	63	LAST 1391	0117	ACCRETRN	EQUALS	FIXLOC -1

0893			20,3766	00110 1	ZCNE3MAX	DEC	.004375
0894			20,3767	00443 1	FLATVAL	DEC	.01778
0895			20,3770	77377 1	-.03R/S2	CCT	77377

17.5 MS (35 MS FOR 1 JET) AT 4 SECONDS
 .8 AT PI/4 RAD
 -PI/2(7) AT PI/2

0896			20,3771	00356 1	.023R/S2	CCT	00356
0897	REF	45	LAST 1491	4733	1/.03	EQUALS	POS MAX

.0228 RAD/SEC(2) AT PI/2
 2(7)/PI AT 2(7)/PI

0898	REF	2	LAST 1403	20,3772	02213 0	PAXISADR	GENADR PAXIS
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AC899

A1500

0901			20,3773	00110 1	-UMASK	CCT	00110
0902			20,3774	00022 1		CCT	00022
0903			20,3775	00204 1	+UMASK	CCT	00204
0904			20,3776	00041 1		CCT	00041

THE FOLLOWING 4 CONSTANTS ARE JET
 FAILURE MASKS AND ARE INDEXED

-U
 -V
 +U
 +V

L SPS BACK-UP PCS CONTROL LSFR'S PAGE NO. 1 FC S4

P0001 PROGRAM NAME: SPSPCS

R0002 AUTHOR: EDGAR M. CSIKI (AC ELECTRONICS)

P0003 MODIFIED: TO RETURN TO ALL AXES VIA G BY P.S. WEISSMAN, OCT 7, 1968

R0002 MODIFIED TO IMPROVE BEADING STABILITY BY G. KALAN, FEB. 14, 1969

R0003 FUNCTIONAL DESCRIPTION:

R0004 THIS PROGRAM CONTROLS THE FIRING OF ALL RCS JETS IN THE DOCKED CONFIGURATION ACCORDING TO THE FOLLOWING PHASE
R0006 PLANE LOGIC.

P0007 1. JET SENSE TEST (SPS0CS)

P0008 IF JETS ARE FIRING NEGATIVELY, SET CLODENSE NEGATIVE AND CONTINUE

R0009 IF JETS ARE FIRING POSITIVELY, SET CLODENSE POSITIVE AND CONTINUE

R0010 IF JETS ARE NOT FIRING, SET CLODENSE TO ZERO AND GO TO CUTER RATE LIMIT TEST

P0012 2. RATE DEAD BAND TEST

R0013 IF JETS ARE FIRING NEGATIVELY AND RATE IS GREATER THAN TARGET RATE, LEAVE

R0014 JETS ON AND GO TO INHIBITION LOGIC. OTHERWISE, CONTINUE.

R0015 IF JETS ARE FIRING POSITIVELY AND RATE IS LESS THAN TARGET RATE, LEAVE

R0016 JETS ON AND GO TO INHIBITION LOGIC. OTHERWISE, CONTINUE.

P0017 3. CUTER RATE LIMIT TEST (SPSSTART)

R0018 IF MAGNITUDE OF EDCOT IS GREATER THAN 1.73 DEG/SEC SET JET FIRING TIME

R0019 TO REDUCE RATE AND GO TO INHIBITION LOGIC. OTHERWISE, CONTINUE.

R0020 4. COAST ZONE TEST

R0021 IF STATE (E, EDCOT) IS BELOW LINE $E + 4 \times EDCOT > -1.4 \text{ DEG}$ AND EDCOT IS LESS THAN 1.30 DEG/SEC SET JET TIME POSI-
R0023 TIVE AND CONTINUE. OTHERWISE, SET JET FIRING TIME TO ZERO AND CONTINUE.

R0024 IF STATE IS ABOVE LINE $E + 4 \times EDCOT > +1.4 \text{ DEG}$ AND EDCOT IS GREATER THAN -1.30 DEG/SEC, SET JET TIME NEGATIVE
R0026 AND CONTINUE. OTHERWISE, SET JET FIRING TIME TO ZERO AND CONTINUE.

R0027 5. INHIBITION LOGIC

P0028 IF CLODENSE IS NON-ZERO:

R0029 A) RETURN IF JET TIME HAS SAME SIGN AS CLODENSE

R0030 B) SET INHIBITION COUNTER* AND RETURN IF JET TIME IS ZERO

P0031 C) SET INHIBITION COUNTER, *SET JET TIME TO ZERO AND RETURN IF SIGN
P0032 OF JET TIME IS OPPOSITE TO THAT OF CLODENSE

R0033 IF CLODENSE IS ZERO:

R0034 A) RETURN IF INHIBITION COUNTER IS NOT POSITIVE

P0035 B) SET JET TIME TO ZERO AND RETURN IF INHIBITION COUNTER IS POSITIVE

P0037 *NOTE: INHIBITION COUNTERS CAN BE SET TO 4 OR 10 FOR THE P, AND UV AXES,

R0038 RESPECTIVELY, IN SPSRCS. THEY ARE DECREMENTED BY ONE AT THE BEGINNING OF

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R0039 EACH DAP PASS.

R0040 THE MINIMUM PULSE WIDTH OF THIS CONTROLLER IS DETERMINED BY THE PERPETITION RATE AT WHICH THIS ROUTINE IS CALLED
 R0042 AND IS NOMINALLY 100 MS FOR ALL AXES IN DRIFTING FLIGHT. DURING POWERED FLIGHT THE MINIMUM IS 100 MS FOR THE
 R0044 P AXIS AND 200 MS FOR THE CONTROL OF THE L AND V AXES.

R0045 CALLING SEQUENCE:

R0046 INHINT

R0047 TC IBKCALL
 R0048 CACR SPSRCS

R0049 EXIT:

R0050 TC G
 R0051 ALARM/ABORT MODE: NONE

R0052 SUBROUTINES CALLED: NONE

R0053 INPUT: F, EDCT
 R0054 TJP, TJV, TJU TJ MUST NOT BE NEGATIVE ZERO

R0055 OUTPUT: TJP, TJV, TJU
 R0056

0057
 0058 REF 4 LAST 1476 21,3647 EANK 21
 0059 21,3647 SETLCC DAPS4
 21,3647 BANK

0060 REF 1 COLINT* \$\$/DAPBU

0061 REF 14 LAST 1448 56,1525 EANK= TJU
 0062 21,3647 532 0 RATELIM2 CCT 00632 1.125 DEG/SEC
 0063 REF 20 LAST 1387 21,3651 3 4736 1 PCSTHRST CA HALF

0064 REF 33 LAST 1454 21,3651 51,505 0 NDX AXISCTR
 0065 REF 15 LAST 1458 21,3652 55,525 0 TS TJU
 0066 REF 1 21,3653 11,745 1 CCS QLSFENSE
 0067 REF 1 21,3654 1 3674 0 TCF POSCHECK JETS FIRING POSITIVELY
 0068 REF 1 21,3655 1 3677 0 TCF CTDCHECK JETS OFF. CHECK INHIBITION CTR
 0069 REF 34 LAST 1458 21,3656 51,505 0 NFGCHECK INDEX AXISCTR JETS FIRING NEGATIVELY
 0070 REF 16 LAST 1458 21,3657 4 1525 0 CS TJU

0071 REF 539 LAST 1458 21,3660 10 000 0 CCS A
 0072 REF 433 LAST 1494 21,3661 0 0002 0 TC 0 RETURN

0073 21,3662 1 3664 1 TCF +2
 0074 21,3663 1 3664 1 TCF +1 JETS COMMANDED OFF. SET CTR AND RETURN
 0075 REF 35 LAST 1498 21,3664 51,505 0 SETCTR INDEX AXISCTR JET FIRING REVERSAL COMMANDED. SET CTR,
 0076 REF 1 21,3665 3 2716 0 CA UTIME SET JET TIME TO ZERO, AND RETURN

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0077	REF	36	LAST	1499	21,3666	51'505 0	INDEX	AXISCTR	
0078	REF	3	LAST	1418	21,3667	55'770 1	TS	UJETCTR	
0079	REF	318	LAST	1494	21,3670	3 4755 1	ZAPTJ	ZERO	
0080	REF	27	LAST	1499	21,3671	51'505 0	INDEX	AXISCTR	
0081	REF	17	LAST	1498	21,3672	55'525 0	TS	TJL	
0082	REF	434	LAST	1498	21,3673	0 0002 0	TC	Q	
0083	REF	38	LAST	1499	21,3674	51'505 0	PCSCHECK	INDEX	AXISCTR
0084	REF	18	LAST	1499	21,3675	3 1525 1	CA	TJL	
0085	REF	1			21,3676	1 3660 0	TCF	NEGCHECK +2	
0086	REF	35	LAST	1499	21,3677	51'505 0	CTPCHECK	INDEX	AXISCTR
0087	REF	4	LAST	1499	21,3700	11'770 1	CCS	UJETCTR	CHECK JET INHIBITION COUNTER
0088					21,3701	1 3703 1	TCF	+2	
0089	REF	435	LAST	1499	21,3702	0 0002 0	TC	Q	CTR IS NOT POSITIVE. RETURN
0090	REF	1			21,3703	1 3670 1	TCF	ZAPTJ	CTR IS POSITIVE. INHIBIT FIRING
0091	REF	436	LAST	1499	21,3704	0 0002 0	TC	Q	CTR IS NOT POSITIVE. RETURN
0092					21,3705	00004 0	OCT	00004	
0093					21,3706	00012 1	OCT	00012	
0094					21,3707	00012 1	OCT	00012	
0095	REF	3	LAST	134	56,1745		OLDSENSE	EQUALS	DAPTREG1
0096	REF	181	LAST	1492	21,3710	4 4753 0	NEGFIRES	CS	ONE
0097	REF	2	LAST	1498	21,3711	55'745 1	TS	OLDSENSE	JETS FIRING NEGATIVELY
0098	REF	18	LAST	1499	21,3712	3 1427 1	CA	EDCT	
0099					21,3713	1 3717 1	TCF	+4	
0100	REF	182	LAST	1499	21,3714	3 4753 1	PLUSFIRES	CA	ONE
0101	REF	3	LAST	1499	21,3715	55'745 1	TS	OLDSENSE	
0102	REF	19	LAST	1499	21,3716	4 1427 0	CS	EDCT	RATE LEAD BAND TEST
0103	REF	540	LAST	1498	21,3717	22 000 1	LXCH	A	
0104	REF	64	LAST	1494	21,3720	4 0111 1	CS	DAPPCOLS	IF CPIFTEIT = 1, USE ZERO TARGET RATE
0105	REF	7	LAST	1487	21,3721	7 4744 0	MASK	DRIFTHIT	IF CPIFTEIT = 0, USE 0.10 RATE TARGET
0106	REF	541	LAST	1499	21,3722	10 000 0	CCS	A	
0107	REF	1			21,3723	3 4767 0	CA	PATECEL	
0108	REF	316	LAST	1495	21,3724	6 0001 0	AD	L	
0109					21,3725	0 0006 1	EXTEND		
0110	REF	1			21,3726	6 3736 0	BZMF	SFSSTART	
0111	REF	1			21,3727	1 3653 0	TCF	PCSTHPST +2	
0112	REF	40	LAST	1499	21,3730	51'505 0	SFSFCS	INDEX	AXISCTR
0113	REF	19	LAST	1499	21,3731	11'525 0	CCS	TJL	JET SENSE TEST
0114	REF	1			21,3732	1 3714 1	TCF	PLUSFIRES	JETS FIRING POSITIVELY
0115					21,3733	1 3735 1	TCF	+2	
0116	REF	1			21,3734	1 3710 0	TCF	NEGFIRES	JETS FIRING NEGATIVELY
0117	REF	4	LAST	1499	21,3735	55'745 1	TS	OLDSENSE	JETS OFF
0118	REF	20	LAST	1499	21,3736	3 1427 1	SFSSTART	CA	EDCT
0119					21,3737	0 0116 1	EXTEND		CUTER RATE LIMIT TEST
0120	REF	1			21,3740	7 4766 0	MP	RATELIM1	
0121	REF	542	LAST	1499	21,3741	10 000 0	CCS	A	
0122	REF	1			21,3742	1 3761 0	TCF	NEGTHRST	CUTER RATE LIMIT EXCEEDED
0123					21,3743	1 3745 0	TCF	+2	
0124	REF	2	LAST	1499	21,3744	1 3651 0	TCF	PCSTHRST	CUTER RATE LIMIT EXCEEDED
0125	REF	21	LAST	1499	21,3745	3 1427 1	CA	EDCT	COAST ZONE TEST

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0126	REF	17	LAST	1459	21,3746	6	1752	0	AD	F	
0127					21,3747	0	0006	1	EXTEND		
0128	REF	2	LAST	214	21,3750	7	1411	0	MP	DKDB	PAC LOADED DEADBAND. FRESHSTART: 1.4 DEG
0129					21,3751	1	0006	1	EXTEND		
0130	REF	1			21,3752	1	3767	0	BZF	TJZERO	
0131					21,3753	6	0006	1	EXTEND		
0132					21,3754	6	3763	0	BZMF	+7	
0133	REF	22	LAST	1495	21,3755	3	1427	1	CA	ECOT	
0134	REF	1			21,3756	6	3647	1	AD	RATELIM2	
0135					21,3757	0	0006	1	EXTEND		
0136	REF	2	LAST	1500	21,3760	6	3767	1	BZMF	TJZERO	
0137	REF	31	LAST	1498	21,3761	4	4736	0	NEGTHRST	CS	HALF
0138	REF	2	LAST	1495	21,3762	1	3651	1	TCF	POSTHRST +1	
0139	REF	2	LAST	1500	21,3763	4	3647	0	+7	CS	RATELIM2
0140	REF	23	LAST	1500	21,3764	6	1427	1	AD	ECOT	
0141					21,3765	0	0006	1	EXTEND		
0142	REF	4	LAST	1500	21,3766	6	3650	1	BZMF	POSTHRST	
0143	REF	319	LAST	1499	21,3767	3	4755	1	TJZERO	CA	ZERO
0144	REF	5	LAST	1500	21,3770	1	3651	1	TCF	POSTHRST +1	
0145	REF	5	LAST	1417	4766				RATELIM1 =	CALCODE	= 00022, CORRESPONDING TO 1.73 DEG/SEC
0146	REF	1			4767				RATELIM1 =	TBUILDEX	= 00045, CORRESPONDS TO 0.101 DEG/SEC

*** END OF LMDAF .023 ***

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
.00375A8	17,3771	1459	1 1455	-.1875	20,2223	1486	1 1485	-TJMIN	17,3775	1455	1 1457
.023F/S2	20,3771	1456	1 1450	-.7071	20,3107	1484	2 1479 1485	-TFFP	F4,1542	=	116 6 307 721
.0375A4	17,3764	1459	1 1457	-.AYD	83,1712	112	1 1129	-LMASK	20,3773	1456	2 1491 1495
.1AT2	17,3763	1459	1 1457	-.AZ	11,2357	815		-UP	00,2620	1055	1 1054
.1AT4	17,3762	1459	1 1455	-.AZBIT	4746	=	816 1 815	-XMIN	16,3062	1421	1 1421
.166...	23,3537	1247	1 1243	-.BIT10	06,3004	182	1 178	-XTRANS	17,2201	1433	1 1433
.3D	12,3761	1237	1 1209	-.BIT12	7744	=	530 1 530	-.0.3D/S	01,2344	257	1 295
.55FC	4774	1088	3 514 1325	-.BIT14	7741	1050	2 1413	-.C.6C/S	01,2343	257	1 295
.55FCR17	33,2176	601	1 601	-.CCSPR	01,3123	1105	1 1107	-.1/12	12,3736	1238	1 1228
.7071	20,3106	1484	2 1478 1485	-.CCMAX	07,3737	1321	2 1303 1304	-.1/2+2	00,2444	1051	1 1071
=====				-.CCMAX-	07,3740	1321	2 1303 1304	-.1/E	7744	1050	3 530 1458
(AT)A	27,2016	39	1 833	-.CCSB	85,1644	=	124 1 124	-.CHK	42,3314	1277	5 1278 1283
(TBUP)A	27,2020	39	1 833	-.DFG103	31,3726	=	821 1 820	-.LOOMS	16,3621	1431	2 1460
(TGC)A	32,3757	830	1 831	-.DFLGR	F6,1675	=	137 18 907 911	-.LOOMST6	16,3735	1461	3 1460
(1/DV)A	27,2012	39	1 833	-.DTSCALF	17,2054	564	1 564	-.126MST6	16,3576	1430	2 1427 1430
=====				-.EL	11,2371	815		-.15DEGS	16,2513	171	1 170
+AZ	11,2364	815		-.ELBIT	4752	=	816 1 815	-.15OMS	17,3127	1446	1 1443
+AZBIT	4747	=	816 1 815	-.ELR	05,3357	224	1 219	-.16OMST6	16,3523	1425	1 1425
+DECSGA	4,2313	402	1 401	-.ENCERAS	7746	1050	1 997	-.2JFTLIM	86,1475	131	4 131 1477
+DFC95	31,3730	821	1 82	-.FACVAC	6254	1001	2 997 1015	-.2SEC	10,3571	1272	1 1255
+DOWN	00,2610	1055	1 1054	-.FESTLEN	0155	=	1486 5 1478 1479	-.3CEE	17,3760	1459	1 1452
+EL	11,2376	815		-.FPSMAX	20,3110	1484	4 1478 1479	-.45DEGSR	7743	=	534 1 533
+ELBIT	4752	=	815 1 815	-.FQLRDEG	16,3534	1429	1 1429	-.50DFCSP	25,2242	534	1 524
+LIMIT	42,3337	424	1 424	-.FQLRDT	27,2534	765	1 764	-.50SC	04,3034	1177	1 1166
+MGA	F4,1652	=	118 5 315 692	-.GYRCMIN	07,3512	1313	2 1313 1316	-.7CDEGS	06,2512	171	1 170
+ON	40,2413	403	2 402 443	-.LCKCNFG	23,2040	271		-.80DFCSR	25,2243	534	1 524
+QMIN	17,2314	1435	1 1434	-.MAXACRS	4250	=	1276 1 1281	=====			
+RMIN	17,2314	1435	1 1435	-.YLCF	32,2031	44	1 873	/AF/CNST	31,2345	790	1 786
+TJMIN6	17,3126	1445	4 1436 1444	-.MUTMLN	23,2025	44	1 876	/AF/C	87,1463	=	141 6 141 813
+UMASK	2,3775	1496	1 1491	-.MUCT1	23,2032	44		/RLF+	00,2721	1055	2 1058
+XMIN	16,3064	1421	1 1421	-.CC110	6225	1000	1 1000	/RUF-	00,2715	1058	2 1058
+XCRULCE	17,2211	1433	2 1432 1433	-.CCT620	16,2215	1413	1 1412	/LAND/	F4,1732	=	121 11 120 876
+15OMST6	16,3616	1431	1 1427	-.CA	40,2433	404	2 402 443	/MFAC+	00,2767	1060	2 1060
=====				-.PHASE1	0751	100	6 215 1291	/MFAC-	00,2763	1060	2 1060
*ENTER	36,3050	738	1 738	-.PHASE2	0753	100	8 214 867	/NCRM	00,2732	1059	1 1059
NRBSM	23,3675	1253	6 552 960	-.PHASE3	0755	101	4 215 860	/NCRM2	00,2725	1059	1 1059
*PROCEED	36,3045	738	1 738	-.PHASE4	0757	101	9 215 1373	/R/MAG	F4,1710	=	120 6 120 846
SMNB	23,3673	1253	7 489 959	-.PHASE5	0761	101	2 215 854	=====			
=====				-.PHASE6	0763	101	5 215 1385	?	6001	=	741
-.0112AP	17,3761	1459	1 1454	-.QMIN	17,2210	1435	1 1434	?CLDSUP	31,2412	752	1 779
-.025A12	17,3765	1459	1 1457	-.RATFCE	F6,1476	=	131 7 131 1437	=====			
-.025A14	17,3766	1459	1 1455	-.RMIN	17,2316	1435	1 1435	A	0000	=	92 542 159 1499
-.03F/S2	20,3770	1496	6 1488 1495	-.RRLIMIT	25,2326	537	2 536	6-FCHK	13,3160	1207	4 1204 1216
-.05A12	17,3767	1455	1 1454	-.SIGNACS	0164	=	140 1488 1494	AAPFC	85,1452	=	122 1 122
-.15AT2	17,3770	1455	1 1454	-.TJMAX	17,3773	1459	2 1455 1456	AAPFG*	85,1462	=	122 1 122

HEALTH KEY: NORMALLY DEFINED UNLESS PLACED AS FOLLOWS:

UN UNDEFINED = DEFINED BY EQUALS J DEFINED BY JCKER OR ERASE ANYWHERE MC MULTIPLY DEFINED
 BD PARTLY DEFINED CD DEFINITION ASSOCIATED WITH CONFLICT XX MISCELLANEOUS TROUBLE

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
ABFLCAT	41,2622		427 1 410	ACCSWV	F6,1550		135 1 1492	ADUPLUFF	04,3476		1381 1 1275
ABDEL V	1245	=	105 7 115 1485	ACCTHRE	20,3467		1490 1 1450	ADUPTMP	04,3475		1381 1 1380
ABCVCCAV	57,1513	=	148 5 148 855	ACCCAD	F5,1512	=	129 2 387 388	ADVAN	01,3215		1108 2 1102 1277
ABLCAC	41,2717		428 1 411	ACC4-2FL	1307	=	87 2 826 831	ADVANCE	34,3016		545 2 625 630
ABORT	5624	=	1374	ACC4CR2X	4741	=	87 2 295 1432	AFCCALC1	31,3164		803 1 810
ABORTALM	21,2121		829 2 829	ACCT+C12	16,3742		1466 2 1418 1470	AFCCALC2	31,3174		803
ABORTCN	21,3060		900 1 900	ACENTRAL	F6,1744	=	133 5 1463 1465	AFCCALC3	31,3210		803 1 803
ABOPTS	32,2000	=	34 2 826 829	ACMCDRIT	4737	=	68	AFCCLEND	31,3216		803 1 803
ABORTS1	15,2000	=	29 1 824	ACMODFLG	0040	=	68 3 458 500	AFCSPFT	32,3513		813 2 813
ABORTYZ	16,2771		1420 1 1420	ACCS=0	00,3637		1076 4 1076 1078	AFCUMP	31,2151		786
ABORT2	5644		1373 1 1373	ACCSABRT	00,3723		1078	AFTPTJ	17,2756		1443 3 1436 1442
ABOUTFNF	15,2146		251 2 251	ACOSOVF	00,3721		1078 1 1076	AFTFLTP	30,3202		906 1 905
ABRFG	F5,1416	=	122 2 122 821	ACCSSFR	00,3714		1078 1 1076	AFTGLID	31,2363		761 1 803
ABRFG*	F5,1426	=	122 2 122 821	ACOSST	00,3625		1076 1 1076	AGAINMM	04,2073		229 1 229
ABRTABLE	36,2114		725 1 830	ACOSST2	00,3642		1076 2 1076	AGSLUFF	E4,1600	=	118 14 118 275
ABRTIGN	36,2535		732 1 725	ACCSZERC	01,3731		1078 1 1076	AGSBUFFE	E4,1615	=	118
ABRTJADR	15,3403		824 1 824	ACQSS	00,3652		1077 1 1078	AGSCISFK	32,2022		208
ABRTJASK	05,3404		824 1 824	ACTCENT	E3,1755		112 2 215 673	AGSEND	32,2122		209 2 209
ABS	00,3226		1068 4 818 1067	ACTIVE	23,2425		697 4 630 697	AGSINIT	32,2005		207 1 275
ABSACS	0162	=	1496 12 1486 1491	ADCGRAV	15,2730		959 1 959	AGSK	E4,1420		114 6 197 209
ABSNDCTP	56,1737	=	132 2 1425 1426	ADCTIIN	21,3554		1473 1 1472	AGSLIST	05,2407	=	154
ABSTJ	F6,1727	=	132 5 1426 1445	ADDPDS	20,2402		613 1 613	AGSRNC1	32,2203		210 2 210
ABTCAIC	12,3752		1193 3 1173 1191	ADDRFSS	F106		596 83 914 1257	AGSRNC2	32,2211		210 2 210
ABTFLGS	12,2700	=	30 1 1374	ADDRWD	0116		96	AGSUPCAT	0001	=	236
ABTKLFAM	05,2653		215 1 825	ADG	F5,1416	=	821 1 803	AGSVACALC	32,2336		208 1 208
ABTRDCT	F5,1566	=	123 2 123 827	ADGTTFF	F5,1426	=	821 1 801	AGSWORD	1321		107 4 209 230
ABVAL	01,3201		1167	ACIAX	E3,1463		111 1 330	AHEACS	6436		1008 1 1008
ABVALABS	01,3176		1067 1 1005	ACIAY	E3,1464		111 1 330	ATG	E7,1457		140 9 200 886
ABVFL	57,1471	=	148 8 148 882	ACIAZ	F3,1465		111 1 331	AIBANK	26,3332		585 2 583 588
ABVFL*	0120	=	123 2 881	ADRPCHN2	5366		1289 1 1289	AJMR	31,2671		842 1 842
ACADN83	36,2767		756 1 751	ACRPUPT	17,2272		1446 1 1448	AINGCTN	37,2217		377 1 377
ACADN85	36,2857	=	756 1 747	ADRS+1	43,3646		1282	AINLA	E5,1434	=	129 33 129
ACCDOTC	56,1507		133 8 133 1460	ADRSKAN	27,2214		744 1 744	AK	E6,1761		138 24 138 1409
ACCDOTR	F6,1511	=	133 4 1466 1486	ACPSCHK	43,3615		1281 2 1281	AK1	E6,1762	=	138 1 1408
ACCFPTLP	04,3271		1328 2 1324	ACRSDIF1	F6,1746	=	134 12 1451 1459	AK2	E6,1763	=	138 1 1408
ACCFPTWD	41,2027		407 2 407	ACRSDIF2	F6,1744	=	134 11 1451 1458	ALARM	5567		1371 51 165 1448
ACCFCTZ1	F6,1575	=	135 1 1456	ADRS1	43,3265		1276 1 291	ALARM/TB	35,2430		624 1 624
ACCFCTZ5	F6,1576	=	135 1 1454	ADR4J4C0	5732		1374 1 1373	ALARMIT	27,2526		764 1 764
ACCHERF	20,3435		1490 1 1490	ACR77770	5731		1374 1 1374	ALARMNGA	30,3743		517 1 507
ACCKFLG	0317	=	68	ACSRAX	F3,1466		111 1 330	ALARM1	5722		1374 1 1078
ACCCMP	11,2524		1221 1 1229	ACSRAY	F3,1467		111 1 330	ALARM2	5571		1371 2 1276 1373
ACCRFTPN	0117	=	1496 2 1476 1494	ACSRZ	F3,1470		111 1 330	ALCGKK	37,2627		366
ACCSCKAY	4751	=	38 3 223 1454	ACSCM	43,3604		1281 2 1281	ALCK	F5,1532	=	129 3 366 387
ACCSK	0122	=	1495 5 1492 1495	ACTIME	25,3146		670 1 670	ALFDR	E4,1422	=	118 1 386
ACCSWU	F6,1547	=	135 2 135 1452	ACLPBEM1	04,3642		1384 2 1380 1381	ALFLT	37,2577		366 1 385

HEALTH KEY: NORMALLY DEFINED UNLESS FLAGGED AS FOLLOWS:

UN UNDEFINED = DEFINED BY EQUALS J DEFINED BY JOKER OR PHASE ANYWHERE MD MULTIPLY DEFINED
 BC BADLY DEFINED CD DEFINITION ASSOCIATED WITH CONFLICT XX MISCELLANEOUS TROUBLE

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
ALFLTS	37,2644	386	1 386	ALT	1123	=	104 6 104 1128	ACTMARK	07,2000	244	3 935 953
ALGCPTEM	21,3134	1463		ALTBITS	F7,1741	=	152 5 152 892	ACTMARK1	07,2000	=	29 2 244 251
ALIGNCCA	37,2311	379	3 379	ALTCALC	22,2131	=	354 1 353	ACTMARK2	04,2000	=	28 2 249 975
ALIGNCPT	15,3214	967	1 967	ALTCCNV	33,2025	=	42 1 871	ACTSTALL	17,2704	1319	3 943 1220
ALILP	37,2667	387	1 387	ALTDSPLY	20,2227	=	1404 1 1403	APCPERI	23,2000	=	32 1 695
ALINEX	26,2067	340		ALTERYZ	16,3002	=	1420 1 1420	APSESBIT	4747	=	79
ALINEZ	26,2112	341	1 340	ALTIM	E5,1530	=	129 2 385	APSESW	0202	=	79 2 1190 1191
ALINTIME	43,2434	276	1 262	ALTIMS	F5,1531	=	129 2 385 386	APSFLAG	0230	=	82 3 766 784
ALK	E5,1446	=	129 6 129 387	ALTM	0760	=	93 1 892	APSFLEIT	4737	=	82 16 214 1477
ALKCG	37,2632	386		ALTOLT	21,2231	=	892 1 891	APSTGES	12,3704	1192	1 695
ALKCG2	37,2635	386	1 386	ALTORATE	F7,1711	=	152 5 152 892	APSTGC	27,2671	768	1 767
ALKLP	37,2676	387	1 387	ALTOLT	21,2160	=	891	APSVEX	33,2000	39	3 751 855
ALLCCAST	20,2205	1399	4 231 754	ALTSAVE	F7,1712	=	152 14 152 893	ARATE	22,2771	365	3 365
ALLDC/CC	41,3015	429	2 427 429	ALTSCALE	0272	=	86	ARCCOS	00,3612	1076	1 1005
ALLJFIS	17,3257	1448	2 1448	ALTSCBIT	4742	=	86 1 877	ARCCMF	21,2167	891	
ALLCFF	37,2536	385	2 384 385	ALTSYST	16,3635	=	1427 2 1427	ARCONV	21,2000	42	1 891
ALLDWTG	E6,1502	=	135 7 1402 1454	ALXXYZ	37,3076	=	390 1 384	ARCONV1	33,2027	42	1 872
ALLRFAD	25,3102	555	1 555	ALXIS	E5,1444	=	129 4 384 390	APCSIN	00,3610	1076	1 1005
ALLSFT	35,3417	677	1 677	AM	E6,1735	=	136 3 353 365	APCTAN	13,2510	1129	5 480 1126
ALLIS	26,3703	596	1 595	AMEMORY	E4,1400	=	114	ARCTANXX	13,2536	1129	2 1129
ALLDEC	42,3573	438	1 436	ANG	E7,1460	=	140 2 574 583	APCTRGSF	30,3607	915	3 913
ALLBITS	11,2401	816	2 814	ANGVED	11,3636	=	1234 1 1233	ARCTRIG	23,3222	1241	9 301 1244
ALM/END	43,2114	263	23 262 258	ANET	0157	=	1456 11 1489 1495	ARET	0161	=	1496 3 1490 1494
ALMCADR	1363	=	108 14 118 1374	ANGLTIME	22,3001	=	365 1 365	ARG+	7270	1028	1 1028
ALMCYCL8	4145	448	14 408 449	ANGTERM	E4,1664	=	120 3 120 804	ARGH1	00,3417	1072	2 1073
ALMACADP	5724	1374		ANGX	E5,1500	=	129 2 388 389	ARGLC	00,3470	1073	1 1073
ALMXT1	35,2045	624	2 644	ANGY	E5,1476	=	129 1 389	ARGZERC	7310	1028	1 1028
ALMXT1A	35,2043	624	1 641	ANGZ	E5,1472	=	129 1 389	ARGZERC2	7305	1028	1 1028
ALCAD	41,2736	428	1 410	ANGICFEK	27,3273	=	844 1 843	ARGSO	5067	1094	1 1094
ALOADED	13,3151	1207	2 1206 1207	ANENRIT	4740	=	85 12 324 595	AROUTSF	40,2740	421	1 418
ALPHA	0010	=	1193 4 1164 1168	ANTENFLG	0267	=	85	ARTHINSF	40,3132	434	1 433
ALPHAM	E4,1467	=	115 14 315 1227	ACG	E7,1461	=	140 7 200 886	ARTINSF	40,3145	435	1 433
ALPHAQ	E6,1424	=	130 6 156 1476	ACRBSFLG	0125	=	74	ARTCA	21,2001	42	1 892
ALPHAR	E6,1425	=	130 5 1399 1476	ACRBSYST	4747	=	74 2 1426 1427	ARTCA2	21,2002	42	1 892
ALPHASB	E4,1600	=	119 4 119 315	ACRBTFLG	0210	=	87 1 735	ARTQLTSF	40,2723	421	2 418 419
ALPHATRY	21,3336	1469		ACRBTTRAN	4742	=	87 2 1433 1435	ARLPT	0010	=	92 13 154 1448
ALPHAV	E4,1431	=	115 35 115 1236	ACSQ	E6,1537	=	134 29 124 1487	ASCALE	13,3732	1228	1 1223
ALRM503	24,3000	512	1 511	ACSQTERM	E6,1545	=	134 7 134 1417	ASCENT	30,2315	828	3 823 837
ALRM514	24,2307	501	1 499	ACSR	E6,1541	=	134 11 732 1487	ASCFLIT	34,2000	=	34 1 836
ALRM525	24,2664	509	1 517	ACSRTEPM	E6,1546	=	134 6 1399 1417	ASCSAVE	E5,1574	=	848 2 848
ALRM526	24,2305	501	1 498	ACSL	E6,1543	=	134 3 1487 1488	ASCSPCT	23,2505	862	
ALRM527	24,3001	512		ACSV	E6,1544	=	134	ASCTERM	30,2730	843	3 843 845
ALRM530	24,3115	513	1 513	ACTAZ	E7,1404	=	139 5 155 951	ASCTERM1	30,2740	843	1 844
ALSIGNAG	7547	1035	5 878 1061	ACTCODE	0734	=	100 12 197 954	ASCTERM2	30,2754	843	1 829
ALSK	37,3103	390	1 387	ACTEL	F7,1412	=	129 1 246	ASCTERM3	30,2755	843	3 843

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UN UNDEFINED
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XX MISCELLANEOUS TROUBLE

NC MULTIPLY DEFINED

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
ASCTERM4	30,2756	= 843	1 836	ATTPRIC	1306	= 106	2 370 1321	AXISGFN2	23,3523	1246	1 1246
ASECXT	55,1573	= 129		ATTSCALE	42,2053	= 283	1 283	AXC	E3,1715	112	1 1139
ASENT	30,2000	= 34	2 39 849	ATTSTEER	17,2710	= 1442	1 1424	AXI	01,2345	1079	1 1004
ASENT1	27,2000	= 33	4 38 849	ATY	E4,1754	= 121	5 121 845	AZ	1244	108	4 108 949
ASENT2	07,2000	= 29	1 844	ALG2	07,3571	1215	1 1314	AZEACH	11,2402	816	2 815
ASENT3	05,2000	= 29	1 845	AUC2	07,3542	1314	1 1315	AZEL	14,3745	949	1 945
ASENT4	14,2000	= 31	1 845	ALPLKCN1	23,2034	271	1 271	AZIDUMMY	E7,1645	= 150	1 150
ASENT5	30,2000	= 34		ALPLKON	23,2000	271	1 269	AZIMUTH	E5,1400	= 128	5 128 388
ASENT6	33,2000	= 34	1 850	AUTOMANV	26,2172	476		AZINCR	E7,1556	= 150	4 150 798
ASENT7	23,2000	= 32		AUTCMRIT	4752	= 86	6 183 608	AZINCR1	E7,1445	= 141	6 141 815
ASENTR	34,2000	= 34	3 834	AUTOMOCE	0201	= 86		AZO	E3,1711	112	1 1138
ASINEX	00,3707	1077	1 1076	ALTRATE1	4753	= 88		AZCNTRAL	E6,1746	= 123	13 1463 1465
ASKYFARM	10,2531	1349	1 1348	ALTRATE2	4752	= 88		=====			
ASTAR	15,3652	962	1 962	AUTR1FLG	0321	= 88		R*RNBB*E*	36,2127	725	1 749
ASTNRIT	4740	= 77	1 730	ALTR2FLG	0320	= 88		BACKHAND	17,2561	1429	1 1429
ASTACLOCK	32,3205	781		AUXFLAC	0147	= 76		BACKP	16,2316	1413	1 1461
ASTINDEX	4362	= 782	1 781	AUXFLBIT	4752	= 76	3 856 857	BADDES	25,2634	548	1 548
ASTNFLAG	0154	= 77	4 729 752	AUCCIR	0024	= 1140	7 1135 1137	BACENC	07,3654	1318	2 567 1317
ASTNRET	32,3211	781	1 738	AUCCXIT	1251	= 105	6 105 751	BADRAD	25,3220	557	5 557 560
ASTARETA	26,3034	738	1 737	AUCCBIT	4747	= 78	6 187 853	BAEROCT	31,3635	819	
ASTCK	26,3431	590	1 588	AUCCFLAG	0163	= 78	2 229 713	BAER2	12,3674	1191	2 1190
ASTREAD	27,3170	772	1 772	AUCCOUT	37,3515	854	1 853	BADX	12,2302	1169	3 1167
ASTPCYSK	10,3520	1362	1 1358	AUCCIT	07,2276	253	1 250	BAILCUT	5624	1372	3 457 1411
ASTROTIM	14,2654	701	1 702	AVEMDRIT	4753	= 81		BAILCUT1	5706	1373	7 244 1367
AT	E4,1662	= 120	7 120 842	AVEMIDS*	0225	= 81	3 321 1213	BALLANGS	26,2272	475	4 341 522
AT/PCS	31,2000	39	1 839	AVERAGES	33,2267	856		BALLEXIT	1237	107	2 479 480
ATAN=GO	13,2543	1129	1 1129	AVERTRA	22,2707	859	1 859	BANKCALL	4616	990	314 208 1476
ATDECAV	26,2012	38	1 834	AVESTAR	07,2241	252	2 252 253	BANKJUMP	4640	590	21 271 1494
ATIGINC	E7,1400	139	3 388 666	AVFTOMD	13,3465	1212	1 859	BANKMASK	4350	= 1091	3 1002 1015
ATMAG	24,3372	836	2 741 830	AVFLAG	0050	= 69	6 632 769	BANKRLPT	0016	= 92	13 156 1411
ATMAGAD	32,3757	830	1 828	AVFLAGA	35,2354	632	4 624 666	BANKSET	0165	= 99	14 592 1362
ATMAGADP	36,3144	741	1 732	AVFLAGP	35,2361	632	4 624 666	BASECIP	E4,1537	= 116	2 704 705
ATOPCSM	13,2662	1201	5 37 1234	AVFLBIT	4747	= 69		BASEOTV	E4,1517	= 116	2 704 705
ATCPLEM	13,2735	1203	4 37 1234	AVGEND	22,3661	858	1 854	BASETFMP	1060	= 234	2 232
ATCPOTH	13,2662	= 37	1 711	AVGEXIT	1251	= 105	7 731 860	BASFTHP	E4,1567	= 116	2 704
ATOPTHIS	13,2735	= 37		AVCLTAC	37,3523	854	1 854	BASETHV	E4,1504	= 116	2 704
ATP	E4,1760	= 121	4 121 845	A**SR*T	23,3677	1252	2 604 1252	BASFTIME	E4,1513	= 116	3 704 705
ATR	E4,1756	= 121	3 121 842	AXC	01,2352	1079	1 1004	BAWLINGS	26,2000	= 33	2 340 479
ATTACHED	42,3157	298	1 262	AXOSTEM	0147	= 1495	4 1492 1493	BE	0006	= 1290	5 1289 1296
ATTACHIT	43,3170	298	1 298	AXISCTR	E6,1505	= 133	40 133 1495	BBANK	0006	= 92	46 154 1371
ATTACDR	1304	106	6 106 1321	AXISDIFF	17,3755	1459	2 1439 1451	BRSERVDL	5733	1374	1 1273
ATTCHK	15,3536	972	1 958	AXISDIST	E6,1605	= 135	8 1453 1493	ECCL	E6,1676	136	12 136 1321
ATTCK2	42,2035	283	2 282 283	AXISGEN	23,3443	1245	4 935 963	BDDV	7606	1036	2 1003 1036
ATTFLAG	0150	= 77	1 971	AXISGFN1	23,3451	1245	1 1245	BECT	26,2010	52	1 1125
ATTFLBIT	4753	= 77	3 968 972	AXISGFN2	23,3500	1245	1 1246	BDSU	7665	1021	1 1003

HEALTH KEY: NORMALLY DEFINED UNLESS FLAGGED AS FOLLOWS:

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BC BADLY DEFINED CF DEFINITION ASSOCIATED WITH CONFLICT XX MISCELLANEOUS TROUBLE

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
BDFCK	27,2461	764		BIT57+4	30,2524	1362	2 134E	BLOCK1CF	E6,1547	135	12 135 1495
BFE17	14,3011	1177	1 1188	PITS768	06,2777	182	2 165 177	BNKCHK	43,2737	1283	
BFE19	14,3022	= 1177	1 1185	BIT58/7	21,3067	900	1 900	BNKCTN	43,2336	1277	
BFE22	14,3027	= 1177	1 1163	BIT58,9	16,3623	1421	1 1424	BCCLSMSK	20,2114	295	3 293 294
BFCDES	25,2604	547	3 512	543 BIT59+7	43,3061	288	1 288	EOCLSTR	05,3061	219	1 213
BFCDES20	24,3356	602	2 601	602 BIT59,11	5014	= 1422	1 1422	ECCF	37,2755	388	1 388
BFLQW1	10,2247	1291	1 1292	BIT1	4753	1087	71 66 1482	BORTENT	5574	1371	2 1372 1373
BFLQW2	10,2264	1291	2 1291	BIT1H	32,3542	814	1 813	ECTFAERT	5711	1373	1 1374
BFLQW3	10,2300	1291	1 1291	BIT10	4742	1087	52 66 1477	ECTHAXES	20,3324	1488	1 1492
BFLQW4	10,2302	1291	2 1291	BIT10+15	6021	518	1 518	ECTHJCS	10,2666	1251	1 1251
BESTI	55,1755	= 125	13 125 555	BIT11	4741	1087	33 43 1466	ECTHLITS	25,3604	615	1 615
BESTJ	55,1756	= 125	5 125 933	BIT11+1	25,2403	535	1 535	BOHPAD	22,3377	715	1 715
BETAM	54,1471	= 115	6 115 1236	BIT12	4740	1087	43 65 1489	BOTHSCN	40,2377	403	1 403
BETASE	54,1402	= 119	3 119 315	BIT12,14	7715	= 554	1 553	BOTHSHIP	22,3336	714	1 715
BETAV	54,1437	= 115	11 115 1223	BIT13	4737	1087	60 40 1487	BOVB	01,2460	1082	1 1004
BGIM	16,3741	1466	1 1466	BIT13-14	4355	= 1091	6 282 1400	EPL	01,2504	1083	1 1083
BGIMP3	16,2203	1463	1 1463	BIT14	4736	1087	91 65 1450	EPL/BMA	01,2475	1083	1 1004
BH17	01,2453	1082		BIT14+7	26,2256	477		EPANCF	6726	1017	10 878 1083
BIASCALE	22,3167	368	1 368	BIT14CFM	10,2276	1291	1 1291	EPATE	E6,1725	= 136	2 365 368
BIASFACT	32,3545	814	1 793	BIT15	4735	1087	55 65 1472	BPACHCCN	40,2600	406	1 406
BIASHI	20,2566	1053	1 1072	BIT15+6	7737	1090	1 1350	BRNCHCTF	12,2267	1169	1 1170
BIASLC	20,2270	1466	1 1073	BIT15/14	41,3245	425	2 435 441	EPSECT1	31,2555	795	
BIASRDOT	40,2667	420	1 420	BIT2	4752	1087	54 66 1480	BRSPOT2	31,2662	757	
BIASTEMP	56,1711	= 136		BIT3	4751	1087	42 66 1421	BRSPCT3	31,3037	800	
BIBIBIAS	37,3416	852	1 243	BIT3F	24,3445	827	1 826	BRSPCT4	31,3223	803	
BIGADS	20,2345	1488		BIT4	4750	1087	58 66 1452	BRUPT	0017	= 52	4 824 1448
BIGIC	20,2622	1478	1 1478	BIT4H	20,3015	850		BSLRC	26,2016	52	1 1135
BIGTIME	12,3447	1188	1 1187	BIT5	4747	1087	53 66 1463	BLF	0130	56	165 97 1389
BINCEN	4263	463	4 443 1051	BIT6	4746	1087	67 66 1456	BUF+	00,2422	1050	2 1045 1052
BINFLUNC	40,3142	434	3 423 425	BIT7	4745	1087	43 66 1432	BUF-	00,2416	1049	3 1049 1052
BIN3	6250	= 567	2 558	BIT7+9PV	23,2316	522	1 522	BUFNEG	00,2531	1052	1 1049
BITSET	5720	= 900	1 900	BIT8	4744	1087	45 66 1490	BUFCFM	00,2500	1052	1 1052
BITSOFF	41,2700	428	1 428	BIT8,9	17,3140	1446		BUFPDS	00,2516	1052	2 1049 1052
BITSOFF1	41,2705	428	1 428	BIT9	4743	1087	43 66 1494	BUFZERO	00,2363	1045	1 1052
BIT515+7	10,3523	1362	1 1345	BLANKCHK	10,3132	1356		BUF2	0133	57	25 244 1372
BIT52-10	5011	1089	1 37	BLANKCCN	40,2614	406	2 406 415	BURNBABY	26,2130	725	3 747 833
BIT5384	5741	= 1321	2 1300 1301	BLANKCEX	4752	= 738	1 727	EUSYMASK	10,3530	1362	
BIT54+10	10,3526	1362	1 1361	BLANKCSP	41,2524	455	2 455	BUTTONS	05,2701	216	
BIT5485	4763	1089	3 166 282	BLANKET	5464	1344	9 271 1263	BVECTOR	E7,1524	= 146	24 146 1142
BIT5486	4771	= 1321	5 212 1300	BLANKRET	0114	= 56		BVECTR	0032	= 1140	5 1136
BIT54-5	17,3736	1321	1 1306	BLANKSUB	4255	458	2 441 1356	BVSL	7041	1020	1 1003
BIT54-7	33,3113	876	1 870	BLANKBENK	4302	458	1 458	BYLMATT	15,3530	572	2 568 565
BIT55+11	10,3525	1362	3 1354 1361	BLNKSRL1	40,3550	458	2 458	BZE/GCTC	01,2470	1083	1 1004
BIT55,8	25,3402	560	2 560	BLNKWAIT	36,3351	745	1 750	B1+SOFF	43,2355	272	3 272
BIT5615	06,3003	182	1 181	BLQAC	41,2747	429	1 410	B12-1	4256	= 463	

HEALTH KEY: NORMALLY DEFINED UNLESS FLAGGED AS FOLLOWS:

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MD MULTIPLE DEFINED

XX MISCELLANEOUS TROUBLE

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
B12T14	7725	= 1091	1 1006	CALL	6643	1015	1 1083	CDUSPCTX	0771	= 101	3 867 904
B14+R2	25,2645	548	1 543	CALL/ITA	01,2510	1083	1 1004	CDUSPCTY	0765	= 101	3 867 904
B21/2	13,2504	1128	1 1130	CALLACCS	20,2134	1397	1 1398	CDUSPCTZ	0767	= 101	3 867 904
B2FR	15,3162	964	1 964	CALLCCDE	4766	1088	5 280 1500	CDUT	0735	= 92	12 188 609
B2XSC	13,2502	1128	1 1128	CALLCCGF	26,2643	595	4 518 596	CDLTCMD	0053	= 92	2 538 900
B3TOR4	11,2577	1086	2 1085 1086	CALLGMRL	4747	= 1402	3 1418 1473	CDUTEMFX	1154	104	3 865 886
B5CFF	5563	1370	14 272 717	CALLQERR	17,2124	1432	1 1431	CDUTEMFY	1155	104	3 865 886
B5TOP8	11,2466	1082		CALLRECT	11,3370	1229	4 1229	CDUTEMPZ	1156	104	2 865 867
=====											
C**M**A1	23,3655	1252	2 1252 1253	CALLRTRP	13,2364	1125	1 1125	CDLTIMEF	E5,1436	= 128	
C**M**A2	23,3657	1252	1 1252	CALLT-35	36,2213	726	1 726	CDLTIMEI	E5,1434	= 128	
C**M**A3	23,3670	1252	2 1252 1253	CALCGP	14,3232	940	1 940	CDUTOCOM	22,2410	358	3 352 483
CALCFCE	07,3132	1304	1 171	CALCGP1	14,3260	940	2 940	CDLTRIG	23,3541	1249	11 489 973
CADFFLSH	0372	100	6 196 1360	CALSAN	15,2536	955		CDUTRIGS	23,3551	1249	3 1249 1252
CADFMARK	1373	100		CALSAM1	15,2535	955	1 954	CDUWXP	30,3426	511	1 511
CADRMASK	10,3531	1362	1 1353	CAL53A	14,3321	940	1 923	CDLX	0032	= 92	29 189 1428
CADSTOR	1041	102	13 223 1358	CAN	E6,1733	= 136	4 136 354	CDLXCMD	0050	= 92	5 175 1405
CADPTAR	11,2001	= 235	1 1296	CANTRD	04,2065	228	1 228	CDLXC	F6,1635	= 135	26 125 1440
CAGFSUP	06,2735	181	1 165	CANV37	04,2132	229	1 229	CDLY	0033	= 92	14 254 1441
CAGFSUB1	06,2743	181	1 175	CANVCG	14,2346	51	12 531 954	CDLYCMD	0051	= 92	2 175 1408
CAGFSUB2	06,2746	181	1 167	CALL	6631	1015	1 1003	CDLYD	E6,1636	= 135	8 370 1441
CAGETEST	07,3623	1317	7 1317 1314	COSCHLE	5675	1373	23 377 1456	CDLZ	0024	= 92	17 170 1441
CAGETSTJ	07,3645	1317	5 1317 1309	COSL	7666	1038	1 1091	CDLZCMD	0052	= 92	2 176 1408
CAGETSTG	07,3640	1317	3 1317 1308	CD*TR*G	23,3545	1249	1 480	CDLZD	E6,1637	= 135	7 370 1441
CALCFIF	55,1460	= 128		CD*TR*GS	23,3557	1250	3 1249 1252	CDLZDIM	30,3760	918	1 907
CALCGA	23,3355	1243	4 375 966	CD*TR*G2	0016	= 1258		CEARTH	0016	= 929	3 928 932
CALCGA1	23,3415	1243	1 1244	CD*TR*G3	4735	= 85	2 593	CENTANG	E7,1620	142	6 195 662
CALCGRAV	33,2667	873	2 862 874	CD*TR*G4	0264	= 85	2 271 512	CG	E5,1574	= 123	16 123 848
CALCGRV1	33,2724	873	1 873	CD*TR*G5	34,3133	650	2 630 640	CGCALC	31,3240	804	2 791 804
CALCGTA	23,3251	1239	4 927 563	CD*TR*G6	06,2012	157		CGCTD	6706	1016	1 1003
CALCMAN2	0053	= 70	2 365 366	CD*TR*G7	23,2663	1252	5 705 974	CHAN	E5,1443	= 128	
CALCMAN3	0052	= 60	1 365	CD*TR*G8	23,3650	1252	3 520 950	CHANDSP	41,2506	417	1 416
CALCANB2	36,3466	751	1 756	CD*TR*G9	E5,1543	= 128		CHANGEVB	07,2611	260	1 260
CALCANB5	36,3402	750	1 724	CD*TR*G10	E5,1440	= 128		CHANCI	5122	1095	4 375 1282
CALCPEPR	16,3452	1428	2 1403 1428	CD*TR*G11	E5,1461	= 128		CHANG2	5126	1095	1 995
CALCPI1	22,2701	363	1 363	CD*TR*G12	10,2661	1388		CHANJCB	01,2707	1100	4 1095 1107
CALCPGV3	31,2763	799	2 791 792	CD*TR*G13	E3,1474	= 111	21 167 1314	CHANLEAD	41,3165	432	1 432
CALCRV6	33,2735	873	1 854	CD*TR*G14	E5,1443	= 128		CHAN12	0012	= 93	74 166 1480
CALCSMSC	11,2031	1255	7 921 973	CD*TR*G15	10,3577	1387	15 249 1250	CHAN13	0013	= 93	24 213 1447
CALCTFF	27,3470	1267	1 721	CD*TR*G16	E5,1536	= 128		CHAN14	0014	= 93	23 175 1409
CALCTHET	27,2255	758		CD*TR*G17	E5,1441	= 128		CHAN30	0030	= 93	5 162 1400
CALCTHFP	27,3465	1267	1 721	CD*TR*G18	E5,1442	= 128		CHAN31	0031	= 93	21 282 1424
CALCOXY	26,3623	595	1 593	CD*TR*G19	E5,1442	= 128		CHAN32	0032	= 93	3 195 857
CALC2FIT	4752	= 71		CD*TR*G20	0036	= 92	4 197 529	CHAN33	0033	= 93	23 168 885
CALC3FIT	4751	= 70		CD*TR*G21	0054	= 92		CHAN5	0005	= 93	6 213 1440
				CD*TR*G22	0765	101	33 101 1251	CHAN6	0006	= 93	3 213 1403

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SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES		
CHAR	0117	=	96	5 399	401 CHKTEMX	37,3636	866	1 866	CNTABTAD	21,2101	824	1 824	
CHAPALEM	40,3470	448	18 399	451 CHKVISFZ	16,2740	1419	1 1418	CNTCHK	07,2235	252			
CHASTIN	40,2077	399	1 1323	CHAL12	0066	=	1466	3 1466	CNTINDEX	4762	=	727	
CHAPIN2	40,2112	399	2 399	CHRRPIC	4355	463	7 159	1382 CNTRCHK	43,2507	1279	5 725	740	
CHECKALT	30,2763	844	1 843	CH31TFMP	E6,1442	131	2 1422	1436 CNTRCCN	4771	=	1276	1 1279	
CHECKR	7753	1292	1 1289	CH5MASK	1257	105	11 191	1495 CNTRLCOP	43,2510	1279	1 1280		
CHECKCTR	12,2644	1175	2 1169	1187 CH6MASK	1260	105	6 192	1430 CCAALIGN	37,2301	379	1 277		
CHECKC	37,2332	379	2 376	377 CIRCL	34,2372	639	2 638	CCAPFINE	14,3352	940			
CHECKG1	27,2335	379	1 380	CIPOLLAR	12,3670	1191	1 1190	COARS	07,3002	1302	1 1302		
CHECKIN	17,2300	1435	1 1434	CKIMUSE	5244	1113		CCARSE	14,3557	945	5 940	966	
CHECKMAX	22,2117	353	1 353	CKMCMORE	43,2761	=	1278	CCARSERR	07,2102	1304	2 1303		
CHFKMM	5321	1284	6 727	826 CKMT02	13,3631	1215	1 1233	CCARSRET	15,2161	923	1 941		
CHECKKAJ	43,3353	1277	3 1277	1282 CKMDDCAD	43,2430	275	3 265	274 CCARSTCL	07,3111	1304	1 1304		
CHECKKP	16,3054	1421	1 1421	CKSTALL	32,2105	209	1 209	CCARSTYP	15,2171	924	1 923		
CHECKRR	43,2714	281	1 281	CK4V32	04,3467	1381	3 1380	CCARS1	07,3007	1302	1 1312		
CHECKTAB	04,2172	228	1 226	CLEANDSP	10,2457	1347	2 727	73E CCARS2	07,3032	1303	2 1303	1304	
CHECKCLP	16,2041	1401	1 1401	CLEANFNC	10,3234	1357	1 1355	COASCODE	07,2137	247	1 246		
CHECKYAW	07,2667	845	2 844	CLFAR	40,2467	405	1 400	CCASTE	E6,1603	=	135	7 1453	1493
CHEKX15	27,2137	484	1 484	CLFARMFK	5474	1244	2 226	1344 CCASTSET	36,3612	754	1 753		
CHEKX17S	16,2000	1400	2 1401	1411 CLEARI	40,2522	405	1 405	COASTTJ	17,3455	1453	4 1453	1459	
CHEKMCFF	16,2016	1400	1 1410	CLOAD	41,2164	429	1 410	CCATRIH	15,3237	966	1 963		
CHEKSTIK	17,2354	1436	1 1434	CLOCKCCN	10,3544	1363	1 1348	CDB	0040	=	1140	4 1135	1136
CHEXFO	22,2537	575	1 574	CLCCPLAY	10,2474	1348	2 737	738 CCEE	0124	=	96	15 400	455
CHKBIT10	17,2237	1434		CLOG2/32	30,3067	851	1 851	CCEE1TCE	07,2123	246	1 246		
CHKRMAG	30,2541	841	1 841	CLOCKJC8	36,2743	737	1 726	CCEE500	32,3255	762	1 762		
CHKCCRS	07,3165	1303	1 1304	CLPKTASK	36,2723	736	4 243	736 CCEE7	07,2107	246	2 246		
CHKDATA1	20,2014	294	1 294	CLOSEADR	21,3621	1474	1 1474	CCEFCIR	0160	=	1486	7 1484	1485
CHKFA1L1	5603	1371	1 1373	CLOSECUT	17,3270	1448	4 1444	1474 CCEFF	20,3217	1486	4 1484	1485	
CHKFA1L2	5610	1371	1 1371	CLPASH1	40,2505	405	1 405	CCEFFG	E6,1627	135	7 135	1485	
CHKING1S	17,2641	1440	1 1440	CLPASS	1014	102	13 223	456 CCEFFR	E6,1630	=	135	6 1447	1485
CHKLASTY	21,2634	897	1 897	CLRAMCD	6011	518	10 230	831 CCF	E6,1670	=	136	45 252	465
CHKLINLS	26,2205	476	2 476	CLPMQCN	13,2712	1202	2 1203	1230 CCFMAXGC	22,2176	354			
CHKLIST	05,3524	964		CIRCVELW	13,2512	1129	1 1129	CDFSKEW	E6,1725	=	136	9 136	356
CHKVINTJ	17,3656	1457	2 1455	1458 CLRXFLAG	30,2722	E43	1 844	CCGA	E5,1765	=	126	16 126	1190
CHKNOVAC	01,3640	1295	1 1298	CLRS	40,2525	405	1 405	CCGAFB1T	4750	=	80		
CHKPOCH	43,2117	264	6 282	469 CLUPDATE	35,3573	681	1 680	CCGAFLAG	0203	=	80	3 1178	
CHKPPIC	10,2430	1346	1 1345	CLUPLCK	04,2342	1329	1 1329	CCGAMAX	0016	=	1194	4 1185	1189
CHKPTMR	16,2672	1418	4 1418	1419 CL1/NFT+	20,3466	1490		CCGAMIN	0010	=	1154	3 1166	1188
CHKSPR	14,3253	939		CMNTGVEL	12,2315	1170	1 1170	CCGACVEL	12,2764	1178	2 1178	1190	
CHKSR	14,3255	939	1 939	CMJDN	0022	=	929	2 928	929 CCGLOLIT	04,3044	1177	1 1189	
CHKSD	14,3274	939	1 939	CMCCNBIT	4740	=	79	1 214	CCGULIM	04,3042	1177	2 1166	
CHKSDA	14,3315	939	1 939	CMCCNFLG	0173	=	79	9 37	1202 CCLINEAR	04,3142	1180	1 1180	
CHKSDATA	14,3250	939	2 938	944 CMPCNENT	30,2612	E41	1 E40	COLREG	1116	=	104	7 104	1234
CHKSPCH	26,2444	591	1 595	CMPIX1	E5,1445	=	129	2 387	CCNADFS	43,3554	1260	2 1262	
CHKSUFR	43,2667	1282	1 1282	CNGL	22,2400	35E			CNFAIL	36,2575	734	2 242	857

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
CCMFAIL1	36,2614	734	1 737	CON2	10,2312	1252	1 1289	CSI/R	34,2125	636	1 644
CCMFAIL2	36,2627	734	1 737	CON2ADR	5422	1289	1 1289	CSI/R1	34,2165	636	2 641 644
CCMFAIL3	36,2616	734	2 723 725	CCPIFS	10,2736	1252	1 1345	CSI/R2	34,2176	636	1 643
CCMFAIL4	36,2620	734	2 723 724	CCPIES2	10,2737	1252	1 1350	CSI/R22	34,2216	637	1 637
CCMFLAG	5511	1365	2 735 1365	CCPINDEK	0164	= 1363	23 1346 1360	CSI/R23	34,2224	637	1 637
CCMMAND	F3,1471	= 111	6 1255 1304	CCPMPAC	0157	= 1362	3 1358 1361	CSI/R23D	34,2237	637	1 637
CCMMECS	20,2574	1478	1 1478	CCPYCYC	33,2423	862	3 856 863	CSI/R3	34,2230	638	1 638
CCMEX	42,3546	1280	2 1282	CCPYCYCL	33,2275	856	1 872	CSI/CDH	35,2000	= 35	3 624 661
CCMINIT	31,2275	834	2 827 834	CCPYCYC1	33,2551	871	1 869	CSI/CDH1	34,2000	= 34	1 635
CCMMLCT	12,2147	1178	1 1151	CCPYCYC2	33,2632	872		CSI/SCL	34,2737	644	1 643
CCMNCN	36,2404	730	1 724	CCPYNCRM	10,2735	1352	1 1349	CSI/LRM	57,1613	142	5 142 644
CCMNCALM	12,3436	1188	1 1188	CCPYPACS	10,2420	1246	1 1255	CSISTEP	34,2732	643	1 643
CCMNEC	07,2111	1304	1 1303	CCPYTCGC	10,2416	1346	1 1356	CSMCCNIC	13,3067	1205	2 340 552
CCMP	7673	1038	4 1035 1068	CCPFINC	01,2024	1103	2 1099 1103	CSMCKFLC	0305	= 87	
CCMPCHK	26,3561	334	1 333	CCRFUND	01,2637	1099		CSMCOCKD	4737	= 87	11 294 1476
CCMPDISP	37,3240	705	1 707	CCRSCHK2	07,3077	1204	2 1303 1304	CSMINT	24,3274	565	1 565
CCMPLOCK	41,2515	417	1 417	CCRSIT	15,3266	966	1 966	CSMPASS	1327	107	7 294 1484
CCMPMAT	13,2237	710		CCSCDU	0743	= 100	5 100 1251	CSMPREC	13,3044	1205	5 37 726
CCMPMATX	27,2172	483	1 485	CCSCDLX	0747	= 100	6 480 1256	CSMSTCRE	23,2431	697	1 697
CCMPFESN	27,2151	484	1 484	CCSCDUY	0743	= 100	5 480 1256	CSMVEC	43,3071	250	1 263
CCMPNUMP	1167	= 104	10 104 1364	CCSCDLZ	0745	= 100	7 480 1255	CSS	0016	= 532	1 532
CCMPCS	17,3044	1303	1 1303	CCSF	0030	= 1155	4 1150 1151	CSSUN	14,2577	929	1 929
CCMPTST	41,2426	415	6 415 429	CCSI	26,2000	52	2 1136	CSS33	14,2756	932	2 931
CCMPTCC	35,2437	653	1 680	CCSINF	00,3517	1074	2 1005 1250	CSS40	14,2754	932	1 931
CCMPTST1	41,2430	415	1 415	CCSMG	7061	= 1403	2 189 190	CSS5	14,2575	929	2 928 925
CCMPD12	22,2211	355	1 355	CCSPH1/2	0722	= 1238	6 1225 1228	CSTH	55,1731	= 126	5 126 1191
CCMTERM	11,3161	1225	1 1228	CCSPH1E	11,3273	1228	1 1225	CSTH-RHC	55,1735	= 126	4 126 1186
CCMZFC	07,3121	1304	2 1303 1304	CCSTALIN	0000	= 236	3 236	CSTDAY	05,2023	52	1 577
CCNC+S1	42,3262	1276	1 1290	CCSTH	0020	= 125	18 300 1243	CSUN	0020	= 525	1 525
CCNC+S2	43,3263	1276	1 1280	CCSTHET1	55,1570	= 123	2 123 844	CS359+	35,2422	634	
CCNIC5	12,2000	= 25	2 1165 1161	CCSTHET2	55,1572	= 123	2 123 844	CTHETA	0322	= 59	3 370 1405
CCNIC51	04,2000	= 28	4 45 1178	CCS1/2DG	25,3076	554	1 552	CTLIST	0334	= 987	6 584
CCNST	30,2572	841	1 840	CCS15DEG	23,2317	522	1 521	CTRHECK	21,3677	1495	1 1498
CCNTABRT	05,2400	824	1 824	CCS60DEG	23,2521	= 556	2 593	CULTBIT	4745	= 71	
CCNTRL2	01,3666	1296	2 1298	CCTRCLER	F6,1631	135	6 1402 1462	CULTFC	14,2751	932	4 932
CCNTDES1	26,3567	593	1 595	CCUNT	0143	= 97	12 400 447	CULTFLAG	0065	= 71	4 931 932
CCNTDES2	26,3576	593		CCUNTFM	11,2347	815	1 815	CULTRIX	55,1706	= 125	1 932
CCNTINU	43,3637	1282	5 1281 1282	CCUNTPL	F5,1542	= 128		CURSCF	1235	= 953	4 261 952
CCNTMANU	22,3170	368	1 367	CCVCNV	42,3675	490	1 490	CURTAINS	5701	1372	8 535 561
CCNTSEPV	33,2545	870	5 868 882	CCZY4	E7,1666	143	4 686 685	CUTCFF	14,2416	946	4 735 846
CCNLNCR	41,3075	431	1 430	CPH1	0321	= 95	11 341 1406	CUTOFF1	14,2430	847	1 846
CCNV3	42,3623	489		CP51	0323	= 99	5 352 1405	CUTCFF2	34,3454	847	2 847
CCNV4	42,3634	489	1 489	CRFWMANU	43,3032	287	1 262	CVECTR	0010	= 1140	1 1136
CCNV5	42,3636	489	1 489	CRITCCN	40,2315	402	1 401	CYCLSHFT	43,3516	1280	
CON1	5405	1299	1 1297	CSI/A	34,2113	635	1 626	CYL	0022	= 52	24 401 1280

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
CYP	0020	=	92 46 233 1295	DAPTEMP4	F6,1742	=	138 4 132 1437	DDV/8DDV	00,2353	1049	2 819 1036
C1/2	7722	=	1089 1 1094	DAPTEMP5	F6,1743	=	138 5 132 1415	DDVCALL	00,2004	1060	1 1060
C1MP	F6,1723	=	136	DAPTEMP6	F6,1744	=	138 11 132 1460	DEAC	27,2230	744	2 744
C1PP	F6,1721	=	136	DAPTRF61	F6,1745	=	138 3 133 1499	DERIT	5522	1365	3 735 1365
C13BANK	17,2000	=	31 1 563	DAPTRF62	F6,1746	=	138 1 134	DEC-12	12,2016	1093	
C13FSAV	1266	=	105 2 563 544	DAPTRF63	F6,1747	=	138 1 134	DEC-6	12,2015	1093	
C13QSAV	1265	=	105 8 985 1447	DAPTRF64	F6,1750	=	138 10 132 1416	DECRACK	0777	101	18 400 449
C13SLCCP	17,2020	=	563 1 564	DAPTRF65	F6,1751	=	138 5 132 1416	DECCNTR	33,2366	857	1 857
C13STALL	6122	=	564 10 469 1446	DAPTRF66	F6,1752	=	138 7 134 1416	DECDSP	41,2525	417	1 409
C13STALL	17,2022	=	563 1 564	DAPTRF67	F6,1753	=	138 3 160	DECDSP2	41,2577	418	2 418
C2MP	F6,1717	=	136	DAPTRF68	F6,1754	=	138 4 1402 1449	DECEC	40,2265	401	2 401
C2PP	F6,1715	=	136	DAPTRF69	F6,1755	=	555 1 561	DECCN	40,2322	402	1 401
C2SQM	F6,1713	=	136	DAPTRF70	F6,1756	=	561 1 556	DECCOUNT	0117	=	96 27 411 435
C2SQP	F6,1711	=	136	DAPTRF71	F6,1757	=	145 5 145 595	DECRET	16,2710	1418	1 1418
C3/2	7742	=	1090 1 1094	DAPTRF72	F6,1758	=	852 2 852 853	DECRET	0115	=	96 2 431 432
C33JMP	F6,2763	=	182 1 165	DAPTRF73	F6,1759	=	128 13 376 380	DECRGND	40,3315	444	1 442
C33TEST	F6,2274	=	168 6 165 167	DAPTRF74	F6,1760	=	555 1 555	DECRTR	16,2712	1418	1 1418
C5/2	5005	=	1088 1 1094	DAPTRF75	F6,1761	=	518 2 505 918	DECTEM	0122	=	96 3 417
=====	=====	=====	=====	DAPTRF76	F6,1762	=	518 2 509 918	DECTEST	41,2445	416	2 415 416
DACLIMIT	20,2446	=	1409 3 1409	DAPTRF77	F6,1763	=	518 1 505	DECTC81M	40,2232	401	1 401
DACLOCP	20,2410	=	1409 1 1409	DAPTRF78	F6,1764	=	107 8 212 1496	DEC17	4361	=	382 3 374 554
DAC	7100	=	1018 1 1018	DAPTRF79	F6,1765	=	1495 5 1488 1493	DEC227	15,2557	955	2 950 954
DALTRATE	F7,1716	=	152 3 152 851	DAPTRF80	F6,1766	=	1495 3 1488 1492	DEC23	42,2033	276	1 276
DAMPING	17,2374	=	1436 1 1436	DAPTRF81	F6,1767	=	1495 4 1489 1492	DEC27	4764	=	1088
DANZIC	6064	=	995 64 941 1392	DAPTRF82	F6,1768	=	1495 6 1489 1493	DEC29	4765	=	1088
DAPAPLPT	F6,1753	=	138 5 133 1448	DAPTRF83	F6,1769	=	1492 1 1492	DEC45	4772	1088	2 1088 1081
DAPATTER	43,2157	=	266 1 262	DAPTRF84	F6,1770	=	1489 1 1489	DEC51	04,3235	1222	
DAPRITS	05,3466	=	826 1 825	DAPTRF85	F6,1771	=	88 1 1397	DEC58	37,2474	382	1 376
DAPROCLS	1111	=	87 64 213 1499	DAPTRF86	F6,1772	=	88 1 1397	DEC585	37,3055	385	1 377
DAPRCRPT	F6,1755	=	138 2 1418 1448	DAPTRF87	F6,1773	=	88 1 1397	DEC66	31,2433	793	3 788 794
DAPDATA1	20,2004	=	293 1 293	DAPTRF88	F6,1774	=	88 1 1397	DEC70	04,2401	234	1 224
DAPDATA2	01,2236	=	296 3 296	DAPTRF89	F6,1775	=	1496 6 1487 1493	DEFUNCT	21,3231	1464	1 1464
DAPCATAR	01,2303	=	296 1 296	DAPTRF90	F6,1776	=	1496 2 1487 1489	DEC-5	15,2467	953	1 951
DAPDATA1	1340	=	107 10 294 315	DAPTRF91	F6,1777	=	1496 3 1487 1490	DEGCOM	40,2717	420	1 419
DAPCAT2	11,2252	=	296 1 296	DAPTRF92	F6,1778	=	137 1 137	DEGCON1	40,3130	434	1 433
DAPDISP	43,3152	=	293 1 262	DAPTRF93	F6,1779	=	506 1 512	DEGINSF	40,3044	433	2 433
DAPIDLER	16,2024	=	1401 2 223 1403	DAPTRF94	F6,1780	=	363 2 366 485	DEGINSF2	40,3055	433	
DAPLPUPT	F6,1754	=	138	DAPTRF95	F6,1781	=	1194 4 1187 1189	DEGCTSF	40,2615	419	2 416 419
DAPS1	16,2000	=	31 4 140 1465	DAPTRF96	F6,1782	=	1038 2 1038	DEGREE1	14,3403	941	1 940
DAPS2	17,2000	=	31 4 1364 1450	DAPTRF97	F6,1783	=	416 2 415	DEGTAB	40,2727	421	2 420
DAPS3	20,2000	=	31 6 42 1467	DAPTRF98	F6,1784	=	416 2 431 432	DEG30	15,2465	953	2 251 951
DAPS4	21,2000	=	31 4 1462 1498	DAPTRF99	F6,1785	=	780 1 805	DEG355	14,3404	941	1 940
DAPTEMP1	F6,1737	=	138 29 131 1460	DAPTRF100	F6,1786	=	782 1 780	DEC60	15,2471	953	
DAPTEMP2	F6,1740	=	138 12 132 1461	DAPTRF101	F6,1787	=	781 1 780	DEL	F6,1745	=	133 3 1464 1466
DAPTEMP3	F6,1741	=	138 6 132 1461	DAPTRF102	F6,1788	=	1036 1 1003	DELAYFX	5235	1112	1 1111

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SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
DELAYJOB	00,3736	1367	14 209 545	DELVEET3	E4,1765	119	15 195 773	DEXDEX	0142	=	98 7 1249 1254
DELAYLOC	1323	107	6 223 1368	DELVIMU	E7,1622	143	7 317 756	DEXI	0143	=	98 1 1253
DELAYNUM	4752	=	37 1 1367	DELVLVC	E7,1433	140	20 140 705	DEX1	0143	=	98 5 98 1254
DELCLUX	E6,1640	135	6 125 1411	DELVMTC	F7,1575	=	142	DEX2	0144	=	98
DELCLUY	E6,1641	=	135 3 137 1411	DELVDV	F4,1622	117	5 317 710	DFPAT	40,3420	447	
DELCDLZ	E6,1642	=	135 3 137 1411	DELVREF	E7,1526	=	148 5 148 873	DCBF	20,2103	1484	2 1480
DELCCMP	22,2527	360	3 265 484	DELVRPD	E7,1766	=	152 6 152 812	DCBIT5	25,3156	556	2 556 560
DELDCFL	E6,1640	=	137 2 366 370	DELVS	E7,1733	=	152 8 152 895	DCCHECK	25,2425	561	2 558 560
DELDCDU1	E6,1641	=	137 1 375	DELVSAB	E7,1663	=	143 4 143 758	DCCHECK2	25,3346	560	2 561
DELDCDU2	E6,1642	=	137 1 375	DELVSIN	E7,1655	=	142 14 143 758	DCDC?	32,2742	607	
DELDFP	E5,1757	=	126 5 126 1175	DELVSLV	F7,1433	=	140 2 199 620	DGCDCCHK	25,3010	553	1 553
DELDFV	E7,1611	142	15 142 643	DELVTFT	27,2252	758		DICFLAG	0020	=	67
DELFL	E7,1575	=	142 4 667 670	DELVTPE	F4,1747	115	3 195 663	DICFLBIT	4736	=	67 4 218 500
DELFLC	0122	=	661 3 667 670	DELVTPI	F7,1575	142	6 142 663	DIFEQ+0	11,3475	1222	1 1228
DELFLIM	30,3756	=	918 1 911	DELVX	0324	=	99 12 327 866	DIFEQ+1	11,3501	1232	1 1228
DELGNRLE	31,3265	907	1 907	DELVY	0326	=	99 10 330 866	DIFEQ+2	11,2512	1222	1 1228
DELINDEP	1014	=	1195 2 1174 1175	DELVZ	0330	=	99 9 330 866	DIFEQNT	E3,1500	111	25 111 1234
DELLCCP	00,3741	1367	1 1367	DELX	E5,1642	=	126 6 126 1170	DIFEQCOM	11,3655	1234	2 1232
DELLT4	E7,1451	140	7 195 759	DSP	0036	=	1195 1 1174	DIFEQTAB	11,2306	1228	1 1228
DELM	E5,1550	=	129 5 257	DSPRCRIT	22,3657	822	2 793	DIFEQC	11,3401	1225	1 1233
DELMX1	34,2105	635	2 643	DSPREV	E5,1761	=	126 2 126 1174	DIFFALT	E7,1577	142	5 195 651
DELMPL	37,2646	386	1 387	DSPCLCCP	31,3564	818	1 818	DIMCBIT	4753	=	71
DELCK	12,2632	1175	1 1174	DSPCOF+1	0153	=	98	DIMOFLEG	0073	=	71 23 237 1234
DELPEFDR	1274	106	5 363 1428	DSPCCF-1	0151	=	98	DINDX	0063	=	138 6 1405
DELPPDR	1275	106	3 370 1441	DSPCCF-2	0150	=	98	DINDRES	6111	556	2 1010
DELCPFX	E5,1520	=	122 2 122 878	DSPCCF-3	0147	=	98	DISCVLVC	35,2375	633	2 626 648
DELPPDR	1276	106	3 370 1441	DSPCCF-4	0146	=	98	DISGRVER	15,2761	959	1 958
DELOSP	22,3541	=	37	DSPCCF-5	0145	=	98	DISINCAT	21,2315	893	2 891 892
DELT	E5,1644	=	126 3 126 1168	DSPCCF-6	0144	=	98	DISPCFAG	36,2402	730	4 723 725
DELTACSM	E3,1572	112	1 589	DSPCCF-7	0143	=	98	DISPCOMX	31,3451	808	1 808
DELTAF	E7,1664	=	151 6 151 878	DSPCCF-8	0142	=	98	DISPDEX	1162	104	24 145 825
DELTALFM	E3,1644	112	1 539	DSPCCF9	0152	=	98 1 819	DISPDEXIT	31,3437	807	5 792 814
DELTAQ	E7,1546	=	146 8 146 1143	DEPPTR	0141	=	98 3 817 818	DISPGYRC	15,3276	566	1 563
DELTATM	E7,1426	=	140 2 513	DESABLL	21,3655	819	1 817	DISPLACE	41,3072	430	2 430
DELTATCK	04,3603	1383	1 1383	DESASANT	0004	=	236 3 236	DISPLAIE	25,3603	682	2 661 662
DELTAX	E5,1664	=	127 12 127 1148	DESCBTT5	23,2455	816	1 255	DISPLAYS	10,2000	=	29 3 1244 1272
DELTFB	E7,1611	=	142	DESCOUNT	1113	103	4 511 548	DISPNCI	36,3016	738	1 737
DELTFEC	E7,1605	=	142 4 670	DESGLCS	26,3636	595	1 592	DISP5X	37,3113	703	2 703
DELTIME	12,2421	1172	3 1168 1187	DESIGBIT	4742	=	85 9 532 871	DISPRATE	20,2257	1405	1 1405
DELTTAF	E7,1425	139	1 795	DESIGFLG	0271	=	85 1 548	DISPRESI	21,3044	500	2 891 892
DELV	0324	95	5 59 959	DESLOCCP	25,2611	548	5 548 596	DISTEM	0122	=	96 3 415
DELVCOSI	E7,1573	142	16 142 643	DESRET	1112	103	10 103 545	DIVIDER	16,2304	1412	2 1412
DELVCTL	E7,1501	=	148 3 751 752	DSRFRTRN	25,2457	543	1 542	DKALI	16,3445	1427	1 1428
DELVEFT1	E4,1666	117	5 195 637	DSRTRN	25,2463	543	2 543	DKC6	E6,1411	130	2 214 1500
DELVEFT2	E4,1674	117	6 195 652	DETENTCK	16,3071	1422	2 1420 1421	DKKACSN	E6,1405	130	1 214

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
DKCMFCAN	56,1404	130	2 214 1415	DNTMFAST	06,2671	179	1 182	DOSTORE	6365	1006	1 995
DKTRAP	56,1403	130	2 213 1415	DNTMGCTC	0335	= 99	9 99 989	DOSUBLST	05,3664	986	1 985
CLAND	55,1634	= 123	11 123 757	DNTM1	0034	= 93	1 986	DOSWITCH	11,3434	1230	2 1225 1230
CLANDX	55,1634	= 123	1 317	DNTM2	0035	= 93	1 986	DOT	7334	1030	1 1093
CLANDY	55,1636	= 123	1 317	DNACCFLN	20,3737	1494	1 1490	DCTERM	40,3642	460	1 460
CLANDZ	55,1640	= 123	1 317	DCALARM	5155	= 1274		DCTICK	22,3441	716	1 716
CLAYJCB	50,2700	= 28	1 1367	DCALIGN	15,3104	563		DCTINC	6136	57	7 57 1031
CLCAD	6,755	994	1 103 3	DCKCKED	20,3111	1484	1 1477	DCTIXER	11,2425	1080	
CLCAD*	7736	1090	1 903	DCKCTEMP	0157	= 1486	4 1476 1481	DCTPER	22,3622	721	1 721
CLCADCCD	7735	1090	1 1010	DCKCTEST	20,2777	1481	2 1481 1494	DCTRET	0137	57	8 57 1070
CLY2	5212	1111	2 1111 1367	DCCMBASE	27,2144	764	1 707	DCTSUE	7161	1025	3 1031
CMENERBIT	4743	= 74		CCCRS	14,3567	945	1 945	DCTSWFMX	30,3753	918	1 912
CMENFLG	0121	= 74	7 575 1145	CCCSM	23,3236	1149	1 1148	DCTGRUPT	17,2117	1395	1 155
CMDF	7335	1030	1 1069	CCCSM1	23,3241	1145	1 1148	CCCLRLK	40,2575	406	2 405 406
DMP	7106	1023	22 4 1 1256	CCCAT	07,2074	246	1 246	CCVLOAD	6466	1010	1 1077
DMPNSUP	7321	1029	1 810	CCDELVZ	27,3565	865	1 866	CCVLOAD*	6471	1010	1 1097
DMPATEMP	0135	= 97	2 1029	CCDES	25,2646	550	1 548	CCW..	11,3714	1236	2 1225 1234
DMPR	7577	1036	1 1003	CCDESND	25,3073	554	1 554	CCW..1	11,3742	1236	2 1236
DMPSEH	7112	1023	25 1025 1256	CCDLLOAD	6463	1010	1 1007	CCWENT2	10,3555	1364	3 1354 1359
DMPSUB2	7131	1023	1 1023	CCDLFLAG*	6147	598	2 1007 1010	CCWNLG	5516	1365	103 209 1356
DMP1	7575	1036	1 1003	CCDNADR	05,3516	584		CCWNGTS	20,3712	1494	2 1481
DNADRCR	05,3523	984	1 986	CCDNCFAN	05,3564	584		CCWNTFLM	05,2000	= 25	2 194 983
DNADUMP	5,3721	985	1 985	CCDNCTR	05,3610	985	1 984	CCWNTCRK	06,1513	123	7 123 1460
DNADUMF1	05,3706	988	2 285 585	CCDNWNTM	05,3472	583	2 154 155	CC1/NET+	20,3730	1494	2 1490 1491
DNADUMF1	05,3733	989	1 989	CCCEART	05,2472	212	1 215	CP(-22)	27,2760	1273	1 1268
DNADUMF2	05,3735	989	1 989	CCCESTR1	05,2477	212	2 218 219	CP-.01	25,3650	684	2 680
DNEDCCR	0336	= 987	15 583 986	CCINT	12,2026	227	2 237	CPAGREE	7260	1028	
DNEDUMP	43,3062	289	2 262 289	CCINT2	13,2060	237	1 237	CPB-14	26,2414	486	2 483 485
DNINDEX	1332	= 107	4 107 561	CCIT	21,2240	788	1 789	CPBIT14	01,3500	1122	1 1122
DNLADMM1	04,2467	236	1 232	CCLEM	26,2460	579	1 575	CPCAT1	20,2037	294	1 294
DNLADPMC	4755	= 236	1 237	CCNPRC	25,2671	550	1 550	CPDAT3	01,2320	297	1 296
DNLPALT	1326	= 107		CCNEADR	27,3651	866	1 866	CPHALF	23,2521	= 1092	12 354 764
DNLPVFLX	1333	= 107	4 107 157	CCNEYET	21,2420	1470	2 1470	CPINCCM	40,3165	435	1 435
DNLRVFLY	1334	= 107	1 107	CCPAXIS	20,3274	1487	1 1487	CPINCRN	40,3173	435	1 435
DNLRVELZ	1335	= 107	2 107 155	CCPIF	21,2230	787	1 787	CPINSE	40,3150	435	4 432 435
DNLSADR	0333	= 99		CCPROC	40,3644	461	2 460 472	CPINSE2	40,3175	435	1 433
DNLSCCC	0332	99	10 99 1384	CCROTAT	17,2772	1443	2 1443	CPISF4	40,3202	435	1 432
DNPHASF1	05,3507	983	2 223 985	CCPREPCS	25,2140	531	1 188	CP1PAY	05,1522	= 129	2 386
DNPHASF2	05,3515	983	1 986	CCPRCT	25,3027	553	2 553	CP1PAZ	05,1526	= 129	1 386
DNG	0337	= 99	2 107 587	CCRSAMP	25,2023	462	1 462	CPL1	30,3707	916	1 916
DNRANGE	1330	107	7 107 609	CCRSAMP2	25,2027	462		DPL3	20,3710	916	1 916
DNRRODT	1331	= 107	2 107 317	CCRSTART	05,2726	216	1 216	DPL5	30,3711	916	1 916
DNTABLE	05,2441	205	1 984	DOSHIFT	21,3530	1472		DPL7	30,3712	916	1 916
DNTMPLFF	0340	= 100	22 155 989	CCSKIP	17,3037	1444	1 1443	DPL9	30,3713	916	1 916
DNTMFXIT	05,3700	986	6 985 585	CCSSHFT	00,2322	1047	1 1047	CPMCDE	10,3717	1351	1 701

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DPSMAX	4732	1087	3 443 1361	DSLW	40,3432	447	2 447	DSPCFTN	15,3413	968	2 968 969
DPCUT	40,2757	421	3 421	CSMAC	0142	= 97	2 447	DSPOUT	06,2063	158	2 157
DPPQSMAX	22,2531	1092	9 301 7C6	CSMSK	40,3434	447	2 447	DSPCUTSR	06,2024	158	2 158 161
DPSRUPN	E6,1750	= 132		DSPA	41,2367	415	1 409	DSPRND	40,3251	443	1 443
DPSFLITE	20,2526	1477	1 1477	DSPAB	41,2362	415	1 409	DSPRRLOS	40,2000	300	1 300
DPSRHSF	32,2000	40	1 778	DSPABC	41,2355	415	1 409	CSFSCAN	06,2032	158	2 158
DPSVFX	33,2301	39	2 747 827	DSPA9ORT	4227	457	3 457	CSPSFNDR	41,2564	418	1 418
DPTST	41,2261	411	4 411 432	DSPALAPN	40,3454	448	8 409 433	DSPSIGN	40,3234	443	4 443 444
DPTST1	41,2303	412	4 412	DSPB	41,2375	415	1 409	CSPTAB	1022	102	48 157 1371
DPTFPC	12,2006	= 1237	3 931 1229	DSPC	41,2402	415	1 409	DSPTEMX	1050	= 102	8 102 702
DPO	0326	= 933		DSPCAGR	16,2211	1403	1 1403	CSPTM1	1044	102	32 102 968
DPI	0040	= 933		DSPCNT	0775	101	7 158	CSPTM2	1047	102	12 102 382
DPI1/12	15,2465	= 251	1 251	DSPCCN1	41,2373	415	3 415 417	DSPVEN79	07,2627	261	3 256 261
DPI1/2	12,2304	= 1128	5 1128 1140	DSPCCN2	41,2407	415	2 415	DSPWCRET	0144	= 97	3 443
DPI1/20	33,2765	874	1 873	DSPCCN3	41,2415	415	1 415	DSP2BIT	41,3424	446	1 449
DPI1/4	12,3765	1237	3 1191 1237	DSPCCNLT	0776	101	66 159 1328	DSP2DEC	40,3227	444	1 426
DPI1/4TH	23,2513	1092	7 37 1143	DSPCCEND	41,2570	418	4 418 425	DSP5068	43,2337	272	
DPI1/8	07,2622	260	1 253	DSPCCGCT	41,2521	417	1 417	DSP68	43,2320	272	1 272
DPI1MIN	26,2121	342	1 340	DSPCCPLT	41,2541	417	1 418	CSG	00,3174	1067	1 1009
DPI1OUTSF	40,2744	421	1 418	DSPCCWCI	40,3267	442	4 444	CSGSUB	00,3300	1070	5 1067 1075
DP2(-3)	27,3762	1273	1 1270	DSPCC2NR	40,3322	444	3 424 445	CSREL	0141	= 97	4 446 447
DP2(-4)	27,3764	1273	1 1264	DSPDECNR	40,3316	444		CSRUPTM	0073	= 95	5 158
DP2/3	05,3771	1237	3 1218 1237	DSPDECVN	40,3242	445	4 422 460	DSRUPTSW	1310	106	10 156 222
DP2OUTSF	40,2751	421	2 418	DSPDECWD	40,3262	443	4 418 423	CSU	7010	1020	1 1003
DP3OUTSF	40,2753	421	1 418	DSPDELAY	40,3743	703	1 703	CT	E7,1715	= 152	7 152 895
DP9/10	04,3032	1177	4 1169 1175	DSPDFCFC	40,3025	426	1 409	CT/DELT	30,3761	918	1 911
DQUAPTR	12,3765	= 1237	2 1223	DSPFLC	1067	= 1362	3 1355 1356	CT/TAU	22,3121	367	1 366
DRCCT	E4,1736	= 121	4 121 841	DSPFLEM	41,2361	442	1 410	CT/2	E4,1475	= 115	11 115 1234
DREDB	20,3656	1493	1 1493	DSPIN	40,3356	446	5 400 447	CT/2COMP	13,3321	1209	1 1210
DRETRIT	4735	= 68	2 166 1305	DSPINI	40,3403	447	2 446 447	CT/2MAX	13,3410	1210	2 1209 1210
DRTSLR2	06,3502	333	1 337	CSPLAY	06,2047	158	1 158	DT/2MIN	13,3406	1210	1 1210
DRIFT/ON	17,3447	1452	1 1453	CSPLIST	1042	102	6 223 467	CTDECAY	36,2004	38	
DRIFTEIT	4744	= 87	7 732 1459	DSPLOCK	1011	101	12 223 1360	DUMMYAE	04,2144	230	1 234
DRIFTCL	0312	= 87	1 735	ESPLV	41,3421	445		DUMMYJCB	01,3207	1108	2 214 1107
DRIFTER	0116	= 1496	2 1467 1488	DSPLYALT	4750	= 1409	2 1404	DUMFCNIC	27,3426	1262	
DRIFTFLC	0036	= 68	3 858 945	DSPLYMSK	20,2113	255	1 294	DUMFLCC	0336	= 99	5 988 989
DRIFTI	E5,1504	= 129	1 376	CSPLYTCT	20,2266	1405	1 1405	DUMPPRA	27,3464	1264	
DRIFTC	E5,1502	= 129	1 378	DSPMM	04,2620	459	1 470	CLMPTFF1	27,3547	1268	
DRIFTSLB	06,3462	333	3 329	DSPMWJB	40,2577	460	2 459 1284	DUMPTFF2	27,2644	1269	
DRIFTT	E5,1442	= 129	1 377	DSPMWJCB	40,3577	= 1284	1 1284	CUNFVLIM	30,3751	918	1 912
DRIVECN	21,3416	1470	1 1471	DSPMMTEM	0140	= 97	2 460	DV/SC	7641	1037	2 1037
DSALMCUT	0011	= 93	36 172 1386	DSPMSK	4757	= 446	1 445	DVBCCSM	30,3565	914	4 913
DSFIXT	0114	= 96	3 446 447	DSPQCTIN	40,3446	447	1 445	DVCNTR	E7,1515	= 148	52 148 1374
DSKYFBIT	4735	= 73	1 1329	DSPQCTWD	41,3371	445	3 409 442	DVCNTR1	E7,1570	= 859	2 857
DSKYFLAC	0112	= 73		DSPQCF	05,3272	222	1 222	DVCNTRF1	33,2223	856	

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DIRECTR	0010	=	1140	1 1136	EARTCNTR	14,2514	928	ELFX	25,3171	670	1 667		
DVLCS	F4,1702	=	118	4 316 675	EARTHGDM	22,3527	717	1 717	FLIDUMMY	E7,1644	=	150 2 150 151	
DVMAX1	34,2763	=	635	1 637	EARTHL	06,3761	1129	2 1132 1134	ELINCR	F7,1554	=	150 4 150 798	
DVMAX2	34,2065	=	635	1 637	EARTHLCC	06,2000	=	29	1 1139	ELINCR1	E7,1446	=	141 5 798 815
DVMCN	33,2314	=	856		EARTHML	27,2022	44	1 773	ELCOPFIN	43,3460	1279	2 1279	
DVMONCCN	36,2554	=	732		EARTHMX	26,3743	1128	2 1122 1124	ELRCODE	04,3361	1230	1 1325	
DVMORX	13,2505	=	1052	3 1051	EARTHMX	0051	=	1140	4 1135 1138	ELRCODE1	40,2156	400	1 395
DVMORACT	0137	=	97	6 1049 1060	EASTPAD	22,3267	715	1 714	ELVDUMMY	E7,1647	=	150 3 150 151	
DVCFE	10,2405	=	1049	11 1051 1062	EARTHPR	27,2420	381	1 381	ELVIRA	E7,1444	=	141 5 141 815	
DVCSUF	21,3072	=	1482	5 1479 1485	EATHR*	27,2447	381	4 376 389	ENABLER6	17,2075	1394	1 1394	
DVPEEV	F7,1575	=	142	4 641 642	FRANK	0093	=	92	88 213 1476	END-ALIG	E7,1630	=	149 3 149 153
DVSIGN	0136	=	97	10 1045 1066	FBANKSAV	1067	102	3 1346 1362	ENC-E3	F3,1777	=	113	
DVTHRLSH	1250	=	105	7 105 856	FRANKTEM	1071	103	6 212 1362	ENC-E4	F5,1400	=	120	
DVTOTAL	F7,1587	=	148	6 148 856	FBANK3	5007	=	1091	3 224 883	ENC-E5	F5,1774	=	129
DVXSC	7423	=	1033	2 1032	FRANK4	4741	=	1091	5 277 885	ENC-E6	F6,1771	=	138
DWNSPTBP	4062	=	155	1 154	FRANK5	5014	1089	14 389 1423	ENC-E7	E7,1777	=	153	
DXCOMP	12,2155	=	1167	1 1167	FRANK6	5015	=	1091	10 213 1476	ENC-E7.0	E7,1745	=	153
DXCPIIT	0124	=	98	2 818 819	FRANK7	5016	1089	16 388 950	ENC-E7.1	E7,1747	=	153	
DXCPIIT+1	0125	=	98		FRUF2	1166	=	104	10 371 372	ENC-E7.2	4000	=	153
DXFRPCR	F6,1446	=	131	9 121 1425	FCO	F5,1751	=	126	3 126 1192	ENC-E7.3	E7,1630	=	153
DYDOT	F4,1740	=	121	4 121 941	FCOUW	F6,1646	=	137	3 127 918	ENC-E7.4	F7,1777	=	153
DYFRPCR	F6,1450	=	131	7 131 1438	FCOLWL	37,3746	918	1 903		ENC-E7.5	F7,1655	=	153
DYMFISP	36,3365	=	750	2 749 750	FCOUWLSR	F6,1646	=	137	3 137 911	ENC-1NM	E7,1672	=	142
DZDOT	F4,1742	=	121	3 121 842	EDCP	0023	=	92	14 441 1280	END-UE	1377	=	108
DZERPOR	F6,1452	=	131	7 131 1438	EDCT	F6,1427	=	134	23 131 1500	ENCALL	40,2263	401	2 401 402
D1/1024	F4,3026	=	1177	1 1186	EDCTP	F6,1427	=	131	4 1425 1428	ENCALM	4153	448	1 454
D1/128	F4,3014	=	1177	3 1177 1181	EDCTG	F6,1436	=	131	5 131 1463	ENCBALL	26,2352	480	
D1/16	F4,3022	=	1177	2 1183 1190	EDCTR	F6,1437	=	131	2 131 1431	ENCLEFF	4303	=	458 1 462
D1/256	F4,3030	=	1177	3 1171 1177	EDOTSQ	F6,1737	=	134	2 1452 1453	ENCBLSB1	40,3577	=	459 1 460
D1/32	F4,3024	=	1177	7 1177 1227	EDRIVEX	F6,1764	138	5 138 1409	ENCCKG	37,2266	380		
D1/4	F4,3020	=	1177	4 37 1190	EDRIVEY	F6,1765	=	138	1 1408	ENCDAFT4	5270	=	150
D1/64	F4,3016	=	1177	5 1166 1192	EDRIVEZ	F6,1766	=	138	1 1408	ENCDOCT	7210	1025	1 1070
D1/8	F4,3012	=	1177	1 1192	EE	13,2506	1128	1 1128		ENCDEDEC	40,3043	426	1 423
D21	F6,1705	=	136		EGRESS	F5,1772	=	127	6 127 1212	ENCDCUSH	6553	1012	1 1012
D29.9SEC	36,3146	=	741	2 726	EIGHT	4750	=	1091		ENCFCVN	40,3256	=	445 1 446
D60P08IT	4752	=	71		EIGHTEEN	32,2437	863	1 862		ENCEXT	5472	=	1362 44 208 1366
D60P9FLG	0072	=	71	10 237 1234	EJSCAN	01,2121	1105	2 1102 1105		ENDEXTVB	5472	=	263 5 268 274
=====	=====	=====	=====	=====	EJ1	01,2172	1107	7 1105 1106		ENCFIND	5160	1097	4 1095 1103
F	F6,1752	=	134	17 1425 1500	EJ2	01,2232	1107	1 1107		ENCHWSS	42,3606	=	428
F/BKCALL	04,2560	=	371		EL	1345	=	108	1 318	ENCIDLE	4207	457	1 1358
F/CALL	04,2577	=	372		ELCALC	35,2714	667	1 670		ENCIMU	17,2623	1317	2 1301 1306
F/JCPWAK	04,2613	=	373		ELFASH	11,2433	816	2 815		ENCINST	4217	457	6 403 1357
F/PRG	04,2000	=	28	2 371 373	ELFPS	35,3646	684	1 667		ENCINT	13,2633	1201	1 227
F/SWITCH	04,2575	=	371		ELFV	F4,1656	117	10 155 670		ENCIT	17,3354	1359	1 1356
EARSFH	11,3414	=	1229	1 1229	ELFVFN	4760	1087	4 469 1461		ENCJASK	17,3273	1448	1 1448

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
ENDJCR1	01,3104	1105	1 1097	ENDSPCCT	40,3451	447		ECURPERM	E7,1670	= 151	1 151
ENDLLJCB	31,3442	= 877		ENDSTATE	11,3606	1233	1 1232	EPHEM	15,2030	= 31	1 577
ENDLRF	34,3617	886		ENDSTEST	36,2652	754		EPHEM1	05,2000	= 29	2 51 979
ENDLPV	33,3622	886	1 886	ENDSUMS	43,3146	292	1 1282	EPSFOUR	35,3652	664	1 673
ENDMANUV	26,2200	476		ENDS4C.9	27,2725	769		EPSILN1	34,2075	625	1 642
ENDMANU1	26,2211	476	2 476 477	ENDT(X)	27,3753	1272	1 1272	ERSILCN	0155	= 1486	5 1478 1486
ENDMARK	5472	1544	2 253 1362	ENDTASK	5236	1113	4 221 1120	EPSILCNL	E5,1763	= 126	3 126 1187
ENDMARKS	07,2217	253		ENDTST1	37,2270	276	3 374 389	EPSILCNT	E4,1576	116	2 1168
ENDMAXPV	10,2624	1055	2 1055 1057	ENDTFE	27,2641	1269	3 1269 1271	EPSSMALL	27,2723	769	1 769
ENDMODE	07,2700	1318	2 1218	ENDTNCN	06,2266	165	1 165	ERS1	27,2435	759	2 759 769
ENDMONCR	41,3354	441	1 441	ENDTNCN2	06,2306	166	1 165	ERS2	27,2407	760	2 759 769
ENDNMIST	40,2247	401	2 401	ENDTRUSH	6555	1012	2 1012 1065	FRAC	04,2000	45	1 1131
ENDNUM	40,2257	401	1 401	ENDTSLC	00,2212	1044	1 1044	ERACFEIT	4737	= 67	
ENDNVBSY	14,2637	466		ENDVDAT	33,2456	= 882	3 EE1 864	ERADELAG	0021	= 67	5 657 1131
ENDNVSE1	41,3620	454	1 459	ENDVLOAD	6514	1011	2 1013	ERADM	E7,1672	= 145	5 145 1131
ENDOFFJCB	5155	1097	158 225 1476	ENDVPLSH	6543	1012		ERASCFK	43,3360	1278	1 1277
ENDOUT	10,3313	1359	2 1361	ENDVXV	7003	1018	4 1018 1035	ERASCCN1	43,3252	1276	1 1278
ENCPASTE	4142	441		ENDW	F5,1642	= 122	3 124 127	ERASCCN2	43,3254	1276	1 1278
ENCPINCF	4512	= 467		END2DFC	40,3241	444		ERASCCN3	43,3255	1276	1 1278
ENDPIAS1	40,3737	= 473		END29FDC	32,2771	607	1 607	ERASCCN4	43,3256	1276	1 1278
ENDPIAS2	41,3743	= 471		ENFMA	05,2763	217	2 826 1373	ERASCCN5	43,3264	1276	1 1279
ENDPOS	33,3650	388	1 988	ENGINCFE	36,3551	753	1 753	ERASCCN6	5007	= 1276	3 1278 1279
ENDPRCHG	01,2746	1101	2 1101 1107	ENGINCF1	36,3561	753	1 231	ERASER	10,3472	1362	1 1355
ENDR76	13,3333	711	2 709	ENGINCF2	36,3555	753	1 846	ERASIC	5011	= 37	1 989
ENDRACAR	25,3531	567	2 539 543	ENGINCF3	36,3570	753	1 725	ERASLCOP	42,3410	1278	4 1278 1279
ENDRDLIC	40,3324	422	1 426	ENGINCF4	36,3565	753	1 735	ERASZERC	0007	= 154	2 154
ENDRELC5	41,3550	= 452	1 458	ENGDFE	14,2347	845	1 840	ERCNT	0117	= 56	7 469 473
ENDRET	10,3336	1359	5 1354 1361	ENGDFEET	F7,1644	= 153	3 153 E46	FRCCM	40,3721	472	1 473
ENDRMCFE	4616	= 527		ENGDFE1	14,2402	846	2 846	FRCCMF	E5,1563	= 129	8 377 381
ENDRELL	22,3226	370		ENGDFTSK	36,3546	753	3 241 755	FRCCN	40,3733	473	1 472
ENDROEAT	41,2220	412		ENGDFBIT	4745	= 74	6 175 908	FRCCOUNT	1265	= 108	3 108 1276
ENDRQAT	41,3523	450		ENGDFNFG	0123	= 74		ERESTCRE	1360	= 108	11 108 1279
ENDRRD29	24,3475	619	3 608 609	ENTER	41,2002	407	2 400 448	EREXIT1	32,2542	575	1 573
ENDRRMON	06,3140	= 188	1 188	ENTERDAT	07,2073	246		ERMINUS	40,3713	472	
ENDSPSTP	05,2637	214	2 218	ENTERJMP	40,2157	400	1 400	ERRLUS	40,3716	473	1 472
ENDRTOUT	41,2622	= 418	1 427	ENTERGR	17,2445	1437		ERROP	40,3646	472	1 359
ENDROUTIN	41,3236	= 433	1 435	ENTERLV	17,2500	1438	3 1437	FRPCRS	43,3300	1276	1 1276
ENDR2	41,2247	296	1 296	ENTEXIT	0136	= 407	10 408 445	ERTRFST	17,3261	1452	
ENDR2GRD	24,3500	605	1 608	ENTMID1	13,3574	1214	1 1214	ERTHR	27,2431	381	1 381
ENDSAM	14,2562	929	1 928	ENTMID2	13,3570	1214	1 1214	ERTHFVSE	37,2401	381	2 384 389
ENDSCALE	40,3077	434	3 433 434	ENTPASHI	41,2012	407		ERVECTOR	E5,1404	= 126	5 128 381
ENDSCALI	40,3112	434	2 435	ENTRASC	41,2035	408	3 407 456	ESCAPE	0136	= 97	4 1076 1077
ENDSPF	41,3373	442	1 445	ENTREST	0136	= 97	6 403 455	ESCAFE2	0137	= 97	2 1076 1077
ENDSPWIN	42,2451	476	1 476	ENTSET	41,3576	455	2 455	ESTICADR	37,2116	375	2 375
ENDSPWM	04,2630	455	1 466	ENTTIM2	04,2767	702	1 702	ESTIMS	37,2510	384	2 375 378

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ETPIRIT	4745	=	69	FAZAB	23,3150	1148	1 1149	FIFFSDF	34,2101	635	1 643
ETPIFLAG	0046	=	69	FAZAB1	23,3176	1148	1 1148	FIFTYFVS	34,2663	643	1 642
FXBRAP	31,3231	805	1 792	FAZAR2	23,3202	1148	1 1148	FICTIME	35,2756	668	
FXCSPFT	10,2621	1350	5 2 8 282	FAZAB3	23,3211	1148	1 1148	FILCELV	E5,1460	=	129 1 129
EXFCBANK	5163	1097	8 1095 1097	FAZAR4	23,3221	1148	1 1149	FILLFC	01,3372	1118	1 1117
EXFCTEM1	0061	=	95	FAZAB5	23,3230	1149	2 1149 1213	FILLER	E7,1622	=	150 1 150
EXFCTEM2	0062	=	95	FAZA1	23,2777	1146		FINALBIT	4746	=	69
FXGSDP	31,3210	805	1 792	FAZB	23,3072	1147	1 1146	FINALCV	00,2625	1056	3 1049 1055
FXIT	6746	1017	1 995	FAZB1	23,3075	1147		FINALFLC	0047	=	69 7 618 693
EXITEM	0114	=	96	FAZB2	23,3123	1147	1 1147	FINDCDLW	30,3100	903	5 764 903
FXITSPDT	31,3306	805	2 844	FAZB5	23,3130	1147	1 1147	FINDCIMP	27,2160	485	2 483 484
FXITVP	30,2771	844	1 844	FAZC	23,3136	1147	2 1147	FINDKEY	07,2365	254	1 254
FXITVP1	30,3002	844	1 845	FBANK	0004	=	92 31 457 1367	FINDTIME	01,3602	1294	2 1294
FXACPM	31,3327	806	1 792	FIANKMSK	4350	=	1062	FINDVAC	5105	1095	45 212 1382
FXCVFLCW	31,3420	807		FETASSUR	06,3652	337	3 335 236	FINDVAC2	01,2602	1098	2 1095 1097
EXTLOGIC	31,3225	804	2 791	FGR3	11,2504	1220	1 1234	FINE	01,2341	297	1 295
EXTVBACT	1043	102	15 223 1370	FGR	E7,1615	=	150 3 150 786	FINEK2	43,2402	274	
EXTVRCBK	07,2006	244	1 244	FCADRMM1	04,2404	234	1 233	FINEONLY	14,3362	540	1 540
EXTVP1	23,2000	=	32 1 271	FCCLW	30,2000	=	34 1 903	FINETIME	4102	382	3 380 1326
EXTVERES	43,2000	=	36 7 262 1378	FCDDC	E7,1465	=	141 6 141 787	FINMLCC	37,2320	379	1 375
EXVPT	31,2415	807		FCCLC	E7,1620	=	150 5 150 794	FIREDB	E6,1601	=	135 10 1452 1453
F0	E7,1676	=	146	FCOMPSET	31,2215	787	1 787	FIREFCT	E6,1741	=	134 7 1425 1455
F01	E4,1630	=	117 1 117	FCPIX	E4,1744	119	2 306 480	FIREP	16,3041	1421	
F02	E4,1626	=	117	FCPIY	E4,1745	119		FIREQP	17,2257	1434	
F1	E7,1700	=	146	FCPIZ	E4,1746	119		FIRSTIME	12,2606	1174	1 1174
F1345678	43,3371	1278	1 1279	FCPT	26,2006	52	1 1135	FIRSTTIME	27,3171	772	
F2	E7,1702	=	146 1 146	FDRS	36,2000	38	1 747	FIVE	4756	1087	25 224 1420
E2DPS	E7,1621	=	150 2 779 820	FEEDBACK	17,3100	1445	1 1444	FIXCLFAS	40,2402	403	
E3	E7,1704	=	146	FETCHZAB	30,3210	506	1 506	FIXDELAY	5221	1111	16 501 1303
F3J22R2M	1347	108	1 1228	FETCHZWD	E5,3652	586	2 584	FIXLCC	0120	56	63 246 1496
F32C31RM	1350	108	1 1227	FEXTRA	4737	=	790 1 787	FIXMIA	20,3747	1495	1 1491
F70VFLA	E7,1471	=	141 3 141 148	FETAG1	4000	=	28 3 1284 1365	FIXRANCE	40,2706	420	1 419
-----	-----	-----	-----	FETAG10	4000	=	28 1 156	FIXPCT	00,3453	1072	3 1071
F	E7,1734	144	7 144 767	FETAG11	4000	=	28	FIXY	27,2441	762	1 762
F(MASS)	20,2544	1477	3 1477	FETAG12	4000	=	28	FLAGGON	22,3310	714	1 714
FACERFG	0154	=	1363 8 1363 1354	FETAG13	4000	=	28	LAGOFF	35,3505	679	1 678
FAJL-	20,2551	1491	1 1491	FETAG2	4000	=	28 2 1294 1296	FLAGON	35,3441	678	2 678
FAILCCP	17,3237	1448	2 1449	FETAG3	4000	=	28 1 1299	FLAGCCW	E6,1651	=	137 6 137 512
FAILCFG	0375	109	12 212 1371	FETAG4	4000	=	28 2 1344 1365	LAGORGY	32,3020	778	
FAKSPFT	5164	1097	2 1095 1105	FETAG5	6000	=	28 3 40 596	LAGS	13,3750	1374	1 1373
FALTCF	4374	463		FETAG6	6000	=	28 5 518 1449	LAGWRDC	0074	=	65 32 166 1405
FALTON	4364	463	10 233 1386	FETAG7	4000	=	28 2 1371 1372	LAGWRD1	0075	=	67 33 218 1305
FAPS	36,2006	38	2 751 768	FETAG8	4000	=	28 1 441	LAGWRD2	0076	=	68 32 166 1375
FASTCHAG	31,3717	820	9 787 804	FETAG9	4000	=	28 1 1394	LAGWRD3	0077	=	70 22 207 1374
FAZA	23,2773	1145	1 1147	FHM	25,3562	571	1 570	LAGWRD4	0100	=	71 34 223 1364

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FLAGWRD5	0101	=	73 34 158 1443	FORMULA3	17,3651	1457	1 1457	GAINAPP	E5,1466	=	122 1 122
FLAGWRD6	0112	=	75 15 187 972	FORBYONE	13,3450	1211	1 1204	GAINBRK	E5,1432	=	122 2 122 804
FLAGWRD7	0113	=	77 33 187 1381	FORVEL	E7,1701	=	151 2 151	GAINFLTP	36,3747	=	918 1 912
FLAGWRD8	0114	=	78 16 258 964	FORVMETR	E7,1677	=	151 2 151 893	GANCCMP	11,2655	1222	3 1221 1222
FLAGWRD9	0115	=	80 6 731 843	FOUR	4751	=	1091 47 212 1462	GAMMA	E7,1477	=	146 5 146 1145
FLAP	0216	=	81 3 828 834	FOLRSFCS	27,2536	765	1 764	CAMPREV	E7,1607	=	142 7 142 643
FLAPPT	4744	=	81	FOURTEEN	4317	=	1065 2 566 1062	GAMRP	0010	=	1120 3 1126 1130
FLASHF2	21,2022	823		FR	E7,1467	=	141 5 786 788	GCCMP	E3,1471	=	111 24 111 945
FLASHOFF	4422	464		FRANDPS	05,2000	=	29 2 43 212	GCCMPSUE	06,3433	332	6 330 331
FLASHPCN	4427	464		FRCS2	26,2070	38	2 745 766	GCCMPSW	E3,1477	111	10 327 384
FLASHSLR	17,3261	1356	3 1356 1357	FRCS4	36,2016	38	1 748	GCCMPZER	06,3707	337	1 958
FLASHV2	21,2330	823	1 823	FREEFBIT	4751	=	66 1 958	GCCMP1	06,3546	334	1 334
FLAT	F6,1555	=	135 6 1453 1493	FREEFLAG	0014	=	66 12 935 978	GCTP	E5,1736	=	124 10 124 559
FLATEMP	0151	=	1495 6 1497 1493	FREEER	0144	=	97	CESELECT	07,3620	1316	1 1311
FLATOUT	31,2316	789	1 733	FRSTPAS	34,2644	642	1 642	GCT/2	1235	105	19 105 965
FLATOUT1	31,2225	787	1 787	FRSTZERC	20,2752	1480	1 1480	GDT1/2	E7,1562	=	146 5 148 876
FLATOUT2	31,2227	787	1 787	FSPASPT	4742	=	66	GCUMP1	31,3432	807	
FLATVAL	21,3767	1496	1 1497	FSPASFLG	0005	=	66 3 512	GTACDF	6141	997	1 997
FLFSLCC	10,2000	=	29 1 1255	FSLBC	26,2014	53	1 1135	CEFF	E4,1714	=	120 4 121 642
FLFSHCT	10,2037	1255	2 856 1255	FTHRCT	21,2000	=	34 2 40 786	GENDEV	00,2570	1054	2 1053 1057
FLGARD10	0106	=	82 24 82 1477	FTS9999	30,2057	614	2 613	GENMARK	10,3022	1354	
FLGWRD11	0117	=	83 35 230 888	FLFLNEED	F7,1666	=	151	GENMASK	0162	=	1363 4 1346 1359
FLGWRD12	0110	=	85 2 85 877	FULLAPS	05,2000	43	1 213	GENPL	E5,1434	=	128 27 128 129
FLGWRD13	0111	=	87 1 87	FULLDSP	41,3665	469	1 469	GENRET	1142	104	4 515 522
FLIP	4606	527	2 823	FLLDSP1	41,3666	469	1 469	GENSLC	00,2346	1046	2 1048
FLGCSUB	30,2000	=	34 1 851	FULTIME	17,3520	1454	6 1455 1455	GENSCR	00,2277	1047	4 1046 1068
FLPASFC	E7,1623	=	150 6 150 804	FLNCT1CN	F6,1751	=	133 16 1464 1472	GENSHFT2	00,2224	1045	1 1045
FLPAUTNC	F6,1652	=	137 4 137 908	FLNCT2	21,3240	1465	2 1464	GENSHFT	00,2214	1045	1 1036
FLPC	0212	=	80 2 840	FUNCT3	21,3243	1465		GENTRAN	5544	1369	4 258 1492
FLPCBIT	4740	=	80	FLNAYDSP	E7,1666	=	151 5 151 316	CFQCCMPS	E5,1562	=	129 3 385 386
FLPT	0213	=	80 3 831 843	FUNITEM	0157	=	1496 2 1487 1488	GECIMLT	37,2004	374	
FLPIBIT	4741	=	80	FV	E4,1461	=	115 15 115 1236	GECM	04,3112	1160	2 1178 1185
FLRCS	0214	=	80 4 826 846	FWAGGADR	01,3774	1298	1 1295	GECMSCN	E5,1672	=	126 11 126 1186
FLRCSPT	4742	=	81 2 843	FWCOMP	31,2263	788	2 788	GECRGEJ	37,3107	390	2 388 389
FLTRSLR	30,3470	912	2 905	FWFIGHT	E7,1610	=	150 7 150 813	GECRGEK	37,3111	390	
FLUNPPT	4742	=	79 3 731 843	FXADRS	43,3600	1281	2 1282	GECSTR4	37,3025	389	
FLUNDISF	0175	=	79 4 734 826	FXFX	43,3564	1281	1 1282	GFT.LVC	06,3741	692	2 759
FLVR	0210	=	80 4 827 844	FZDPS*11	11,2000	=	29 1 814	GETMCA	06,3725	692	1 680
FLVRRIT	4736	=	80	FZDPS*31	31,2000	=	34 2 35 816	GETABVAL	33,2217	855	1 855
FMAXDDC	31,2002	40	1 787	FZDPS*32	32,2000	=	34 3 40 778	GETACSLV	20,2246	1467	
FMAXPCS	31,2003	40	1 787	FZDPS*34	34,2000	=	34 1 784	GETAZEL	14,3735	945	3 948 949
FORCECNE	20,2034	294	1 294	=====	=====	=====	=====	GETACR	01,3517	1124	1 1124
FORCEV25	42,3603	438	2 438	G(FSM)	E4,1716	=	121 4 121 875	GETCOMP	41,2517	417	5 415 417
FORMULA1	17,3526	1455	1 1454	G+N,ALTC	26,2261	477	3 476 740	GETCAT	07,2163	246	4 244 252
FORMULA2	17,3546	1455	1 1454	CACC	E5,1706	=	124 4 958 959	GETDT	36,2741	756	2 752 755

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
GETECC	12,3720	1192	1 1192	GCAGIN	10,3051	= 1362		GONXTBANK	43,3703	1282	3 1282
GETTRAD	13,2466	1128	1 1121	GJALMCYC	41,2352	413	1 433	GCCCCARG	21,3451	1471	2 1471
GETGDEL	27,3177	773	1 772	GJANICLE	10,3142	1356	1 1356	GCCDENE	07,3657	1318	4 245 1318
GETINREL	40,2324	402	4 402 405	GGBAC	13,3461	1211	2 1211	GGOOFPS1	20,2610	1478	1 1478
GETLMATT	15,3524	972	1 968	GGBACK	35,3733	741	2 740	GGOOFPS2	20,2634	1479	1 1479
GETMAXDT	13,3346	1210	1 1209	GGBAQUE	11,3000	1224	3 1226 1233	GGOOMANL	22,3234	370	1 364
GETMKS	07,2202	252	3 248 261	GGBR	4054	155	1 154	GGOONEG	20,3024	1483	1 1482
GETNEWNM	5427	1290	1 1289	GGBLTIME	F7,1511	= 148	3 148 773	GGOORAD	25,3254	558	1 560
GETPART2	01,3542	1293	1 1293	GGBH56	17,2115	1394	2 1394	GGOPEFRS	10,2706	1352	
GETPRIC	5423	1289	2 1289 1292	GGBLCE	21,3614	1474		GGOPEFS	10,2626	1350	
GETRAS	36,3662	754	1 754	GGBTOFF	36,3066	739	2 723 725	GGOPEF1	10,2624	1350	10 499 1325
GETROCT	21,3274	1465		GGBSP	10,2444	1347	1 843	GGOPEF1R	10,2704	1352	
GETRPSV	11,2627	1222	1 1222	GGBSPALM	41,2353	413	20 407 455	GGOPEF2	10,2631	1350	
GETRVA	37,3326	706	2 704 707	GGBSPR	10,2452	1347	2 476 537	GGOPEF2R	10,2711	1352	2 476 513
GETRVN2	37,3363	707	1 706	GGBSPRET	10,2447	1347	4 749 943	GGOPEF4	10,2634	1351	2 495 655
GETULC	26,3333	589	2 580 591	GGBSPRS	10,2640	1351	8 1345 1352	GGOPEF4R	10,2714	1352	2 521 967
GETVRV61	27,3113	772	1 772	GGBSPRS1	10,2642	1351	1 1347	GGOPIN	43,2115	264	22 265 296
GETVRV62	27,3115	772	1 772	GGBSPR1	10,2453	1347		GGOFLAY	10,3071	= 1362	1 1350
GETX	12,2767	1181	3 1178 1191	GGBSPR2	10,2454	1347	2 1345 1348	GGOQCCCC	5655	1373	1 242
GET22/32	21,2543	896		GGBSP2	10,2445	1347		GGOQOF1X	04,2024	225	2 225 242
GET45	35,3542	680	3 680	GGBSTIMS	37,2113	375	1 375	GGOPCS1	36,3053	729	2 723 724
GFACTV	20,3105	1484	1 1479	GGBXTVB	42,2000	262	1 409	GGOPRDE	05,2665	216	2 154 155
GIMBLBTS	20,3077	1484	2 1480	GGBFLASH	10,2477	1348	43 226 969	GGOPRG2	05,2766	217	2 231 286
GIMLOCK1	20,3433	1244	1 1243	GGBFLASHR	10,2636	1351	2 747 752	GGOPRG2A	05,2767	217	1 217
GL+NOATT	40,3725	473	1 472	GGBFLASH2	10,2501	1348	15 1345 1351	GGOPRG3	05,2773	217	2 217
GLAMPTST	06,2507	171	1 171	GGBCMARK	10,2406	1346		GGO	41,3031	420	1 430
GLIMVERT	06,2500	171	1 171	GGOCPROG	04,2226	231	1 232	GGOQTRIM	21,3106	1462	2 1462 1474
GLOCKCHK	06,2441	170	2 171	GGOINT	35,3372	677	2 670	GGOEACAX	37,3434	852	1 854
GLOCKNEN	06,2434	170	1 168	GGOITER	12,3415	1187	1 1187	GGOSEPV	33,2274	856	
GLOCKCK	5270	= 182	4 171	GGOCLDLV	43,2414	275	6 262 263	GGOHOSLV	43,3115	= 291	1 263
GLOKFIL	0756	= 70	3 230 1244	GGOCC	0705	= 1298	30 1293 1298	GGOLEEPS	10,2755	1353	3 1350 1361
GLOCKFPT	4736	= 70		GGOANLR	07,2742	1321	1 476	GGOANCL5	32,2630	604	1 604
GMBORBIT	4742	= 76	1 774	GGOARK	10,2330	1344	1 1362	GGO	6651	1015	13 1016 1083
GMBDRVSW	0137	= 76	2 774 775	GGOARKE	10,2334	1345	12 208 1362	GGOICERS	6665	1015	1 1015
GMBLBTA	21,3624	1474	1 1473	GGOARKFR	10,2353	1345	6 271 1362	GGOICGE	6700	1016	1 1015
GMBLBTR	21,3626	1474		GGOARKR	10,2350	1345	1 1362	GGOIGIS	17,2636	1440	1 1432
GMERGE	07,3472	1313	1 1316	GGOARK2	10,2337	1345		GGOICPCH	6001	225	64 218 1327
GMOE	E4,1501	= 115	1 115	GGOARK2R	10,2356	1345		GGOIGV56	6025	556	13 477 517
GN/GCCDE	5001	1088		GGOARK3	10,2342	1345	1 209	GGOIT	E5,1714	= 124	3 557 559
GNUEAF25	37,3527	854	2 852 853	GGOARK3R	10,2362	1345	2 272 297	GGOVUFCT	40,3353	445	1 413
GNUP	07,1656	= 151	4 878 883	GGOARK4	10,2345	1345	2 252 278	GGOXSP	10,2330	= 1362	
GNURVST	33,3476	882	2 879 882	GGOARMS	10,2331	1345		GGOXCSFF	10,2334	= 1362	13 266 1360
GNUTFA25	37,3523	854	2 852 854	GGOIDAV	36,2202	726	1 726	GGOXCSFR	10,2353	= 1362	3 294 296
GNUV	07,1656	= 151	1 882	GGOID	04,2222	231	1 232	GGOXCSR	10,2350	= 1362	
GCAORT	32,3547	826	1 241	GGOIVE	23,2111	487	1 487	GGMATRIX	06,3140	189	1 185

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GRABGRAV	15,2721	959	1 959	H	F4,1477	=	115 2 115 1234	ITEMCUT	1006	=	101 4 423 426
GRAVEL	15,2601	957	1 957	H*GFCR*Y	0131	=	2 787	HITEST	33,2516	=	869
GRFFD	15,2714	959	1 959	HAFPA1	E7,1603	=	3 637 639	HICUNITX	23,2521	=	37 1 490
GRP2OFF	21,2141	867	2 867	HALF	4736	=	1091 31 335 1500	HICUNITY	23,2517	=	37 2 490
GRP2PC	04,4226	1217	24 455 1233	HALFARG	E6,1747	=	132 4 1472 1474	HICUNITZ	23,2515	=	37 4 490 520
GRP2SVC	55,1711	=	127 3 127 1217	HALFDP	12,2004	=	1093 3 931 1223	HI10	04,3356	1320	1 1325
GRF4CFE	22,3677	828		HALFREY	06,3723	692	2 692	HIF	4350	463	10 158 1282
GSAV	54,1630	117	10 117 974	HALFSEC	24,3120	513	1 511	HIFZERCS	23,2523	=	37 17 300 1273
GS04IF	22,3651	822	2 822 812	HANDACR	17,2622	1435	1 1438	HIGHT	25,3600	615	
GSFLFCT	07,3425	1312	3 1311	HANG20	06,2071	158	1 157	HLITF	4747	=	616 2 615 823
GSHIFT	7624	1036	1 1003	HAPC	F4,1716	=	118 4 118 620	HMEAS	E7,1654	=	150 8 150 886
GTMP	0026	=	979 5 977 979	HAPGX	F4,1517	=	115 4 115 720	HMSIN	42,3452	436	1 433
GTS	21,3070	1462	1 1440	HAVEGLES	11,2002	686	1 769	HMSOUT	42,3230	422	1 418
GTSCADR	17,2653	1440	1 1440	HAVENCFM	04,3144	1180	1 1180	HOLD	0165	=	1456 2 1494
GTSEIN	42,2147	206	1 432	HAVEGUCT	21,2174	1464	1 1464	HOLDQ	E6,1745	=	134 2 1451 1455
GTSEINLC	42,2163	432	1 432	HRAC	34,3620	887	1 886	HOLEW	E5,1734	=	127 7 127 1147
GTSCULT	42,2141	305	1 418	HREMANANT	23,2002	41	1 890	HPER	F4,1720	=	118 2 315 620
GTSCULTL	41,2566	418	1 418	HREMANP	E4,1672	=	120 2 877 890	HPERMIN	F4,1600	=	116 6 116 721
GTSCQCN	21,3104	1462		HSCAL	E7,1534	=	148 8 148 878	HPERX	E4,1521	=	115 2 315 721
GTSCAXIS	21,3124	1463	1 1453	HSCALC1	F7,1774	=	152 4 316 871	HRCCLN	42,3536	437	2 436
GTSCRT	21,3432	1471	1 1472	HCTDISP	F7,1473	=	148 11 120 876	HRCCLN1	42,3277	423	1 423
GTSTMFPS	F6,1737	=	133 13 133	HEDTJET	16,3511	1428	1 1428	HSCAL	33,2010	41	1 877
GUFSS	37,2020	374		HFAIL	23,3522	883	2 878	HSTILBAD	34,3630	887	2 886 887
GUESBJT	4752	=	68	HFLSHRIT	4753	=	85 3 615 823	HUGECLCT	21,2171	1464	1 1463
GUFSSW	0134	=	68 3 686 1186	HFLSHFLG	0263	=	85 2 878 883	=====			
GUFSSI	37,2255	378		FF	F6,1747	=	134 15 1454 1457	IBNKCALL	4674	952	64 166 1487
GUIDCURN	32,3260	782	1 775	FIASCENT	E6,1400	130	4 213 1477	IC	E7,1655	=	144 6 765 772
GUIDINIT	34,3343	834	2 779 831	FIDESCNT	20,2002	43	1 1477	ICDLFAIL	06,2703	=	181 1 182
GUIDSLB	31,2406	792	1 805	FIOPHAF1	23,2521	=	37 6 485 1241	ICORK2	43,2215	268	
GUILCEN	31,2421	793		FIOP1/4	23,2513	=	37 1 1273	ICADCTAB	42,2650	315	2 305
GUILDET	31,2537	795	3 792 794	FIENERGY	12,3432	1188	1 1187	ICADCTEM	0142	=	97
GVDFTER	15,2561	956	2 958 972	HIGATASK	33,2447	868	1 870	ICACITEM	0150	97	4 305 431
GWAKE	07,3366	1310	1 1311	HIGATCHK	33,2522	865		ICAC2TEM	0151	97	2 305
GWAKE2	07,3326	1309	1 1311	HIGATJCB	33,3636	888	1 868	ICAC3TEM	0152	98	
GWCNARS	14,3156	937	1 924	HIGHCPIIT	F5,1507	=	122 1 122	ICLEACR	05,3344	223	1 220
GYPCDF	15,3027	961	1 960	HIGESTF	22,3647	822	1 803	IDLEFRIT	4745	=	78 4 753 860
GYROAGRE	07,3340	1309	1 1309	HIGH4	7745	1090	3 998 1015	IDLEFLAG	0161	=	78 7 732 846
GYROBUSY	07,3361	1310	1 1305	HIGHS	7747	1090	8 246 998	IDLEMASK	10,3011	1354	1 1358
GYROCMC	0047	=	92 6 176 1315	HIMINCCN	42,3376	425	1 424	IDLEACR	16,2155	1403	1 1403
GYROEXIT	07,3531	1314	1 1314	HINJECT	32,3750	830	1 834	IDLERET1	10,3302	1358	
GYROFRAC	07,3621	1316	2 1313 1316	HIPP10	10,2523	1348	1 1348	IDLESLEF	10,3535	1363	1 1353
GYROTRIM	15,2764	960	1 966	HIRTRCT	4737	=	40 1 752	IERASTST	6120	957	1 957
GYTCBFTC	F5,1462	=	128	HISCALAR	0003	=	93 2 382 1018	IFAILINE	05,3346	223	1 217
G21	F6,1737	=	136	HISECCN	42,3375	425	1 424	IFAILJMP	06,2755	182	1 163
=====				HITEMIN	0123	=	96 3 436 437	IFAILCK	07,2226	1307	1 1206

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IFLAGC	13,3775	1215	1 1276	IMPULSE	07,3315	1309	7 274 1390	INTERCNC	20,3064	1484	1 1478
IFLAGP	13,3752	1215	1 1215	IMUSE	0007	= 66	7 232 1325	INFINAPC	12,3747	1192	2 1192
IFLAGAL	10,2562	1349	1 1349	IMUSEBIT	4744	= 66	2 166 209	INFINBIT	4745	= 79	
IG	76,1725	= 136		IMUSEFLG	4744	= 1321	1 173	INFINFLG	0270	= 79	4 1178 1187
IGC	55,1741	= 124	3 124 1244	IMUSLLLG	37,2315	379	2 375 385	INFINITY	12,3205	= 1184	5 1181 1184
IGNALG	32,3032	778		IMUSTALL	07,3710	1320	12 209 961	INFLIGHT	23,2000	= 32	2 325 1235
IGNALGRT	32,3213	781		IMUSUPER	37,2000	= 36	1 291	INAGS	56,1633	= 135	8 1402 1494
IGNALQOP	32,3171	779	1 781	IMUVAR	26,3435	590	2 585 586	ININDEX	56,1744	= 133	5 1471 1472
IGNAQSQ	56,1412	130	1 732	IMUZERC	07,2706	1300	3 209 379	INITAET	4752	= 80	2 563 564
IGNAQSP	56,1413	130	1 732	IMUZERCA	07,2716	1300	1 1300	INITALGN	0205	= 80	4 563 572
IGNFLAG	0152	= 77	3 729 752	IMUZERCK	43,2127	265	1 265	INITRY	15,3111	563	1 563
IGNFLRIT	4737	= 77	2 730 735	IMUZERCC2	07,2751	1301	1 1300	INITCCOW	30,3171	503	2 726 826
IGNITE	36,3106	739	1 738	IMUZERC3	07,2760	1301		INITDSE	10,3040	1354	1 1293
IGNITFI	26,3122	740	1 739	IMUZERR	07,2325	379	1 374	INITREAD	25,3123	556	6 555
IGNITION	36,2432	731	2 241 739	IMU2	37,2000	= 36	2 44 374	INITSI	34,2061	635	2 636 642
IGNYL2	36,2425	730	1 730	IMU4	37,2000	= 36	1 384	INITV	12,3516	1189	3 1187 1188
IGPET	47,1675	= 146	2 587 588	IM30INIF	05,3360	224	1 213	INITVEL	11,2000	686	2 674 755
IGSAFEX	27,2125	484	1 484	IM30INIR	05,3361	224	1 217	INITVELX	11,2260	690	1 690
IMDATEF	01,2621	1255	4 1254 1257	IM30INIT	5026	= 224	2 214 223	INITVEL1	11,2026	686	1 686
IMMERFFT	10,3370	1360		IMBQND	27,2550	1268	1 1267	INITVEL2	11,2062	687	1 689
IMODES31	1277	116	67 162 1322	IMCZ	15,2310	550	1 552	INITVEL3	11,2105	687	2 687
IMODES32	1270	116	48 165 1470	IMCORPEX	57,1674	= 145	5 145 1128	INITVEL4	11,2137	688	1 688
IMPLRURN	36,3526	752	1 732	IMCORP1	23,2533	1141	1 590	INITVEL5	11,2166	689	1 689
IMPULPIT	4743	= 69	2 732 755	IMCORP2	23,2745	1145	1 590	INITVEL6	11,2230	689	1 689
IMPULSW	1744	= 69	5 752 767	IMCORP1	23,2567	1142	1 1142	INITVEL7	11,2233	689	1 688
IMUTTCK	43,2727	282	1 262	IMCOR1A	23,2576	1142	1 1142	INITWXX6	26,3231	587	1 587
IMURACK	37,2105	374		IMCOR1B	23,2625	1142	1 1142	INJARG	32,3622	827	1 828
IMURAC	07,3631	1317	5 166 1317	IMCOR1C	23,2632	1142	2 1142	INLINK	0045	= 52	2 223 1325
IMURADP	1301	= 116	4 209 1317	IMCOR2	23,2674	1142	2 1142 1150	INLUNCHK	11,3335	1229	1 1230
IMURACE	06,2565	175	1 182	IMCOR2AB	23,2724	1144	1 1144	INPEL	0137	= 57	23 401 406
IMUCHK	15,3635	975	2 943 567	IMCOR3	23,2730	1144	1 1144	INRELTAB	40,2330	402	2 402 405
IMUCDARK	43,2206	268	1 267	INCP	01,2417	1080	1 1004	INT-ABRT	11,3023	1224	1 1224
IMUCDARS	07,2772	1312	4 268 545	INCRDCNL	22,3035	366	2 367 368	INTW	13,3534	1213	2 1212
IMUCDARV	43,2227	268	2 268 259	INCEP	55,1765	= 126	4 1174 1175	INTBANK	13,3043	1204	1 1204
IMUCOMP	06,2300	= 29	1 327	INDFRASE	6211	598	1 998	INTBITAR	12,3464	1211	2 1210 1211
IMUFAIL	06,2703	= 181	1 182	INDEX	6151	598	1 596	INTBIT15	0115	56	7 56 598
IMUFINE	07,3202	1316	4 274 1321	INDEXFS	17,3134	1445	3 1444	INTBL5+	0114	56	7 56 1496
IMUFINEC	07,3224	1306	2 1306 1311	INDEXSI	23,3765	1254	1 1253	INTEGRV	13,3135	1207	12 237 1215
IMUFINEK	42,2363	274	1 262	INDEXLCC	6130	= 57	12 598 1081	INTEGRVS	13,3110	1206	7 656 781
IMUFINEV	43,2413	274	1 274	INDEX2	6167	598	1 598	INTEGRV1	13,3127	1207	2 1205
IMUFIN20	07,3202	= 1321		INDJLV	6277	1003	6 597 1000	INTEGRV2	13,3142	1207	1 1234
IMUGOCP	07,3630	1317		INDWORK	6207	598	1 598	INTEXTI	13,3226	1208	3 1209 1210
IMUMON	06,2172	162	2 165	INDXYZ	16,3576	= 1430	1 1419	INTFLAG	0227	= 82	
IMUCP	06,2622	177	1 182	INERCCNA	20,3045	1483	1 1479	INTLEIT	4736	= 82	2 216 1211
IMUCP2	06,2643	177	1 177	INERCCNF	20,3063	1484	1 1478	INTGRATE	11,3372	1225	2 1225 1230

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INTGROAL	26,3242	587	7 579	587	ISITATLC	26,2266	478	1 266	ITSWICH	0151	= 77 5 630 667
INTIME	57,1607	= 143	5 663 689	ISITNOG	17,3156	1356	1 1356	ITSWTLST	01,3742	1297	1 1296
INITINIT	13,2000	= 30	4 46 1212	ISITPRIO	10,3241	1257	2 1258	ITURNON	06,2533	173	1 182
INTINT	35,3276	677	6 625 675	ISLIST+0	4224	457	2 457 466	ITURNON2	06,2556	174	2 173 177
INTINT2C	34,3062	647	2 639 640	ISSRVN	04,2107	229	1 228	=====	=====	=====	=====
INTINT3P	34,3071	647	2 630	ISSUF	06,2321	166		JACCUV	20,2646	1479	1 1478
INTLOOP	35,2514	662	1 662	ISSWOF	06,2716	180		JANFRCC	4243	457	
INTLZ	21,2356	893	1 893	ISSWON	06,2726	181	1 180	JANTERM	4231	457	1 1357
INTMCBS	41,2116	409	2 408	ISSZERC	06,2361	167	1 175	JAPFG*	ES,1464	= 122	1 122
INTOTIS	13,2300	710		ISWCALL	4700	592		JBRFG*	ES,1430	= 122	2 122 821
INTPRFT	6042	994	239 208 1382	ISWRETRN	4707	592	2 563 753	JOG2TIF	ES,1430	= 821	1 801
INTPRFTX	31,3656	819	3 801 804	ITCTR	E7,1616	= 143	4 686 689	JETRATE	E6,1745	= 123	5 123 1415
INTPRFT1	23,2000	= 32	1 1042	ITEMP1	0061	95	71 95 1406	JETRATEC	E6,1746	= 133	3 1413 1461
INTPRFT2	12,2000	= 30	1 1093	ITEMP2	0062	95	32 95 1470	JETRATER	E6,1747	= 133	3 1413 1461
INTPSM	6053	994	1 1162	ITEMP3	0063	95	29 95 1468	JETSALL	16,3560	1420	1 1420
INTSTALL	13,3412	1211	38 220 1382	ITEMP4	0064	95	16 95 1316	JETSCHF	16,3446	1427	7 1421 1430
INTVAL	37,3065	390	2 384 386	ITEMP5	0065	95	50 95 1290	JETSON	17,3435	1453	
INTVFC	ES,1462	= 129		ITEMP6	0066	95	9 181 1468	JCESLEEF	5133	1097	8 275 1367
INTVEL	11,2000	= 29	1 686	ITERATOR	12,2536	1174	1 1187	JOBELR1	01,2777	1102	1 1097
INTWAKE	13,3423	1211	4 299 1208	ITERCTR	0026	= 1195	4 688 1175	JOBELR2	01,3010	1102	1 1104
INTWAKEC	04,3270	1217	1 1217	ITISMAK	10,3267	1258	1 1357	JCEWAKE	5137	1097	13 273 1368
INTWAKEM	04,3175	1217	1 1216	ITPENT1	32,3363	811		JCEWAKE2	01,3024	1103	1 1097
INTWAKEL	04,3147	1216	1 1364	ITRPNT2	32,3517	813		JCEWAKE3	01,3036	1103	2 1103
INTWAKEX	04,3212	1217	1 1217	ITR7	6372	1006		JCEWAKE4	01,3030	1103	1 1103
INTWAKEO	13,3421	1210	2 497 1217	ITR1	6362	1006		JOBXCFS	10,2775	1353	2 1346
INTWAKE1	13,3443	1211	4 711 1211	ITR10	6145	997		JCIN	10,3553	1364	1 1364
INTWAKLM	04,3210	1217	1 1217	ITR11	6205	998		JPARM	ES,1620	= 123	3 123 848
INTWAKUP	04,3214	1217	1 1216	ITR12	6137	997		JSWCHBIT	4736	= 65	
INTWAKUC	1166	= 1216	3 1216 1217	ITR13	6216	999	1 998	JSWITCH	0001	= 65	5 1229 1234
INTWAK10	1166	= 124	1 1216	ITR14	6242	1000		JTLST	17,3143	1446	2 1427 1445
INTY	ES,1470	= 129	6 386 387	ITR15	6126	997		JUMFESP	16,2206	1403	1 1400
INTYPRIT	4750	= 71		ITR7	6264	1001		JLSTCA	15,2042	250	1 251
INTYPLG	0070	= 71	19 455 1215	ITSAJCB	01,3636	1295	1 1294	JLSTOUT	16,3155	1423	1 1424
INTZ	ES,1474	= 129		ITSAJCB2	01,3747	1298	1 1296	JLSTTRIM	15,3017	960	1 964
INVERT	20,3704	1494	4 1488 1494	ITSATRL	01,2652	1295	1 1293	JLSTZY	15,2011	250	1 251
INVFLAG	36,2651	735	1 735	ITSAAVF	01,3552	1293	1 1293	J1PARM	ES,1550	= 123	2 123 827
INVSFGM	12,3127	1183	1 1183	ITSAAWT	01,3571	1294	1 1294	J2FAPM	ES,1554	= 123	2 123 827
IRETURN	E4,1502	= 115	8 115 1209	ITSEVEN	01,3753	1298	1 1295	J2REQSQ	13,2022	46	1 1226
IRETURN1	E7,1744	144	6 153 1216	ITSINGIR	5436	1294	1 1294	J4PEC/J3	13,2012	46	2 1226
IRIGCOMP	06,3336	329		ITSLGCL1	5445	1296	2 1296 1297	=====	=====	=====	=====
IRIGX	06,3264	330	2 329 335	ITSLGCL2	01,3710	1297	1 1297	K.C1	24,3675	657	1 657
IRIGY	06,3401	330	2 329 335	ITSLIKEB	01,2623	1295	1 1293	K(AT)	32,3754	830	1 827
IRISZ	06,3416	330	2 329 336	ITSLAGCL	01,3735	1297	1 1293	K(1/DV)	27,2014	39	1 827
IRIGI	06,3361	329	3 327 338	ITSNVAC	01,3646	1295	1 1295	KALCMAN2	22,2004	352	1 1321
ISCADP+0	4220	457	2 457 466	ITSWBIT	4735	= 77		KALCMON1	22,2000	= 32	4 352 366

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SYMBOL	DEF	F	REFERENCES	SYMBOL	DEF	F	REFERENCES	SYMBOL	DEF	F	REFERENCES
KALCMCN2	22,2001	=	32	KRDAP	E6,1506	=	123	LASINEX	00,3631	1076	1 1076
KALRCGN	07,3763	1321	1 1321	KSPACX	E6,1701	=	136	LAST	16,3331	1425	2 1425
KACS	16,2623	1417		KT	E7,1575	=	142	LASTPIAS	06,3671	327	1 852
KCENTRAL	E6,1741	=	133	KV1	E6,1703	=	136	LASTCHG	17,3174	1447	1 1447
KDPNDX	E6,1702	=	136	KV2	E6,1711	=	136	LASTLACW	E7,1745	=	152
KEEP-2	E7,1561	=	151	KV3	E6,1717	=	136	LASTLACT	25,3520	566	1 565
KEEPPRI0	10,2545	1349	2 1355 1359	K1	E6,1703	=	136	LASTNEG	21,2703	898	2 897
KEFPV0	34,3446	845	1 845	K1CPK2	34,2542	641	1 641	LASTCK	21,2653	897	2 897
KEFPVR1	34,3450	845	1 844	K1PACM	F5,1552	=	123	LASTPCSY	21,2665	898	2 897
KEL	E4,1630	=	117	K1VAL	27,2000	38	1 766	LASTSEG	07,3522	1314	1 1314
KFFCCNVC	12,2333	1170	3 1168 1169	K2	E6,1711	=	136	LASTTIME	01,3502	1124	
KFCF1	0042	=	1193	K2.	34,2561	641	1 641	LASTTPIF	E7,1757	=	152
KEPF2	0044	=	1192	K2CENTRAL	E6,1742	=	133	LASTXCMD	0113	=	96
KEPLFRN	12,2023	1156	2 1219	K2PARAM	F5,1556	=	123	LASTYCMD	0112	=	96
KEPLDOP	12,2166	1168	1 1169	K2THETA	E6,1737	=	133	LAT	1117	=	104
KEPPRFP	11,2414	1218	3 1208 1224	K2VAL	27,2002	38	1 767	LAT-LCNG	13,2351	1125	3 657 926
KEPPTA	E4,1512	=	115	K3	E6,1717	=	136	LATAZCHK	37,2021	374	
KEFZCRC	12,2006	=	1177	K3S1	22,2370	358		LATFWDV	21,2553	896	
KEYCCM	04,3245	1328		K3VAL	27,2004	38	1 767	LATITUDE	E5,1402	=	128
KEYFRTB	4060	155	2 154	K4	22,2372	358		LATLONG	12,2000	=	30
KEYRUPT	E4,2004	=	28	K4SG	22,2374	358		LATVEL	E7,1700	=	151
KEYRUPT1	04,3256	1328	2 154 155	=====	=====	=====	=====	LATVMETR	E7,1676	=	151
KEYTEMP1	0073	=	95	L	0001	=	92	LATVNEG	21,2757	895	1 898
KEYTEMP2	0332	=	95	L*WPR*1	0130	=	123	LATVPCS	21,2752	895	1 898
KIGNV/R4	E5,1504	=	122	L,PVI-CG	E6,1527	=	134	LAXIS	E4,1702	=	120
KIGNX/R4	E5,1500	=	122	LAFSAVE	E7,1714	=	152	LBUFF2	00,2470	1051	2 1075 1077
KIGNY/RP	E5,1502	=	122	LAG/TAL	E5,1542	=	123	LCFAN	0001	=	93
KILCLCFK	35,3560	680	2 680 681	LAGSLIST	4753	=	210	LDANZIG	00,3713	1077	1 1076
KILLADT	07,2060	246	4 246 261	LALOTCRV	13,2422	1127	1 926	LCATALST	0334	59	2 99 987
KILIPP	6041	743	1 743	LAMBERT	12,2212	1185	1 688	LCCLCF72	04,3654	1384	1 1384
KILLCLCK	36,2737	736	1 736	LAMPLCCP	12,3330	1186	3 1187	LDNDUMP	05,3717	985	1 989
KILLDEAD	27,2242	744	1 744	LAMENTER	12,2711	1176	1 1189	LCNDUMF1	43,3065	289	1 289
KILLMCN	41,3322	440	2 440	LAMPTEST	06,2766	182	2 171	LCNDUMF1	05,3720	989	1 989
KILITASK	6022	743	11 512 738	LANC	E7,1634	=	150	LCNPHAS1	05,3347	222	1 220
KILITSK2	27,2200	743	2 743	LANDALT	E5,1712	=	124	LCNPHAS2	05,3637	966	1 983
KILL2	04,2256	232	3 232	LANFCNST	22,2000	=	32	LCPCSMAX	12,2017	=	1153
KILMCON	4204	456	4 448 471	LANDISP	21,2145	891	4 823	LEACTIME	E7,1426	139	1 802
KLEFNEX	10,2333	1345		LANDJUNK	34,3271	784	1 234	LEFT	00,2342	1048	1 1045
KONMAT	05,2001	51	5 977 979	LANDLAT	E5,1706	=	124	LEFT-	00,2336	1048	1 1045
KPAPM	E5,1622	=	123	LANDLCNG	E5,1710	=	124	LEFTNCCM	40,3212	425	1 426
KPIP	33,2020	41	1 855	LANDTEMP	E7,1544	=	150	LEFT5	4331	462	5 415 1282
KPIP1	33,2021	41	5 811 880	LARGE	00,3065	1062	1 1062	LEGAL1	21,2105	829	2 824
KPIP1 (5)	21,2004	42	3 894 895	LARGE2	00,2112	1064	2 1062	LEGALIST	40,2527	405	2 405
KPIP2	33,2023	41	1 875	LARGE3	00,3074	1064	1 1062	LEMACCNF	01,2274	256	1 296
KQ	E6,1504	123	4 133 1480	LARMENT	5601	1371	1 1374	LEMACCNIC	13,3101	1205	5 340 547

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
LEMGEOM	13,2000	= 30	1 221	LMDSAS03	05,2145	= 201	1 201	LCADITIS	10,3462	1361	1 1358
LEMMASS	1326	= 107	21 195 1485	LMDSAS04	05,2154	= 201	1 201	LCADLV	41,3011	429	10 407 437
LEMDNM	1056	= 93		LMDSAS05	05,2157	= 201	1 201	LCADLV1	41,2001	407	1 275
LEMPPEC	13,3060	= 1205	11 27 568	LMDSAS06	05,2170	= 201	1 201	LCADSTAT	1013	102	4 429 460
LEMSTIFF	23,2421	= 697	1 697	LMDSAS07	05,2341	= 201	1 201	LOADTIME	10,3574	1367	35 208 1215
LENVFC	42,3066	= 289	1 263	LMDSAS08	05,2355	= 202	1 201	LOADSCENT	20,2011	43	1 1477
LENGTHTCT	05,1412	= 128	9 128 385	LMDSAS09	05,2224	= 202	1 201	LCC	0164	99	46 372 1363
LESCHK	05,3350	= 223	1 223	LMINT	24,3264	= 569	1 569	LCCCTR	0064	= 55	31 373 1357
LETAPRIT	4743	= 81	2 721 825	LMKACSN	06,1410	= 130	1 214	LCKKANGL	22,2402	358	1 252
LETABCPCT	1215	= 91	2 794 847	LMLSALCL	05,2357	= 203	1 206	LOCASN	14,2500	928	3 928 955
LETITILIV	27,2221	= 744	1 744	LMLSAL01	05,2127	= 203	1 203	LOCSKIRT	22,2744	= 365	7 354 356
LGCLCACP	01,3773	= 1298	1 1297	LMLSAL02	05,2136	= 203	1 203	LCCESCNT	20,2003	43	1 1477
LGCL2CGR	5307	= 1123	1 1123	LMLSAL03	05,2145	= 203	1 203	LCDMIXNA	42,2121	305	1 305
LGCOMP	06,3527	= 334	3 327 337	LMLSAL04	05,2154	= 203	1 203	LOCNLV	42,2137	305	1 305
LGCUPTCT	26,3401	= 590	4 581 586	LMLSAL05	05,2157	= 203	1 203	LCCNALCC	41,2113	409	8 408 429
LGRFT	57,1675	= 146	5 146 550	LMLSAL06	05,2170	= 203	1 203	LCDNNTAB	42,2103	305	1 409
LGWAKE	17,3276	= 1310	2 1317 1311	LMLSAL07	05,2276	= 203	1 203	LCEPFLF	12,2004	= 37	3 222 1191
LGYRO	1311	= 176	9 223 1314	LMLSAL08	05,2224	= 203	1 203	LCDPMAX	12,2017	1093	3 37 1193
LGYROBIN	43,2411	= 274	1 274	LMLSAL09	05,2226	= 203	1 203	LCDPMAX1	12,2021	1053	1 37
LIGHTSPT	05,3066	= 219	2 216 217	LMOMEGAN	06,1407	= 130	2 214 1415	LCCP174	04,3020	= 37	1 1129
LIM(-22)	27,3756	= 1273	1 1268	LMONLY	16,2462	= 1415	1 1415	LCDSANPT	4400	464	3 440 1329
LIMLARM	26,3675	= 556	2 594	LMCCNBIT	4741	= 79	1 214	LOENERGY	12,3452	1188	1 1187
LIVITCCM	42,3334	= 424	1 424	LMOONFLG	0174	= 79	5 37 1203	LCGSUB	30,3023	851	1 840
LIMITS	4734	= 1087	10 916 1463	LMCRBMCL	05,2066	= 195	1 205	LMKONBIT	4747	= 66	1 553
LIMITSUB	30,3714	= 917	7 907 912	LMCRBMCL1	05,2127	= 195	4 195 203	LCKKNSW	0012	= 66	5 271 512
LINRAT	17,2373	= 1436	2 1436 1437	LMJPRM02	05,2136	= 195	6 195 205	LCLIM	12,3513	1189	2 1186
LINDATP	16,3173	= 1423	1 1424	LMCRBM03	05,2145	= 196	6 195 205	LCMAT	25,3257	677	2 674 675
LINUS	5464	= 1362	2 477 513	LMCRBM04	05,2154	= 196	6 195 205	LCNG	1121	= 104	7 104 1127
LINUSCHR	10,3375	= 1360	2 1348 1349	LMCRBM05	05,2157	= 196	6 195 205	LCNGBASE	1150	104	2 1251 1297
LITIT	25,3614	= 615	1 615	LMCRBM06	05,2170	= 196	3 195 203	LCNGCACP	1146	104	2 1123 1124
LMAGSICL	05,2407	= 205	3 194 205	LMPCS	04,1751	= 119	3 502 569	LCNGCALL	5277	1122	5 375 1298
LMAGSI02	05,2136	= 205	1 205	LMRENDCL	05,2232	= 199	1 205	LCNGCLCL	01,3730	1257	2 1257
LMAGSI03	05,2145	= 205	1 205	LMREND01	05,2127	= 199	1 199	LCNGCYCL	01,3467	1123	2 1123 1124
LMAGSI04	05,2154	= 205	1 205	LMREND02	05,2136	= 199	1 199	LCNGEXT	03,1434	110	4 1123 1124
LMAGSI05	05,2157	= 205	1 205	LMREND03	05,2145	= 199	1 199	LCNGGYC	07,3535	1314	1 1313
LMCSTACL	05,2172	= 197	2 194 205	LMREND04	05,2154	= 200	1 199	LCNGPCCF	01,3522	1124	2 1123
LMCSTAC1	05,2127	= 197	1 197	LMREND05	05,2157	= 200	1 199	LCNGPTRN	01,3507	1124	1 1124
LMCSTAC2	05,2136	= 197	1 197	LMREND06	05,2224	= 200	1 199	LCNGTIME	1152	104	13 1122 1257
LMCSTAC3	05,2145	= 197	1 197	LMREND07	05,2276	= 200	2 199 203	LCKKANGL	07,1667	= 151	1 800
LMCSTAC4	05,2154	= 197	1 197	LMTRAP	06,1406	= 130	2 213 1415	LCCPCT	07,1605	= 142	5 636 644
LMCSTAC5	05,2157	= 197	1 197	LMVFL	04,1757	= 119	3 502 569	LCCFER	17,3034	1444	3 1439 1445
LMCSTAC6	05,2224	= 197	3 201 203	LMCHTM	07,1660	= 149	3 149 497	LCCPMX	34,2057	635	1 636
LMCSTAC7	05,2226	= 197	2 197 203	LMCCALL2	01,3453	= 1123	1 1123	LCCPRATE	16,3674	1460	2 1460 1461
LMDSASFL	05,2203	= 201	1 205	LCADDAP	26,2000	= 31	1 293	LCCFSIN	22,2417	358	1 359
LMDSAS02	05,2136	= 201	1 201	LCADDAP1	01,2000	= 28	2 43 295	LCCP1	22,3720	1254	1 1253

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LOOP2	23,3717	1253	1 1254	LRALPHA2	25,1524	= 123	1 123	LRVELY	25,3106	555	1 493
LOOP3	20,2734	1480	2 1481	LRALT	25,3102	= 555	2 493 886	LRVELZ	25,3104	555	2 493 555
LOOSE	37,2737	387	1 388	LRALTBIT	4747	= 86	1 615	LPVF	25,1527	= 123	3 123 881
LOSCALAR	0004	= 53	6 382	LRALTFIC	1276	= 86		LRVJOB	33,3560	885	1 882
LOSCMBIT	4740	= 65	4 554	LRBETA1	25,1523	= 123	1 123	LRVMAX	25,1526	= 123	3 123 881
LOSCMFLG	0041	= 65	10 498	LRBETA2	25,1525	= 123	1 123	LRVTIMDL	24,1737	= 120	2 201 885
LOSCOUNT	27,1455	= 140	39 184	LRBYBIT	4735	= 83	7 230 865	LRVTIME	24,1652	= 117	7 117 887
LOSCSFSC	27,1711	= 145	6 145	LRYPASS	0245	= 83	1 778	LRWF	27,1421	139	1 878
LOSSM	1100	= 607	3 601	LRFGCHK	04,2762	702	1 701	LRWVFF	25,1536	= 123	2 123 882
LOSVCT/4	23,1760	= 607	5 601	LRFSC	20,2673	1479	1 1478	LRWVFX	25,1535	= 123	1 123
LOSVFC	25,1413	= 128	3 128	LRHEIGHT	25,2272	558	1 558	LRWVY	25,1534	= 123	1 123
LOSVFL	23,1760	113	6 113	LRFJOB	34,3571	886	1 867	LRWVFZ	25,1533	= 123	2 123 881
LOSI	25,1444	= 128		LRHMAX	27,1420	139	2 878	LRWVX	25,1532	= 123	1 123
LOSP	25,1452	= 128		LRHTASK	21,2125	867	1 823	LRWVY	25,1531	= 123	1 123
LOTHIN	1124	= 96		LRINH	0254	= 84	3 272	LRWVZ	25,1530	= 123	2 123 881
LOTHMCUT	1007	= 101	1 425	LRINHBIT	4744	= 84	2 878 881	LRXCDL	24,1654	= 117	5 117 887
LOTHRLST	33,2352	857	1 856	LRICTR	27,1670	= 151	5 151 889	LRXCDLCL	24,1734	= 120	3 120 885
LOUNITX	12,2004	= 37		LRMCTR	27,1672	= 151	5 151 889	LRXCCL	24,1655	= 117	2 117 879
LOUNITY	12,2002	= 37		LRQFF	42,2360	272	1 262	LRXCCLCL	24,1735	= 120	1 120
LOUNITZ	12,2000	= 37		LRQCN	42,2317	271	1 262	LRZCDL	24,1656	= 117	4 117 887
LOUPE	21,3612	1474	1 1473	LRQCSALM	22,2543	877		LRZCCLCL	24,1736	= 120	3 120 885
LOWPBIT	25,1506	= 122	3 122	LRQCSBIT	4746	= 86	1 565	LRDISP	14,2454	926	1 926
LOWFCCLD	31,2220	787	1 787	LRQCSCL	42,2673	280	2 277	LRCPINT	04,2775	975	2 925 968
LOWIDCCC	15,2065	194	1 989	LRQCSCLM	25,3526	566	1 565	LRFCIS	15,3647	977	4 928 1228
LOWLOAD	10,3527	1362	1 1358	LRQCSFLG	0275	= 86		LRSP2.2	26,2416	579	2 508 589
LOWSUPER	30,2000	= 34	8 211	LRQCSNXT	25,3475	565	2 565 566	LRSP2.4	26,3200	587	1 579
LOWVFFR	41,2034	408	1 408	LRQCSCLT	40,2635	419	1 418	LRSTBKCT	43,3744	1283	1 1282
LOWWIO	5012	1089	21 233	LRQCSZ	25,3454	565	2 265 888	LRSTLM	4747	= 744	1 744
LOWW1	4356	463	7 157	LRQCSZK	42,2145	265	1 262	LRSTFTM	0144	= 97	
LOW2	6250	= 1091	1 1045	LRQ2ALM	42,2154	265	1 265	LRST1	23,1400	110	48 155 1293
LOW3	4757	= 1091	2 233	LRQCTR	27,1671	= 151	4 151 889	LRST2	23,1410	110	41 221 1120
LOW4	4762	1087	2 727	LRQSTR	22,3652	888	1 888	LRST2CCN	41,2145	409	1 409
LOW5	4346	463	16 400	LRQCK	25,3420	561	1 561	LRST2FAN	42,2002	262	2 262 468
LOW7	6077	995	14 229	LRQCTR	27,1673	= 151	4 151 889	LRST2X	23,1757	113	4 571 569
LOW7+2K	5013	1089	1 1081	LRQ22	32,2000	= 34	2 41 573	LRTHVACA	05,3353	223	4 222
LOW8	4257	463	21 162	LRQ22.1	22,2366	573	1 507	LUNARIT	4740	= 70	
LOW9	5004	1088	12 245	LRQ22.1X	27,1737	= 147	6 147 577	LUNAFLAG	0060	= 70	9 656 1131
LRQ22FCS	12,2006	= 37	5 244	LRQ22.2	24,2333	576	1 507	LUNDESCH	25,2432	541	1 323
LRQ22BIT	4746	= 84		LRQ24.1	26,3442	561	2 518 595	LUNG	15,2666	958	2 956 957
LRQ22FLG	0256	= 84	1 888	LRQ24.11	26,3471	562		LUNLANAC	36,3142	741	1 731
LRQ20.1	24,3255	569	5 498	LRQ21	0011	= 92		LUNLAND	31,2410	752	1 741
LRQ20.2	25,3550	570	1 498	LRVEL	25,3116	555	1 885	LUNFCS	15,3647	= 977	2 489 1230
LRADPFT	27,1650	= 150	4 151	LRVELEIT	4744	= 86		LUNRSALN	0005	= 236	2 236
LRADPFT1	27,1656	= 151	2 889	LRVFLFLG	0273	= 86		LUNSFCHK	24,2670	509	9 494 518
LRALPHA	25,1522	= 122	3 123	LRVELX	25,3110	555	1 493	LUNSPF	11,3417	1230	1 1228

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
LV	0744	=	93	2 1062 1064	MARKCTR	E7,1462	= 140	5 458 711	MAXTEST	00,2565	1053 4 1052 1066
LVRUF	6276		1002	1 1026	MARKEBAN	1070	103	1 1362	MAXTFF	27,3651	1270 1 1269
LVLB145	25,2000		41	1 558	MARKEND	10,2326	1344	1 1344	MAXTFF1	27,3650	1270 1 1267
LVLIMITS	21,2721		898	4 897	MARKFLAG	1070	= 1262	1 1346	MAXTRIES	24,2310	501 2 511 512
LVMINLM	21,3011		899	6 898 899	MARKFMSK	10,3032	1354	2 1345	MAXTRYS	25,2505	544 1 545
LVSQUARE	0042	=	93	2 1062 1067	MARKFORM	10,2340	1345		MAXV8ITS	21,2005	42 8 897 899
LVWTLST	5215		1111	1 1115	MARKNV	3070	100	5 1346 1355	MAX250	35,3642	684 1 667
LXA	01,2355		1079	1 1004	MARKOCT	10,3533	1363	1 1353	MCTOMS	25,3100	554 2 550 553
LXC	01,2361		1079	1 1004	MARKOVER	10,2422	1361	1 1344	MCTT	E7,1736	= 144 2 144 767
L14/OUT	46,2745		421	2 421 421	MARKFEFF	10,2441	1347	1 1357	MDOTAPS	36,2010	38
=====					MARKPLAY	10,2400	1346	4 1346 1362	MCTDPS	36,2002	38 1 827
M/SCCN1	42,3377		425	1 424	MARKRFT	10,2414	1360	1 1359	MP1	4362	463 4 460 1381
M/SCCN2	42,3400		425	1 424	MARKRFT	07,2332	254	2 154 155	MEASINAC	23,2000	= 32 1 1141
M/SCCN3	42,3402		425	4 424	MARKSTAT	1307	106	34 223 261	MEASINAC1	23,2000	= 32 1 1145
M/SLIMIT	42,3326		424	2 424	MARKTEST	26,2510	580	1 579	METHCD1	22,2242	355 1 355
M/SONRM	42,3342		424	7 424 425	MARKTYPE	07,2514	258	5 255 260	METHCD2	22,2216	355
M/SCUT	42,3313		423	1 418	MARKWAKE	10,3024	1354	1 1361	METHCD3	22,2266	356 2 355
MAGSUB	4512		523	9 525 546	MARK2PAC	1072	103	2 1354 1355	MFI	E4,1630	= 117 12 252 354
MAGVFC2	F5,1717	=	126	6 124 1189	MARKRMSK	10,3506	1362	2 1345	MFISYM	E6,1703	= 136 12 254 256
MAINFAC	31,2427		839	1 839	MARK4MSK	10,3507	1362	1 1345	MREF	15,3445	970 2 973 974
MAINLINE	36,2710		842	2 844	MARSLFFP	10,3455	1361	1 1346	MFS	E4,1630	= 117 5 117 352
MAJ+	07,3461		1313	1 1312	MASKREG	F5,1534	= 128		MCARET	30,3262	907 1 517
MAJ-	07,3461		1316	1 1312	MASS	1243	= 105	18 105 1485	MGC	E5,1743	= 124 3 125 1243
MAKFAOCS	27,2513		854	2 853	MASSCTR	0161	= 1486	5 1484 1485	MGLVFEIT	4752	= 75
MAKFCADF	4645		991	16 271 1476	MASSFIX	20,2517	1477	3 1477	MGLVFLAE	0130	= 75 2 692
MAKFCFA	10,3540		1363	1 1351	MASSMCN	32,2233	855		MG2	07,2720	= 1320 1 1320
MAKFMARK	11,2365		1345	1 1349	MASSMLT	21,2326	789	2 786	MICAVRIT	4752	= 81
MAKFMAX	21,3133		1483	1 1483	MASS1	E7,1570	= 148	5 148 855	MICAVFLG	0224	= 81 3 1215 1233
MAKFPPLAY	10,2547		1349	3 1348 1363	MATINC	0140	97	9 97 1031	MIDCGIM	06,2000	= 29 1 692
MAKFPRTC	10,2513		1348	1 1349	MATMOVE	14,3271	541	7 937 967	MICFLAG	0002	= 65 5 1209 1236
MAKFRLET	7757		1449	2 1448 1449	MATFIX	11,3201	1228	2 1225	MICFLBIT	4737	= 65
MANFLAG	16,2202		1403	1 1402	MAX	0016	= 1195	4 1174 1175	MIDCRLST	17,3163	1447 1 1446
MANMCFD	16,3127		1420	1 142	MAXANG	22,2364	358	1 353	MICTCAV1	13,3555	1214 1 726
MANUCALL	22,3177		368	1 368	MAXCHECK	12,2625	1175	1 1175	MICTQAV2	13,3551	1214 1 751
MANUFRT	4736	=	77		MAXCHK	22,3636	721	4 620 720	MIC1FRIT	4751	= 81
MANUFLAG	0152	=	77		MAXCOEA	12,3202	1186	2 1186	MTDIFLAG	0223	= 81 4 1214 1216
MANUCFF	22,3113		367	1 367	MAXCR	05,3065	219	1 213	MIC2	13,3650	1215 1 1215
MANUSTAL	22,3167		367		MAXOT	13,3342	1210	2 1209	MIC5	4347	462 1 430
MANUSTAT	22,3122		367	1 360	MAXEV	09,2642	1057	1 1052	MID7	4144	441 4 441 1362
MANLSTOP	22,3213		370	1 367	MAXCVSW	0140	= 97	6 1049 1064	MIMRET	17,2341	1435 1 1435
MANUVER	26,2000	=	33	1 475	MAXFOPCE	E5,1546	= 123	2 123 813	MIN	0010	= 1195 4 1174 1175
MANUVER1	26,2000	=	33	1 485	MAXJETS	17,3373	1452	1 1452	MIN+	07,3456	1313 1 1312
MARKCHEX	07,2716		252	2 252 261	MAXNM	22,3645	721	3 721	MIN-	07,3576	1316 1 1212
MARKCTR	07,1551	=	146	13 146 261	MAXPLUS	21,3041	1483	2 1482 1483	MINARDV	33,2202	850 1 836
MARKCOP	1,2414		1346	1 1346	MAXPA	27,3461	1264	2 1264	MINADR	17,2350	1436 1 1435

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MINANG	22,2362	356	1 353	MKV854	07,2617	260		MCCNGCN	22,3516	717	1 717
MINP12	7744	=	987	MKV854	07,2616	260	1 260	MCCNMXX	24,3727	1135	2 1132 1134
MINP1214	06,3552	984	1 984	MKV854*	07,2621	260	1 252	MCCNMXA	25,3633	1126	1 1136
MINCHFRK	12,2571	1174	1 1174	MLOSV	03,1766	113	6 550 607	MCCNCTH	0173	=	37 2 298
MINCOGA	12,3320	1186	1 1189	MMACREF	41,2033	407	1 407	MCONPAD	22,3373	715	1 714
MINCON	42,3340	437	1 436	MMATRIX	0024	=	1140 8 1132 1228	MCONRATE	27,2026	44	1 824
MINCON1	42,3275	423	1 426	MMCHANG	41,3436	449	2 407 410	MCCNSFCT	33,2254	855	1 855
MTACCN2	42,3273	423	2 423	MMDSFLAY	5315	1284	1 218	MCCNTHS	0174	=	37 6 298 1212
MINCSM	4741	=	47	MMMLMPFR	0774	101	1 228 829	MCRECACR	20,2461	1410	1 1410
MINDEX	1773	171	4 229 233	MMTEMP	1057	=	234 3 233	MCREDES	25,2637	548	2 548
MINFORCE	05,1544	=	123 2 123 813	MKEYIN	0015	=	93 2 219 132E	MCREICLE	16,2157	1403	3 1400 1401
MINIMP	43,3021	285	1 263	MCDABCR1	07,3733	1320	3 1320 1321	MCRNU*	4,2312	402	2 401
MINIRFCT	13,3777	1231	3 497 1213	MCDQONE	12,2124	1167	3 1167	MCVATHIS	13,2750	=	37 1 1213
MINLMD	01,2000	42	1 256	MDE	0163	99	37 327 1363	MVFEACSM	13,2675	1202	3 1149 1202
MINMINLM	01,2001	43	1 256	MDEA	1106	=	103 4 324 541	MVFEALEM	13,2750	1203	4 37 1203
MINPERF	22,3365	715	2 714 717	MDEP	1110	103	4 103 544	MVFEPCSM	13,2724	1202	3 1149 1202
MINPERM	22,3367	715	1 717	MDEFCACR	1301	106	11 106 1320	MVFEPLEM	13,2771	1203	3 1148 1203
MTAGE	17,2320	1435	2 1435	MDEFFXIT	07,2747	1301	8 1300 1320	MPAC	0154	99	928 98 1496
MINOTA	17,2325	1435	1 1436	MDEGCGC	07,3723	1320	1 1320	MPAC+	00,2437	1051	2 1050
MINTTVES	16,3625	1421	1 1427	MDESLP	07,3727	1320	1 1320	MPAC+6	00,162	=	421 7 421 464
MINTTVF2	15,3517	984	1 984	MDESW	07,2000	=	29 1 1300	MPAC-	00,2433	1050	2 1050
MINUS1	7752	=	1061 2 1313 1361	MDE2CHK	4550	525	2 524 546	MPACSEF	00,2033	1039	2 1047 1068
MINUS2	7751	=	1298 3 22 1293	MDE70	05,3463	826	1 825	MPACSEFAC	00,2050	1040	1 1039
MIS	06,1646	135	20 136 485	MDE71	05,3465	826		MPACTST	42,3554	437	1 436
MISCJUMP	6337	1004	1 1001	MDCNGDEL	12,2600	1174	2 1174	MPACVFLF	7535	1035	5 604 1252
MIXAD	41,2261	411	1 411	MDCPSDEL	12,2636	1175	2 1175	MPAC2SAV	0165	=	1362 2 1346 1355
MIXBACK	40,3103	434	1 434	MDCRF	1010	101	23 213 1378	MPERFMSK	10,3521	1362	2 1345
MIXPR	0140	=	97 13 305 435	MDCRQLTB	04,2040	=	449 1 449	MPTMF	0135	97	64 57 1078
MIXCCN	4771	=	305 1 305	MCONADR	40,3474	448	1 448	MR.KLEAN	05,2641	214	2 213 1373
MIXNN1	41,2234	411	1 411	MCONBACK	41,3356	441	1 441	MRKIDBIT	4735	=	72
MIXNN2	41,2246	411	1 411	MCONBUSY	41,3357	441	1 440	MRKIDFLC	0074	=	72
MIXACLN	41,2221	411	1 408	MCONDEL	41,3326	440	1 440	MRKNVBIT	4743	=	72 1 1345
MIXTEMP	0125	=	96 2 405 411	MCONC	41,3327	440	1 440	MRKNVFLC	0102	=	72 1 1356
MKABCF1	07,2144	245	1 244	MONITOR	41,3236	439	7 405 410	MRLPTBIT	4747	=	73
MKALAPM	07,2325	253	1 252	MONIT1	41,3240	439		MRLPTFLC	0106	=	73
MKDEX	07,1552	=	146 9 146 261	MONIT2	41,3253	439	2 439	MSKCATR1	20,2021	254	1 294
MKCVBIT	4751	=	73 2 1347 1354	MONREF	41,3355	441	1 441	MSTCRE1	01,2370	1079	2 1080 1083
MKOVFIAG	0110	=	73	MCONPECS	06,3115	188	1 188	MS100	7732	=	1402 2 1402 1411
MKPEJ	07,2461	257	1 254	MCONPEG	41,3322	440	2 440	ML(P)	0032	=	1238
MKREFLEAS	07,2047	245	1 253	MCONSAVE	1017	102	7 223 441	MUJA	07,1720	=	144 4 144 770
MKPUPTRP	4061	155	1 154	MCONSAVE1	1020	102	12 223 467	MUASTEER	07,1716	=	144 5 144 771
MKTIME	07,1754	=	147 8 147 886	MCONSAVE2	1021	102	4 435 454	MUCHTIME	01,3512	1124	2 1123
MKVAC	07,2014	244		MCONBIT	4740	=	65	MLEAPTH	13,2006	46	8 687 1236
MKVACEND	07,2021	244	5 244	MCONCNTR	14,2535	528	1 528	MLLRUSH	21,3460	1471	1 1471
MKV852	07,2621	260		MCONFLAC	0002	=	65 31 656 1236	MLLTXIT	5620	1372	

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XX MISCELLANEOUS TROUBLE

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MUM	13,2004	46		NEARCNE	27,3770	1273	4 835 1270	NEG2	7751	1090	11 231 1471
MUM(-27)	27,2024	44	1 848	NEEDLBIT	4750	= 66	1 1405	NEG3	7750	1090	7 883 1433
MUMFLAG	1141	= 76	8 230 862	NEEDLER	27,2336	1408	1 1405	NEG4	6115	956	2 1000 1276
MUMFLBIT	4744	= 76	4 187 860	NEEDLER2	27,2367	1408	1 1408	NEG5	41,2115	405	
MUMCP?	37,3377	707	1 703	NEEDLES	20,2407	1409	1 1409	NEG7	5650	= 233	2 246 548
MUMGRAV	33,3067	876	7 726 878	NEEDLESS2	20,2376	1408	1 1408	NETNEG	20,3744	1454	1 1494
MUMPRETN	23,2461	865	1 876	NEEDLE11	20,2350	1408		NETZFRG	6124	957	
MUMFVC	33,3025	875		NEEDLFLG	0013	= 66	3 266 475	NEWAGS	32,2014	208	1 208
MUSCALE	27,1766	= 144	2 77	NEED2BIT	4735	= 65	1 1405	NEWANGL	22,3007	366	1 365
MUTAEFL	74,2104	45	6 65 1185	NEED2FLG	0000	= 65	3 266 475	NEWANGLE	25,3712	1137	4 1135 1138
MWATITBIT	4741	= 72		NEG	6744	1017	4 1017	NEWATA	21,2304	893	1 892
MWATITFIG	0100	= 72		NEGATE	21,3314	1466	1 1466	NEWDEL	12,2634	1175	2 1174 1175
MX	F7,1676	= 146	6 146 584	NEGCHPCK	21,2656	1498	1 1495	NEWDELFI	22,3003	366	1 365
MXVYMZ	26,2763	583		NEGCHS	13,2532	1129	1 1129	NEWDFLX	12,2260	1169	3 1169
MXM3	22,2312	357	4 352 484	NEGDRIVE	21,3564	1473	1 1473	NEWIRIT	4727	= 76	
MXV	7337	1030	1 1030	NEGSDOT	17,3320	1451	1 1451	NEWIFLG	0172	= 79	3 1206 1210
MY	F7,1704	= 146	5 146 590	NEGFIPE	21,3710	1499	1 1495	NEWJOB	0067	95	22 222 1283
MZ	F7,1712	= 146	3 146 584	NEGFNCT1	21,3223	1464	1 1464	NEWLIST	35,3530	984	2 983 584
M11	F6,1414	130	9 155 1428	NEGFNCT2	21,3235	1465	1 1464	NEWLOAD	30,2160	832	1 832
M21	F6,1415	130	4 150 1441	NEGFLMV	21,2766	899	1 898	NEWLOC	0065	= 95	5 1055 1103
M22	F6,1417	130	7 189 1441	NEGMAX	4735	= 1051	13 368 1483	NEWMODE	6063	955	6 1011 1388
M31	F6,1416	130	4 190 1441	NEGONE	7752	1050	15 220 1465	NEWMODEA	5314	1284	2 233 378
M32	F6,1420	130	5 190 1441	NEGOLT	13,2540	1129	1 1129	NEWMODEX	5311	1284	7 374 1384
=====	=====	=====	=====	NEGP	12,3427	1187	3 1186 1187	NEWPCS	6073	995	1 994
NAPPOWCB	20,2151	1398	1 1397	NEGPROC	27,3146	772	1 772	NEWPAR	14,2725	932	1 932
NAVKEYIN	0116	= 93	6 219 255	NEGSGN	47,2374	403	1 400	NEWPHASE	31,2347	751	1 795
NBCONLY	36,3563	335	1 1113	NEGSHAFT	25,2601	546	1 546	NEWPOS	F7,1652	= 149	4 145 457
NBDX	F3,1461	110	6 327 1113	NEGTFE	27,3645	1270	2 1269	NEWPPID	0063	= 95	12 233 1351
NBCY	F3,1461	110	2 329 336	NEGTHRST	21,3761	1500	1 1495	NEWSTATE	12,2653	1176	1 1178
NBDZ	F3,1462	110	2 329 336	NEGTCRK	16,3736	1461	1 1460	NEWTN	34,2702	643	2 643
NBD2	06,3610	335	1 327	NEGTCRKL	E6,1516	= 134		NEWVEL	F7,1644	= 149	3 145 457
NBD3	26,3614	335		NEGTOPKV	F6,1520	= 134		NEWZCCMF	22,3711	1149	1 1143
NBPQSPCL	37,2012	274		NEGTCRKP	E6,1514	= 133		NEXTCCL	07,3052	1303	4 1303 1304
NBPANCH	11,3264	1228	4 1225 1236	NEGTCVFL	12,2330	1170	1 1170	NEXTCCL	11,3571	1233	2 1234
NBUSMASK	10,3514	1362	1 1350	NEGUDU	F6,1501	123	11 122 1473	NEXTCCRE	01,2675	1099	2 1098
NBINE2	23,2515	= 37		NEGUR	E6,1503	= 123	4 1401 1466	NEXTES	35,3123	670	1 665
NB2CDLSP	30,3520	913	1 907	NEGUSLM	21,3557	1473	3 1466 1473	NEXTIME	E6,1706	= 136	3 368 369
NCDU	F6,1703	= 136	3 366 367	NEGVMXY	21,2711	898	2 898	NEXTINCL	05,3535	984	1 984
NCOAPSE	14,3603	945	4 937 966	NEGU	4754	1087	27 158 1447	NEXTINSL	05,3665	984	1 984
NCSMVFL	37,1664	= 149	2 497	NEG1	7752	= 1051	5 327 1051	NEXTLINE	22,3507	717	1 717
NDCMPTST	41,2440	416		NEG1/2	4734	1087	6 221 1120	NEXTTP	E6,1472	131	7 131 1420
NDCFLW	F6,1650	= 137	6 127 912	NEG1/3	21,3234	1465	2 1465	NEXTU	E6,1473	= 131	5 1395 1433
NDCXCHCF	12,2240	1169	2 1169	NEG100	5172	1108		NEXTV	E6,1474	= 131	5 1395 1434
NDCXCTP	F5,1414	= 128	7 129 377	NEG12	07,3733	1078	3 1046 1066	NCLICSLB	E7,1647	= 151	3 752 805
ND1	4361	463	7 272 885	NEG18C	40,2122	434	1 434	NCKELCP	34,2077	635	1 638

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NIGALCCF	E7,1646	=	151	3	779	805	NOLDRBIT	4742	=	84	3	867	877	NCSSHIFT	10,3771	1392	6	1391		
NINF	4320	=	1091	2	1492		NOLDRREAD	0252	=	84	1	888		NOTALLCW	21,3410	1470	2	1469		
NJFTSPIT	4735	=	67				NOMCALST	05,2172	=	194				NCTBIT12	40,3736	473	2	473		
NJFTSFLG	0117	=	67	1	743		NOMINIMP	42,3024		286	1	263		NCTHREIT	4740	=	74	1	731	
NN	E7,1466		141	7	199	673	NOMPRF	25,3206		557	2	557	562	NOTHPTCL	0116	=	74	5	747	778
NNADTAE	42,2154		306	1	345		NOMTPI	E4,1716	=	118	9	630	677	NOTIME	13,3660	1216	2	1214	1215	
NNADTEM	0146		57	8	305	432	NOMAVKEY	05,3100		219	2	216	215	NCTMIN	17,3061	1444	2	1444		
NNTYPTAP	42,2320		305	1	345		NOMPI	35,3260		673	1	673		NOTMUCH	20,3436	1490	1	1488		
NNTYPTFM	0147		97	5	305	431	NOMQBSM	5274		1121	1	1418		NCTPLAN	15,2521	954	1	954		
NO.CORCS	01,2635		1098	2	1098	1103	NOMQSSM	5272		1121	1	1449		NOTP20	25,3051	554	1	553		
NO.PJFTS	E6,1521		134	2	134	1460	NOMRATES	30,2503		840	1	840		NCTSHIFT	24,3321	569	1	569		
NO.UJFTS	E6,1522	=	134	3	134	1460	NOMRBACK	40,3105		434	1	434		NOTWCSM	26,2450	579	1	579		
NO.UJFTS	E6,1523	=	134				NOMRESTAL	25,2467		543	3	541	544	NOTWIFM	26,2502	580	1	580		
NO.WDS	6247		1000	5	1000	1065	NOMRFSN	33,3205		878	1	877		NCLLLAGE	36,2657	735	4	733	753	
NC.9	36,3667		755	1	754		NOMRFSFT	07,3422		1311				NCLN	40,2370	403	1	400		
NO-ATP	30,2663		842	1	842		NOMRFINAL	13,3301		1209				NCUNACC	0145	=	57	25	411	462
NO-INT	13,2063		237	1	237		NOMRLITE	23,3534		883	2	883		NCUNCACP	1016	102	9	408	462	
NOADJUST	42,3721		490	1	490		NOMRWAER	42,3471		425	1	424		NCUNREG	1001	101	15	223	460	
NOAOS	20,3457		1450	1	1450		NOMRVAL	01,2340		297	1	295		NCUNTEM	0122	=	56	3	411	
NOATTCTAT	30,3735		917	3	915	908	NOMRMANCH	10,2062		1355	1	1361		NCUNTEST	41,2462	416	2	427	428	
NOATTCTCF	07,3240		1307	4	166	1306	NOMRNFEX	E7,1463		141	19	141	657	NOUPDCCWN	43,3073	250	1	289		
NOBITS	E5,1442	=	128				NOMRNFEXIT	22,2532		575	1	575		NCLPF8IT	4746	=	68	1	507	
NOCHG	35,3542		675	1	679		NOMRNGAN	E4,1503	=	115	7	115	1150	NCLPFLAG	0030	=	66	2	250	
NOCDOT	26,2004		52	1	1135		NOMRNLIZ	23,2000	=	32	1	861		NCUT	1015	102	9	158	465	
NOCEPNE	25,2544		545	1	545		NOMRNLIZE	23,2463		862	2	242	852	NCLTCCN	4760	=	1091	1	223	
NOCEPVM	25,2502		544	2	541	544	NOMRNLIZ1	33,2415		862	1	862		NCLVFAL	04,2312	232	1	230		
NOOIO	26,2012		52	1	1135		NOMRNLIZ2	33,2420		862	1	862		NCVAC	5072	1095	32	155	1401	
NODCPIT	4753	=	70	3	228	1374	NOMRNLQP	37,2604		286	1	286		NOVACADR	01,3776	1298	1	1295		
NODCPFIAG	0154	=	70	6	208	1327	NOMRNRFT	10,3430		1361	2	1359		NOVAC2	01,2626	1058	1	1055		
NODSPCUT	06,2120		161	2	158		NOMRNSPIT	4742	=	77				NOVAC3	01,2631	1058	1	1059		
NODSPY	06,2152		161	1	161		NOMRNSCL	16,2620		1431				NOVWRRT	35,3334	675	1	676		
NODVMCNI	33,2342		857	1	856		NOMRNSW	0156	=	77	8	687	1180	NOV37VM	04,2466	236	1	228		
NODVMCM2	33,2346		857	1	856		NOMRNTMT	1044	=	102	3	939	1352	NOMWATX	32,2257	496	1	496		
NOMFRANK	43,3403		1278	1	1279		NOMRNTST	00,3512		1073				NOM118IT	4751	=	64	1	869	
NOMEND	25,3263		558	1	558		NOMRNT4	06,2007		156	2	156		NC511FLG	0261	=	64	1	888	
NOMIMLFC	22,2744		365	1	365		NOMRUNIT	10,3727		1351	11	340	1351	NPTRAPS	E6,1433	=	130	4	1402	1415
NOMIMRUN	06,2462		171	2	170		NOMRUX1	10,3725		1391	3	585	765	NOTRAPS	E6,1434	=	131	4	1402	1416
NOMCO	22,2732		364	3	364	366	NOMRWAKE	10,3334		1359	1	1361		NOMVAG	0000	=	1258	4	1261	1268
NOMGRIL	27,3212		773	1	773		NOMRWZI	0044	=	1150	12	1145	1150	NRMIDBIT	4737	=	72			
NOMGUFSS	12,3477		1188	1	1186		NOMRPTAT	17,3026		1444	3	1443	1448	NRMIDFLG	0076	=	72			
NOIPAKSW	0166		995	1	1036		NOMRPMON	06,3126		188	6	184	188	NRMNVBIT	4744	=	72			
NOMINT	12,2654		1201	1	1200		NOMRREBIT	4750	=	75	2	187	221	NRMNVFLC	0103	=	72	1	1356	
NOMKILL	43,3132		291	1	292		NOMRMCN	0126	=	75	8	270	516	NRTERM	0020	=	1258	2	1267	
NOMLITE	33,3551		884	2	883		NOMR29FLG	0061	=	70	2	843	858	NRTRAPS	E6,1435	=	131	4	1402	1417
NOMLOKCN	23,2026		271	1	271		NOMR29NCW	33,2573		871	6	599	871	NRUPTBIT	4750	=	73			

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NRUPTFLG	C107	=	72	NWAITFLG	C101	=	72	CCT16	4317	=	1065 1 1065
NR298RDR	5114	=	558	NRXAX	15,2420	552	1 551	CCT1601	37,3054	389	1 389
NR25F8IT	4741	=	70	NRXPCSVEL	31,2137	612	1 613	CCT1720	06,3000	182	1 178
NRAMP	1110	=	102	NRXTPAK	43,3654	1282	2 291	CCT176	00,2126	1042	2 1048
NSRCHFAT	37,1736	=	145	NRXTF133	06,2432	169	7 178	CCT177	6077	=	1298 1 1295
NSTEER	36,3676	=	755	NRXTRT	06,2420	169	3 169	CCT17770	5030	1089	2 1288 1290
NTARGEIT	4751	=	76	NRXTIFA1L	06,2225	163	11 172	CCT20	4747	=	741
NTARGCHK	35,3460	=	678	NRXTIFR1T	06,2213	163	3 163	CCT200C2	06,3136	188	1 188
NTARGFLG	1146	=	76	NRXTRR1AX	25,2263	536	1 536	CCT201	24,2306	501	1 495
NTP/2	34,2376	=	639	NRXTRST	05,3026	218	1 218	CCT20100	10,3543	1363	1 1348
NUCHAN2	01,3012	=	1102	NRXTSUPR	43,3701	1282	1 1282	CCT203	26,2257	477	
NUDIPACT	01,3226	=	1108	NRXT6ADR	56,1465	131	5 220	CCT205	24,3206	516	1 515
NULLCCLK	36,3021	=	738	NZACCCCT	0063	=	1468	CCT21	4261	=	272 2 272
NUM	47,2175	=	400	N45PRCC	35,3563	681	1 680	CCT21103	5700	1373	
NUMPERT	56,1743	=	132	N45PSP	24,2645	505	1 508	CCT217	5794	1373	
NUMGRPS	4756	=	224	N49FLAC	67,1746	=	146	CCT220	04,3255	1323	1 1322
NUVCSM	03,1600	=	112	N85DISP	14,2440	926	2 925	CCT23	4360	=	1091 2 735 1000
NUVLFW	03,1652	=	112	N85LODP	31,2034	611	1 611	CCT23146	21,3320	1468	1 1465
NVBNKTFM	1037	=	102	=====	=====	=====	=====	CCT24	6007	225	6 232 862
NVBIUSMSK	10,3517	=	1362	QANB	04,2520	249	3 248	CCT24100	10,3255	1358	1 1346
NVCADR	10,3510	=	1362	QBLATE	11,2026	1225	2 1221	CCT25	4262	=	1091 2 263 272
NVCOPM	40,2357	=	403	QCCCS	14,2567	929	2 928	CCT26	04,2330	233	2 231
NVCSP	10,3071	=	1355	QCCULT	14,2732	532	2 531	CCT27	05,3773	1237	1 1222
NVDSP1	10,3120	=	1355	CCTAL27	05,3464	826	1 824	CCT272	06,2776	182	1 175
NVMQMDPT	4155	=	454	CCTAL2	6250	1000	1 1091	CCT27470	05,3354	224	1 221
NVCTFM	1036	=	102	CCTRACK	41,2417	445	1 447	CCT30000	4355	=	219
NVSARVE	0371	=	100	CCT00010	4750	=	233	CCT30001	05,3356	224	1 220
NVSAPPAK	4201	=	454	CCT00012	4263	=	501	CCT30002	6474	=	1091
NVSRCFM	4164	=	454	CCT001240	21,3431	1470	1 1465	CCT305	04,2327	233	1 232
NVSRFNDL	40,3475	=	448	CCT02100	06,3137	188		CCT31	6010	225	4 210 1470
NVSRWALT	4445	=	466	CCT05776	06,3033	184	1 183	CCT32001	05,3352	223	1 221
NVSRWTL	4455	=	466	CCT10000	4737	=	219	CCT32002	06,3135	188	1 187
NVSJIR	4154	=	454	CCT10001	7666	=	1091	CCT33	4764	1088	3 225 1088
NVSUPP	41,2100	=	407	CCT10002	33,2250	855	1 871	CCT34	07,2624	260	1 254
NVSUBCCM	4170	=	454	CCT10200	10,3541	1363	1 1349	CCT34BAR	42,3600	438	2 438
NVSURFND	4202	=	454	CCT11	4220	=	1087	CCT3401	10,3513	1362	1 1352
NVSLBSY1	04,2631	=	466	CCT11276	21,3625	1474	1 1472	CCT34300	10,3522	1362	1 1345
NVSURUSY	4442	=	466	CCT120	4775	=	1091	CCT35	4765	1088	3 737 1373
NVSUR1	41,3552	=	455	CCT13	15,2217	524	1 524	CCT37667	04,2370	234	1 225
NVSUR2	41,3577	=	455	CCT14	5741	1274	7 182	CCT37727	06,2162	161	1 171
NVTEMP	1123	=	56	CCT140	4776	=	1091	CCT37766	7732	1090	2 156 1403
NVWDRD	0367	=	100	CCT1400	5007	1088	12 462	CCT37771	37,3535	854	1 853
NVWDRD1	1066	=	102	CCT14000	5024	=	1290	CCT37774	7732	1090	
NV50SP	11,2121	=	1355	CCT15	4761	1087	4 180	CCT37776	7734	1090	3 160 1355
NWATTRIT	4742	=	72	CCT15100	5025	=	182	CCT40001	6112	556	2 1091 1114

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OCT400C10	07,3201	1305	2 1305 1307	OKTCENT	10,3312	1359	1 1361	ONEOCT	26,3710	596	1 593
OCT400C2	14,2371	234	1 229	OKTGRAB	13,3456	1211	1 1211	ONECRTCW	5370	1289	1 1291
OCT400C3	7740	1090		OKTOLPLA	13,2600	1350	3 1349 1350	CNESEK	22,3165	368	4 367 369
OCT400C01	01,3371	1117	1 1114	OKU12	22,2256	355	1 355	ONESTOZS	30,3730	917	3 911 915
OCT400C00	5632	1372	3 1349 1374	OKU21	22,2232	355	1 355	CNETFNTH	21,2453	1409	1 1409
OCT400C20	11,3537	1363		OKU31	22,2302	356	1 356	CNETHTH	34,2107	625	1 638
OCT41000	43,2316	270	2 269 270	OKZDESLA	00,3753	1367	1 1367	CNLITES	25,3620	615	1 615
OCT500	4771	1088	6 265 1436	OLDATAEC	1112	= 103	4 556 561	CNLLAGE	36,2663	735	1 729
OCT500C	14,2326	233	3 231 232	OLDPRATA	21,2263	892	2 892	OP/INERT	43,2175	267	2 265 267
OCT5001PV	24,3275	516	1 516	OLDFESBIT	4753	= 66	2 599 601	CPJUMF	6112	595	1 595
OCT51	43,3225	299	1 298	OLDFESFLG	1016	= 66		CPJUMF2	6252	1001	1 995
OCT523	23,3761	890	1 889	OLDFIFAX	F7,1763	= 152	5 152 811	CPJUMP3	6266	1002	1 1001
OCT54	06,2774	182	1 166	OLDFIPAY	F7,1764	= 152	3 152 811	CPCNLY	06,2347	167	1 165
OCT55000	41,3742	471	1 471	OLDFIFAZ	F7,1765	= 152	4 152 811	CPTAXIS	07,2142	248	
OCT60000	4111	= 1091	2 1292 1299	OLDFEVA	F6,1460	131	4 1402 1421	CPTCADR	1302	= 106	1 223
OCT62	4774	= 1325	1 1325	OLDFPRIO	5402	1289	1 1292	CPTCCARV	43,2227	= 269	1 269
OCT63	17,2351	1436	1 1435	OLDFGRMIA	F6,1461	131	4 1402 1435	OPTIONVN	22,3316	714	1 713
OCT67777	13,3536	1367		OLDFENSE	F6,1745	= 1499	4 1498 1499	CPTICNX	1050	= 102	13 271 714
OCT7	4757	= 1364	3 1288 1293	OLDTIME	32,3717	828	1 828	CPTION1	1143	104	7 306 1352
OCT700	04,2372	234	2 230 232	OLDFXCRP	F6,1440	131	5 131 1413	CPTION2	1144	104	15 495 572
OCT740	6,3101	182	1 176	OLDFXCRP	F6,1441	= 131	2 1413	CPTION3	1145	104	
OCT74160	05,3355	224	1 221	OLDFZFCRC	F6,1442	= 131	3 1402 1414	CPTAREG	F5,1463	= 128	
OCT75	16,2775	182	1 181	OMEGAMS	37,2000	44	1 381	CPTSTALL	07,3704	= 1320	1 935
OCT77000	06,3112	182	1 175	OMEGA	F7,1502	= 146	9 146 1145	CPT4	15,2105	921	1 921
OCT7777	05,3055	219		OMEGAF	F7,1734	= 145	3 317 517	ORBCHEG	24,2007	495	1 495
OCT77770	5650	1373	5 233 1374	OMEGAM1	F5,1712	= 127	3 127 1146	CRECHC1	24,2021	495	1 495
OCT24100	43,2123	264	1 263	OMEGAM2	F5,1720	= 127	3 127 1146	CRECHC2	24,2033	495	1 495
OCT40010	06,2773	182	1 181	OMEGAM3	F5,1726	= 127	3 127 1147	CRECHC3	32,2217	495	1 495
OFFCALC	26,3561	593	1 595	OMEGAP	F6,1421	130	16 130 1428	CRBITAL	11,2000	= 29	2 1218 1231
OFFPCT	27,3307	844	1 844	OMEGAFC	F6,1643	135	12 135 1428	CRBITAL1	12,2000	= 30	1 1237
OFFSTFAC	26,3706	566	1 593	OMEGAQ	F6,1422	= 130	14 724 1437	CRBITAL2	12,2000	= 30	3 46 1237
OFFTHUNT	10,3747	1302	1 1292	OMEGAQC	F6,1644	= 135	7 370 1431	CRBITAL3	05,2000	= 29	1 1237
OGC	F5,1737	= 124	16 124 1244	OMEGAF	F6,1423	= 130	9 1401 1437	ORBMALV	0002	= 236	4 236
OGCPL	37,2475	382	1 385	OMEGARD	F6,1645	= 135	7 370 1431	CRBWFEIT	4746	= 71	
OGCT	F5,1747	= 125	2 125 963	OMEGAU	F6,1426	130	12 130 1442	CRBWFLAG	0066	= 71	3 1212 1234
OGF	F6,1717	= 126		OMEGAV	F6,1427	= 130	2 131 134	OPCFRBIT	4746	= 75	
OHWFLL1	04,3473	1379	5 1379 1381	OMEGCALC	26,3610	594		ORDERSW	0201	= 79	3 1174 1175
OHWFLL2	04,3426	1380	4 1379 1391	OMEGCISF	F7,1734	= 145	3 145 594	CRIG	F4,1515	= 116	
OKDESNP	25,2520	545	1 545	OMEGMCCN	13,2000	46	1 1204	CRIGCHAC	11,3440	1230	1 1230
OKDESSW	25,2423	541	1 544	CNE	4752	= 1091	182 158 1499	CRICEX	F4,1512	= 115	4 115 1230
OKEXIT	24,2347	576	1 576	CNE/SP	25,3561	570	1 570	CRICIN	F5,1773	= 127	
OKMAX	35,3077	669	1 669	ONB-2	23,2513	= 501	1 496	CTHCCN1C	37,3211	704	1 707
OKFHI	22,2722	363	1 363	ONFBASF	37,3403	707	1 703	CTHERS	13,3474	1212	1 1213
OKTHETA	22,2702	363	1 363	CNEBIT	(4,3040	1177	1 1188	CTHINT	37,3222	705	1 707
OKTCCCPY	10,2537	1349	2 1349 1354	ONFOPP	37,3063	394	1 375	CTHPREC	13,3044	= 37	3 701 714

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OTHSHP	22,3333	714		PEIASY	E3,1454	110	1 793	PHSRB1	E3,1437	110	
OURPERMS	E7,1621	= 150	2 15	PEIASZ	E3,1456	110	1 793	PHSRB2	E3,1441	110	
OURPCBIT	4740	= 97	6 1422 1436	PRIT	4742	= 132	4 1422 1425	PHSRB3	E3,1443	110	
OURRCFLG	1376	= 87		PRNDY	F4,1430	114	19 115 1236	PHSRB4	E3,1445	110	
OURTEMP5	E7,1544	= 150	1 150	PCLCCF	G5,2774	217	1 218	PHSRB5	E3,1447	110	
OUT	13,2332	711	1 711	PCONS	F4,1744	= 121	5 121 847	PHSRB6	E3,1451	110	
OUTGAVE	22,3707	= 859		PCA	0026	= 125		PHSCHNGA	5357	1288	1 229
OUTHPE	0161	= 1363	3 1355 1361	PRB1	E6,1561	= 1495	1 1493	PHSCHNG2	10,2224	1290	1 1289
OUTLTNK	1057	= 93		PCB2	E6,1562	= 1495	1 1493	PHSNAME1	E3,1436	110	5 1290 1295
OUTOFLIM	24,2167	515	2 515 516	PCB3	F6,1564	= 1495	1 1493	PHSNAME2	E3,1440	110	1 820
OUTOFLNK	F5,1616	= 123	3 123 781	PDB4	E6,1563	= 1495	1 1493	PHSNAME3	E3,1442	110	1 820
OUTSNLFF	43,3245	299	1 262	PCCL	6526	1012	1 1003	PHSNAME4	E3,1444	110	
OUTT	0710	= 93	5 157 161	PDSPEBIT	4740	= 72	2 476 477	PHSNAME5	E2,1446	110	2 883
OUT2.1	32,2535	575	2 575	PDSPFLAG	0077	= 72	3 477 521	PHSNAME6	E3,1450	110	
OUT2.2	24,3352	577	1 576	PCVL	6562	1013	1 1003	PHSPART2	01,3764	1298	1 1298
OVERFFIX	37,2275	379	2 277 361	PCXCHNGE	12,2274	1169	2 1169	PHSPRDT1	1053	102	5 1285 1297
OVERFLOW	7022	1020	3 1015 1043	PEGT	16,3304	1425	2 1425	PHSPRDT2	1055	102	3 230 823
OVERFLWY	7017	1020	4 1018 1043	PERFCEK	10,3136	1356		PHSPRDT3	1057	102	1 224
OVERFLWZ	7014	1020	4 1018 1043	PERFDLAY	E5,1574	= 125	1 375	PHSPRDT4	1061	102	1 223
OVERSLP	16,2310	1412	12 1414 1431	PERFEFAS	37,2772	388	1 386	PHSPRDT5	1063	102	
OVERSLB2	20,2451	1405	3 1415 1406	PERFMASK	10,3476	1362	2 1350 1352	PHSPRDT6	1065	102	
OVE+	00,2414	1049	2 1045	PERF2MSK	10,3502	1362	2 1350 1352	PHS2CACR	01,3771	1298	1 1293
OVFIND	0121	96	13 807 1101	PERF4MSK	10,3504	1362	1 1352	PI/16	27,3754	1273	2 1265 1271
OVFLCLR	12,3210	1184	1 1184	PERIAPC	23,2351	655	1 637	PICAPAR	14,2633	930	1 920
OVFLOWCK	E5,1576	= 129	3 374 389	PERIAPC1	23,2341	655	3 620 663	PICBXT	14,3005	933	1 933
=====	=====	=====	=====	PERIQCH	12,2112	1167	1 1167	PICEND	14,2760	932	1 931
P	E5,1727	= 126	14 126 1192	PERROF	E6,1464	131	8 155 1428	PICGXT	14,2764	933	1 933
P-RATE	16,2510	1415		PFAILCK	07,3246	1307	1 167	PICKANGI	27,2147	484	1 484
P-PHCTR	0043	= 92	4 1424	PFAILCK2	07,3241	1307	1 1307	PICKAXIS	27,2170	485	2 483
PACCFUN	E6,1557	= 1495	2 1488	PLITECB	20,2143	1358	3 747 833	PICKX	26,2376	485	2 485
PACKOPTN	15,3374	968	2 967	PRATEIT	4750	= 69	1 920	PICNSWP	14,3003	933	1 933
PACTIVE	15,3324	218	1 218	PRATFLG	0051	= 69	4 762 937	PIC1	14,2640	931	3 931
PARAM	04,3046	1178	3 1178 1192	PGUIDE	1246	= 105	6 105 875	PIC2	14,2643	931	1 931
PARAMBC	35,2021	617		PHASCHNG	5353	1288	120 229 1385	PIC3	14,2653	931	5 931 932
PASSIVE	23,2435	697	4 625 657	PHASETAB	10,2700	= 29	2 1284 1290	PIC4	14,2656	931	1 931
PASTFCFT	4132	441	1 441	PHASE1	0752	100	3 218 1252	PIF	E7,1612	= 150	11 150 807
PASTFVP	4124	441	3 441 448	PHASE2	0754	101	2 754 853	PIFFSET	E7,1606	= 150	5 150 785
PASTIT	07,2211	252	1 261	PHASE3	0756	101	1 725	PIACT	05,3041	218	1 218
PALTN	30,3151	905	2 904	PHASE4	0760	101	1 857	PIBALL1	40,2000	= 36	2 300 355
PAXADICL	16,2204	1403	1 1402	PHASE5	0762	101	1 729	PIBALL2	41,2000	= 36	1 407
PAXDIST	E6,1565	= 1495	2 1493	PHASE6	0764	101	1 724	PIBALL3	42,2000	= 36	3 282 422
PAXFILT	16,2647	1418	1 1412	PHASJUMP	5363	1289	1 1288	PIBALL4	44,2000	= 28	1 455
PAXIS	16,2213	1411	2 1413 1456	PHAXIT	13,3177	1207	1 1207	PIANREIT	4746	= 73	
PAXISAFR	20,3772	1496	1 1481	PHI	0024	= 522		PIANRFLC	0105	= 73	1 1355
PRIASX	E3,1452	110	2 110 793	PHIV	E4,1445	= 115	6 115 1232	PIANRACH	10,3051	1354	7 228 1362

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
PINIMASK	10,3350	1359	1 1359	PLANTIN2	26,2000	= 33	1 52	PCSGMEL	37,2064	375	
PINMASK	7743	= 1362	1 1355	PLANTIN3	25,2000	= 32	1 1136	PCSGN	40,2407	403	1 399
PINSUPRT	4201	= 454	5 275 458	PLANVEC	E7,1553	= 146	5 146 944	PCSGOCD	33,3643	888	2 888 889
PINSUPR	40,2000	= 36	1 275	PLAST	E6,1454	121	5 1414 1425	PCSITA	15,3663	977	1 578
PIATEST	42,2002	= 468		PLAYJUM	10,2616	1250	3 1255 1262	PCSITH	15,3666	977	1 578
PIARIAS	F3,1452	= 110	1 327	PLAYTEM1	0155	= 1363	28 1344 1353	PCSITC	15,3705	978	1 575
PIPACHK	37,2126	376	1 375	PLAYTEM2	0157	= 1363	3 1352 1360	PCSITE	15,3753	979	1 578
PIPAGE	1256	= 115	5 117 866	PLAYTEM4	0160	= 1363	11 1344 1360	PCSITF	15,3726	978	
PIPASC	37,3077	390	1 386	PLNTY	25,3223	557	1 557	PCSITCA	F5,1416	= 128	6 128 382
PIPASC	F3,1453	= 110	1 327	PLUSFIRE	21,3714	1495	1 1495	PCSMAX	4733	1087	45 172 1496
PIPASC	F3,1453	110	1 110	PLUSX	27,2423	762		PCSNV	F5,1520	= 125	2 387 388
PIPASC	F3,1455	110		PMINE	34,2072	635	2 644	PCSTAND	37,3731	1326	2 1325 1326
PIPASC	F3,1457	110		PMINM	34,2103	635		PCSTBURN	36,3227	747	4 241 753
PIPASP	37,3536	864	4 325 555	PMASK	10,3515	1362	1 1350	PCSTCE	E7,1603	142	3 142 644
PIPATASK	37,2151	376	2 376	PMINTER	0156	= 1258	7 1256 1258	PCSTCCM	37,3760	1327	2 1327
PIPATMFX	1157	104	4 811 854	PMINTVSM	E7,1772	= 147	7 153 945	PCSTCS1	F1,1601	142	2 637 644
PIPATMFX	1160	104	4 811 854	PCLISH	0117	96	35 96 1086	PCSTHRST	21,3650	1458	5 1455 1500
PIPATMFX	1161	104	4 811 855	POLLEY	5051	1054	2 1054	POSTJUMP	4635	990	62 166 1392
PIPAV	0037	= 92	15 216 1308	PCLY	7225	1026	7 851 1272	POSTORRP	E6,1513	= 133	1 196
PIPAY	0040	= 92	6 384 1308	POLYCNT	0140	= 97	4 1026 1027	POSTCRKV	E6,1515	= 133	5 195 205
PIPAZ	0041	= 92	9 384 1308	PCLYCEFF	12,3031	1181	1 1183	POSTORKV	E6,1517	= 134	
PIPCTP	1055	= 823	4 601 853	POLYCCM	7235	1026	1 1026	PCSTST	33,3676	885	3 870 885
PIPCTR1	F7,1714	= 823	2 823 851	PCLYLOOP	7245	1027	1 1027	PCSTTPI	F7,1605	142	4 142 663
PIPFALL	06,2650	178	1 182	PCLYRET	0141	= 97	3 1026 1027	PCSUPCAT	33,3127	877	
PIPERFE	07,3302	1308	1 1308	PCLYTEMP	F6,1741	= 132	10 1420 1448	PCSVMAX	21,2674	858	2 898
PIPERFE2	07,3277	1308	1 1308	PCLY2	7250	1027	1 1027	PCSL/2	4736	= 1051	2 1114
PIPINDEX	F5,1415	= 128	6 128 380	PCN	37,2251	377	1 377	PCSL/4	12,3765	= 1237	
PIPJCEP	37,2166	376	1 376	PCN2	37,2240	377		PCSLCHK	33,2536	870	1 869
PIPSONE	37,3447	853	1 866	PCN4	37,2245	377	1 377	PCSLCHK	33,2540	870	1 869
PIPSRINE	37,3541	= 955	2 955	PCDOCC	5642	1373	5 244 1224	PCSLPCE	20,2153	1358	2 1357 1358
PIPTFM	E4,1657	= 117	7 128 867	PDOOQO1	5716	1374	2 1071 1124	PCWFLITE	23,2000	= 32	1 1249
PIPTIME	1233	105	26 156 1213	PCDFIZZ	04,2261	232	1 231	PCWFLI11	23,2000	= 32	
PIPTIME1	E7,1560	= 148	11 148 1215	PCDH	04,2165	230		PCWRSEPS	7220	1026	2 818
PIPLSF	07,3265	1308		PCDFBIT	4735	= 70		PCWR11	16,3132	1423	1 1423
PIPUSE1	07,3271	1308	1 337	PCDFFLAG	0055	= 70	3 230 1210	PCWTE	E4,1750	= 121	9 121 847
PITCH	E4,1764	= 121	2 317 823	PCDFKLAN	15,2645	215	1 231	PCWTTAP	01,2000	= 239	3 1296 1298
PITCHANG	F4,1600	= 119	7 119 490	PCSALARM	23,3655	888	2 888 885	PCWJUMP	5316	1284	
PITCHOFF	27,3269	775	2 774	PCSALPH	21,3362	1469	2 1465	PCXCITE	4744	= 71	
PITFALL	11,2302	814	2 155	PCSCHECK	21,3674	1465	1 1458	PCXCIFLG	0064	= 71	6 237 1210
PITTIME	F6,1402	130	2 315 774	PCSCODE	1241	= 953	6 317 552	PCXCSET	23,2403	657	4 625 666
PJFCTCR	E6,1767	138	4 138 1418	PCSDFL	12,2620	1175	1 1174	PCXCCT	7157	1025	2 1030 1033
PJFSLFC	16,3362	1426	5 1421 1425	PCSDGLX	12,2246	1165	1 1168	PCXSPAL	40,3452	448	1 418
PLANT	15,2472	954	7 935 962	PCSDRIVE	21,3566	1473	2 1463 1473	PCXGUIDE	31,2353	751	1 757
PLANTIN	24,2000	= 32	1 1133	PCSEFC	42,3414	425	2 425	PCXNM1	04,2435	235	2 229 233
PLANTIN1	26,2000	= 33	2 1132 1138	PCSFNCT1	21,3221	1464	1 1464	PCXNM1	11,2323	814	1 815

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PREFMON2	11,2324	814	1 815	PRIC34	7725	1089	1 1091	PURRS4	10,2716	1352	2 1351 1352
PRENVESY	4437	466	1 466	PRIC35	7726	1090	1 1113	PUSP	10,3247	1069	1 1005
PREFCS29	25,3564	600	1 599	PRIC36	7727	1090	1 564	PUSHLCC	0166	59	38 252 1101
PREFEAC	37,2410	852	1 725	PRIC37	7730	1090	8 233 1394	PUSHUP	6220	1000	1 596
PREFRCRS	43,3267	1276	3 1277	PRIC4	4740	= 1091	4 275 491	PUTACC	41,2334	412	3 412
PRESINE	00,3526	1074	2 1074	PRIC5	5017	1089	10 230 1200	PUTCOM	41,3101	431	8 427 429
PRESTANE	27,2654	1325	1 1325	PRIC6	5020	1089	4 538 1419	PUTCCM2	41,3161	432	4 431 434
PRESTORE	6424	1008	1 1008	PRIC7	5021	1089	7 276 717	PUTCCSF2	41,3213	432	1 432
PRESTIMCK	16,2667	1418	2 1417	PRILIMIT	33,2200	850	2 841	PUTCCSF	41,3200	432	2 431 432
PRINPORT	10,2576	1350	2 1348 1358	PRICFED	18,2412	1360	1 1358	PUTFCOM	41,3134	431	1 432
PRICCHAG	5146	1097	19 276 1359	PRICFDE	06,2075	159		PLTNCRM	41,3143	431	1 431
PRICCH2	01,3073	1104	1 1097	PRICKEY	40,3506	451	1 159	PUTSFNCP	41,3212	432	1 432
PRICFEIT	4736	= 72	1 1255	PRICKEY1	40,3514	451		PUTXY	41,2720	428	
PRICFLG	0075	= 72		PRICCTACN	06,2242	165	1 165	PUTXYZ	41,2636	427	
PRICOSP	10,2511	1348	2 507 509	PRICLCT	21,3516	1472		PVALVEST	1273	106	7 192 212
PRICOSPR	10,2505	1348	2 517 1372	PRICLARM	5614	1371	2 1371	PWRCN1	0140	= 98	2 818
PRICENT	5575	1371	2 1372 1374	PRICGRAV	15,2652	958	1 958	PWRPTR	0117	= 58	4 817 818
PRICFLARM	10,3563	1372	7 498 888	PRICG20	24,2000	494	2 235 494	PONCHK	13,3352	1210	2 1205 1210
PRICCT	10,3532	1363	2 1346 1353	PRICG21A	24,2340	457	3 495 497	PC5PC6	37,2000	= 36	1 1325
PRICPLAY	10,2617	1350	2 1346 1349	PRICG21	24,3505	655	1 235	P06	37,3652	1325	1 235
PRICFTY	0167	99	34 222 1351	PRICG22	24,2000	= 454	1 235	P1CHK	33,3664	888	1 888
PRICTIME	1164	104	2 1349 1359	PRICG25	24,2400	504	1 235	P12	30,2000	= 34	1 831
PRIC1	4742	= 1091		PRICG52	15,2050	920	1 234	P12A	23,2000	= 32	
PRIC10	4737	= 1091	5 265 774	PRICJ	0022	= 151		P12ADRES	30,2314	834	1 832
PRIC11	5022	1089		PRICJMAX	31,3734	821	1 806	P12IGN	36,2525	722	1 723
PRIC12	4644	999	3 212 753	PRICJMIN	31,3735	821	1 806	P12INAT	30,2251	833	2 826 831
PRIC13	5023	1089	3 738 1345	PRICJ	30,2553	841	2 841	P12LM	30,2061	831	1 235
PRIC14	5024	1089	3 505 1293	PRICNVRIT	4745	= 73		P12LMB	30,2122	831	
PRIC15	5025	1089	5 162 1361	PRICNVLG	0104	= 72	1 1356	P12RET	30,2216	833	1 843
PRIC16	5026	1089	6 182 733	PRICNRTMP	4415	464	4 421 423	P12SPQT	36,2150	= 725	1 723
PRIC17	5027	1089	5 727 846	PRIC2ADR	01,3772	1298	1 1295	P12TAELE	36,2024	723	1 834
PRIC2	4741	= 1091		PSEUDO55	07,1614	= 150	3 150 788	P2CHK	33,3672	888	1 888
PRIC20	4736	= 1091	8 269 853	PSIV	04,1453	= 115	3 115 1232	P2CFLGCM	35,2366	632	4 624 666
PRIC21	5031	1089	4 325 852	PSK1PADR	16,2627	1421		P2OLEMA	24,2111	498	2 498 511
PRIC22	7713	1089	6 291 871	PSTHIRT	4741	= 84	2 869 877	P2CLFMB	24,2117	458	6 498 499
PRIC23	7714	1089	2 255 888	PSTHIGAT	0251	= 83		P2OLEMB1	24,2163	459	1 515
PRIC24	7715	1089	1 554	PTBAD	05,3052	218	3 217	P2OLEMB2	24,2166	459	1 499
PRIC25	7716	1089	4 492 857	PTIGINC	07,1402	139	1 666	P2OLEMB3	24,2170	459	2 499 500
PRIC26	7717	1089	10 369 808	PTACSM	13,2706	1202	1 1207	P2OLEMB4	24,2205	500	1 499
PRIC27	7720	1089	5 193 1401	PTDALEM	13,2761	1203	2 298 1207	P2OLEMB5	24,2135	499	1 507
PRIC3	5015	1089	13 252 1051	PLLSFLG	0303	= 87	4 285 784	P2OLEMB6	24,2153	459	2 499
PRIC30	4355	= 1091	12 175 1361	PLLSFIML	10,3706	1350	1 381	P2OLEMB7	24,2130	458	
PRIC31	7721	1089	5 337 1431	PULSEM	14,3222	938		P2OLEMC	24,2217	500	3 507 509
PRIC32	7723	1089	4 667 1357	PLLSFS	4735	= 87	3 730 1434	P2OLEMC1	24,2244	500	3 240 501
PRIC33	7724	1089	1 1349	PLRGNCY	16,2467	1428	4 1420 1425	P2OLEMC2	24,2261	501	1 500

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P21LFC3	24,2211	500	3 499 511	P32/P72R	35,2136	625	1 626	P41JET1	36,3311	748	1 748
P21LFC4	24,2216	500	1 502	P32/P72C	35,2157	626	1 644	P41IN	36,3314	749	1 748
P21LFC	24,2264	501	1 500	P32/P72D	35,2163	626	1 626	P41LM	36,3276	748	1 234
P21LFMD1	24,2277	501	2 501	P32/P72F	35,2165	626	1 626	P41MANL	36,3221	747	
P21LFMD2	24,2277	501	1 501	P32/P72F	35,2173	626	1 626	P41NCFM	36,3316	749	
P21LFMF	24,2231	500		P32STRT	35,2137	624	1 624	P41SPCT	36,2153	726	2 724 725
P21LFMWt	24,2232	500	4 498 522	P33	35,2223	630	1 235	P41TABLE	36,2055	724	2 741 756
P21LFM1	24,2263	498	2 498 518	P33/P73A	35,2226	630	2 630 631	P42ACRES	36,3141	741	1 750
P21LFMT1	24,2241	500		P33/P73R	35,2240	630	1 631	P42IGN	36,2545	732	4 724 732
P21PFG	24,2321	233	1 232	P33/P73C	35,2307	631	1 630	P42LM	36,3414	750	1 234
P21PS	24,2000	=	2 8 494 655	P33/P73D	35,2313	631	1 631	P42SPCT	36,2150	=	725 1 724
P21PS1	25,2000	=	32 3 528 570	P33/P73E	35,2321	631	1 631	P42STAGE	36,3424	750	1 724
P21PS2	25,2000	=	32	P33/P73F	35,2332	631	1 631	P42TABLE	36,2063	724	1 741
P21PS3	26,2000	=	33 1 579	P34	35,2455	661	1 235	P47RCE	36,3510	752	1 752
P21PS4	32,2030	=	34 1 495	P34/P74A	35,2460	661	2 661 662	P47BODY	36,3517	752	2 751 752
P21	F6,17 3	=	126	P34/P74B	35,2502	661	1 661	P47LM	36,3442	751	1 234
P21ALT	F7,1715	=	149 2 318 657	P34/P74C	35,2504	661	1 663	P50CS	15,2000	=	31 5 250 957
P21RASF	F7,1675	=	149 3 149 656	P34/P74D	35,2545	662	1 662	P50S1	14,2000	=	31 2 45 926
P21PASV	F7,1702	=	149 3 149 656	P34/P74E	35,2550	662	1 662	P51	14,3421	943	3 234 944
P21PCAT	24,3554	656	1 655	P35	35,2635	666	1 234	P51B	14,3453	943	1 943
P21OSP	24,2631	656	1 656	P35/P75A	35,2644	666	1 666	P51C	14,3464	943	1 944
P21FLAC	1004	=	65 2 655 656	P35/P75B	35,2651	666	1 666	P51C	14,3502	944	1 942
P21FLRIT	4741	=	65 1 218	P40/RET	1141	104	4 738 747	P51E	14,3522	944	1 944
P21GAM	F7,1713	=	149 2 149 656	P40A/P	35,3711	740	1 741	P51C	14,3544	944	1 944
P21CPIC	1162	=	149 2 656	P40A/PMD	35,3725	741	1 741	P52A	15,2060	921	2 921
P21PRGG1	24,3520	655	1 657	P40ADRES	36,3137	741	1 746	P52B	15,2062	921	1 921
P21FPC2	24,3532	655	1 657	P40ALM	36,3125	740	2 746 750	P52D	15,2143	923	2 923 925
P21PPTM	24,3666	657	1 655	P40AUTC	35,3767	740	2 725 828	P52E	15,2102	921	
P21TIME	F7,1762	=	147 7 144 657	P40IGN	36,2510	731	1 724	P52F	15,2164	923	1 921
P21VEL	F7,1711	=	149 4 149 656	P40IN	36,3204	747	1 751	P52H	15,2153	923	1 921
P21VSAF	24,3575	656	1 656	P40LM	36,3153	746	1 234	P52LS	15,2220	925	1 922
P25FLAG	1006	=	66 3 288 778	P40PHS1	36,3242	748	2 748 752	P52CUT	15,2166	923	1 924
P25FLBIT	4743	=	66 2 229 504	P40S	36,2000	=	36 6 38 746	P52T	15,2110	921	2 921
P25LFM1	24,2414	504	3 240 505	P40SJLAK	36,2372	729	2 724	P52V	15,2130	921	
P25LFM2	24,2437	505	1 505	P40SPCT	36,2150	725	3 723 725	P52W	15,2137	923	1 921
P25LFMT1	24,2433	505	1 505	P40SXT4	36,2217	747	2 747 749	P57	15,3277	967	1 234
P3XORP7X	35,3613	683	1 680	P40S1	27,2000	=	33 4 38 757	P57A	15,3336	967	
P30	35,2000	617	1 235	P40S2	35,2000	=	35 1 740	P57AA	15,3340	967	1 967
P30EXIT	F5,1773	=	127 1 127	P40S3	35,2000	=	35 1 723	P57C	15,3363	968	2 968
P30N33	35,2004	617		P40TABLE	36,2040	723	1 741	P57C	15,3365	968	1 968
P30S	35,2000	=	35 1 617	P40ZOOM	35,3677	733	1 733	P57JUMP	15,3544	972	2 964
P30S1	34,2000	=	34 1 619	P40ZCCMA	35,3704	734	1 733	P57CPT	15,3303	967	2 967
P30ZFC	35,2424	634	10 624 661	P41ADRES	36,3140	741	1 748	P57CPT0	15,3560	973	2 972
P32	35,2034	624	1 235	P41BLANK	36,2265	727	1 727	P57CPT1	15,3601	973	1 972
P32/P72A	35,2060	624	1 624	P41FJKT	36,3307	748		P57CPT2	15,3617	974	1 972

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P570PT3	15,3620	974	1 572	Q+1	6742	1017	7 158 1364	=====	=====	=====	=====
P570QST	15,3171	964	3 963 964	Q+1000	4643	990	1 992	R	E7,1520	=	148 24 148 875
P63ADPES	32,3254	782	1 773	Q+2	6744	=	1017 5 523 1369	R(CSM)	E3,1717	=	121 7 601 875
P63DISPS	31,3450	808	1 792	Q-RATE	16,2544	1416	2 1416	P*TL**F	23,3702	1253	2 1254
P63IGA	36,2464	731	1 725	Q-RHCTR	0042	=	92 3 1423 1424	R-CTHER	E3,1717	112	5 121 322
P63IGN1	36,2520	721		Q,RCRGIS	17,2136	1432	1 1432	R-PATE	16,2602	1417	2 1416
P63LM	32,2777	778	1 234	QACCDCT	56,1510	=	122 6 1401 1481	R-RHCTR	0044	=	92 3 1423 1424
P63SPT	36,2153	=	725 1 724	QXIS	E7,1717	=	152 3 833 849	R-TC-RP	24,3677	1134	6 784 1225
P63SPT2	32,3216	781	1 781	QODULSR	E6,1647	=	137 3 137 911	PACCGCT	E6,1512	=	133 4 1401 1466
P63SPT3	32,3236	782	1 742	QCHAN	0002	=	53 2 1085	RACTCADR	05,3060	219	1 218
P63SPT4	32,3250	782	1 792	QDIFF	E6,1450	=	133 3 1462 1467	RACT1	E4,1702	117	11 116 645
P63TAE1F	36,2130	724	2 741 782	QERRCALC	17,2655	1441	2 1403 1432	RACT2	E4,1710	117	9 118 650
P63TCM	35,3672	733		QFPCALL	16,3642	1431	1 1431	RACT3	E7,1535	142	20 625 697
P640ED	31,3470	808	1 808	QFRRR	E6,1450	=	131 5 133 1442	RADARANG	26,3361	550	2 584 585
P640P	31,3727	821	1 756	QGTMBITS	5007	=	1419 1 1418	PACAREAC	25,3157	557	2 155
P64DISPS	31,3453	808	2 752 808	GGTMTMR	E6,1632	135	9 135 1470	PACARFF	4000	=	28 1 522
P65START	31,2557	795	1 751	QLAST	E6,1455	131	5 1414 1437	RACARLPT	25,2000	=	32 3 41 615
P65VFT	31,3517	819		QMAJ	E5,1746	=	125 17 125 575	RACADP	1303	=	106 4 223 543
P65VERTA	32,3271	810	1 809	QMIN	E5,1745	=	125 17 125 963	RACDEL	1270	106	2 563
P66LOC	32,2000	=	34 1 810	QMINXIT	15,2755	959	1 961	RACIN	25,3332	559	1 559
P66QW?	31,2522	794		QOK	26,2611	581	1 581	RADLITES	25,3572	615	2 558 562
P66VFT	31,3522	810	1 809	QPLACE	E5,1417	=	128 7 128 382	RACNCCES	0110	=	85 116 174 871
P66VFTA	32,3277	810	1 810	QPLACES	E5,1420	=	128 3 128 381	RACNCCF	25,3513	565	2 539 565
P67QW?	31,2426	793		QPPET	0052	=	93 19 299 1233	PACSAMP	25,2003	492	2 278 492
P67VERT	31,3524	810	1 809	QRATEDIF	E6,1436	=	131 2 1437	PACSKAL	1351	108	1 877
P70	21,2167	824	1 234	QPAKIS	E6,2630	1421	4 1419 1428	RADSTALL	07,3706	1319	17 265 888
P70A	21,2370	824	2 242 824	QPBIT	4741	=	132 4 1423 1438	RACSTAPT	17,2000	563	3 556 562
P70CADR	14,2402	234	1 234	QRCNTR	E6,1750	=	133 9 1462 1474	RACTIME	1267	105	2 563
P70CINT	32,3571	826		QRCNTRL	17,2232	1434	1 1433	PAVIN	E5,1562	=	123 3 123 848
P70QW?	21,2056	824		QRNCEP	0066	=	1468 9 1469 1470	RANGCCNV	32,2003	41	1 574
P7071FIT	4737	=	80	QRTIME	17,2544	1438	2 1438	RANGE	E4,1600	116	10 116 705
P7071FLG	0211	=	80 4 826 843	QRLPT	0112	=	92 13 156 1418	RANGFRQ	26,2514	580	3 580 587
P71	21,2072	824		QSAVED	E7,1464	141	2 680 681	RANGEEQ1	26,2524	580	1 580
P71A	21,2073	824	2 242 824	QTFMF	E7,1632	143	5 619 755	RANGCSP	E5,1616	=	123 3 123 800
P71QW?	21,2042	823		QTFMP1	E7,1665	143	6 143 755	RANGFVAR	E3,1770	113	1 581
P71RFT	32,3712	828	1 826	QTSN45	23,2525	1247	1 1241	PANGRCCT	E7,1760	=	147 3 147 574
P72	35,2036	624	1 234	QUACCUIC	31,3101	802		RAPEG	E5,1436	=	122 1 122
P73	35,2225	630	1 234	QUARTER	4737	=	1091 4 1073 1078	PAPC	0020	=	1264 1 1264
P74	35,2457	661	1 234	QUICTRIG	23,3617	1251	5 604 1251	RAPPEC	E7,1477	=	142 2 667 670
P75	35,2641	666	1 234	QUICKSF	06,2134	161	1 156	PASFLAC	0106	=	82 6 1210 1211
P76	13,2207	709	1 234	QUICKFAZ5	33,3514	883	11 856 882	PASTEER1	27,2731	769	1 764
P76LOC	13,2000	=	30 1 709	QUICKFF	06,2165	161	1 161	RATEBIAS	22,3133	368	1 368
P76SUR1	13,2340	711	1 710	QUICKRPT	06,2144	161	1 161	RATEDAMP	16,3223	1424	4 1422 1423
=====	=====	=====	=====	QUITBIT	4747	=	81	RATEDC1	4767	=	1500 1 1499
Q	0102	=	92 436 93 1499	QUITFLAG	0221	=	81 4 299 1209	RATEDISP	42,2167	266	1 262

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
RATEDFNE	16,3134	1423	1 1423	RECTONCM	34,3370	835	1 832	RECSRTEN	32,2017	208	2 208
RATFINCX	1322	117	2 213 365	RDDTM	E7,1750	147	3 147	REFFLASH	11,2460	1347	3 737 808
RATFLIM1	4766	= 1500	1 1499	RDDTMSAV	E7,1746	147	4 146	REFLASHR	10,2463	1347	1 748
RATFLIM2	21,3647	1498	2 1501	RDDTV	E7,1616	142	4 143	REFEMF	15,3471	971	3 785 972
RATFLCCP	16,3645	1460	2 1418 1460	RDRST	E7,1675	146	3 146	REFSMRIT	4737	= 70	7 207 1322
RATERPOR	16,3222	1424	1 1424	RDPCCS	25,2065	493	1 493	REFSMFLG	0057	= 70	7 680 964
RATES	30,2510	840	1 840	RDRPTBB	4063	155	1 154	REFSMMAT	E3,1733	112	53 195 971
RATESR	05,2927	52	2 578	RDRSFCK	43,2674	281	5 265	REGCOARS	15,2156	923	1 924
RATESTCP	31,2422	897	2 897 820	RDSF	E5,1434	128		REGODSP	10,2466	1348	3 728 808
RATESTRT	05,3157	219	1 213	READACCS	37,3437	853	1 866	REGCCSFR	17,2471	1348	
RATEVAR	E3,1772	113	1 582	READCCUD	22,2322	522	1 520	REGSLEEF	07,3364	1310	1 1310
RATT	05,0000	= 1238	32 340 1215	READCCLK	22,2403	358	2 352	REGUR	6236	1000	3 1000
RATT1	01,0116	= 1238	11 210 780	READDLO	40,3003	422	4 421	REINTEIT	4745	= 82	3 1211 1374
RBPFR	05,1472	= 122	2 122 820	REAFCL1	40,3014	422	1 422	REINTEFLG	0236	= 82	5 711 1382
RCE-13	05,2025	52	1 578	READORBIT	4743	= 71	3 220	REJALM	07,2467	257	1 257
RCDUFAT1	0274	= 86		READRCOT	22,2404	573	1 575	REJECT	07,2472	257	1 257
RCDUFBIT	4745	= 86	6 185 567	READRFLG	0063	= 71	1 610	REJECT2	07,2505	257	1 257
RCDUFBIT	4737	= 85	5 499 539	READV	23,3471	882	1 882	RELCSE	4457	466	10 228 829
RCDUFELG	0266	= 85		READVEIT	4747	= 84	1 882	RELDSPCN	4274	463	3 399 466
RCNDEM	0042	= 126	3 1170 1171	READVEL	0257	= 84	1 882	RELCSF1	4502	467	2 440 452
RCC	E7,1630	= 153	5 153 849	RECALTST	40,3612	460	2 425	RELCSF2	4473	467	2 467
RCS	17,2141	1432	4 1439 1440	RECALL1	40,3615	460	1 460	RELINTC	10,3223	1357	2 1352 1357
RCSFLACS	1262	105	55 212 1473	RECALL2	40,3626	460	2 460	RELINLS	26,2232	477	1 240
RCSMCN	16,3164	192	1 192	RECALL3	40,3640	460		RELICACS	11,3651	1234	1 1233
RCSMONEX	5270	= 191	2 192 193	RECPRATIC	13,3740	1238	1 1229	RELRT	0144	= 57	4 466 467
RCSMCNIT	06,3164	= 192	2 193	RECTEST	11,3342	1225	3 1228	RELTAB	4066	156	4 158 445
RCSMINT	16,2102	= 29	1 191	RECTIFY	13,3673	1231	8 1148	RELTAB11	4101	156	2 157 1091
RCV	E3,1534	= 111	28 111 1231	RECTOLT	13,3201	1207	2 1207	REMARK	07,2577	260	3 257 259
RCVCSM	E3,1616	112	1 589	REC-OVER	31,3476	808	1 808	REMDIST	42,2000	46	1 489
RCVLEM	E3,1660	112	2 502 589	RECES-CK	31,3500	808	1 808	REMODBIT	4736	= 85	6 534 559
RCDADEND	25,3545	567	4 548 567	RECFSIG	21,2664	757	1 751	REMODE	25,2232	533	2 548 600
RDCDLS	14,3495	941	1 941	RECESMCN	11,2326	814	1 814	REMODFLG	0265	= 85	
RDE	13,3746	1238	1 1225	REFRES1	31,2735	798	1 798	RENDEND	26,3176	586	1 582
RDEFS	1313	= 116	4 116 536	REFDFLAG	0142	= 76	5 778	RENCFZ	22,2009	= 32	1 1149
RDESGAIN	25,3075	554	2 552	REFFLBIT	4746	= 76	2 797	RENDFZVL	0002	= 236	13 236
RDESTRED	E5,1755	= 126	3 126 1150	REFDC	37,2002	374	1 291	RENCNC	04,2264	232	2 231
RDC	05,1402	= 820	2 801 802	REFDOCTR	0320	99	3 195	RENERAC	25,3277	559	1 558
RDGMS	34,3622	887	1 885	RECFCMANC	26,2154	476	1 476	RENVCO	04,2231	231	1 231
RDIFF	E6,1452	= 132		RECFCMANN	26,2131	475		RENCEWIT	4753	= 75	1 291
RDLNCF	40,3723	422	1 422	RECFCMASK	10,2505	1362	2 1347	RENCEWFLG	0131	= 75	13 237 1234
RDM	13,3744	1238		RECFCPRIC	10,2543	1349	1 1362	RENEWMK	07,2502	257	1 257
RDCT	E7,1473	= 120	5 833 848	REDQ2.17	36,2341	728	1 240	REFETE	35,3107	669	1 669
RDDTRIAS	25,2101	41	1 559	REFQ4.2	36,2344	729	2 241	REFRIP1	37,3554	865	1 866
RDDTCCNV	32,2001	41	1 574	REFQ5.5	27,3451	853	1 242	REFRIP3	37,3562	865	1 866
RDDTD	E4,1672	= 120	5 120 839	REDQ6.7	26,3354	749	1 242	REFRIP4	37,3566	865	4 866

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REFCSBIT	4741	=	85	8	188	600	REFV1645	35,2026	618	1	618
REPOSCNT	F7,1423	=	140	4	140	512	REFV83	37,3155	704	1	706
REFCSVCN	(127)	=	85				REFALLCNT	E4,1575	=	120	3
PEROSRRT	25,2155	=	532	1	536		REFALLS	40,3734	473	1	472
PEROSTM	E7,1424	=	140	5	149	513	REFALLS2	41,3741	471	1	470
REP4NALM	36,3127	740	2	724	740		REFEXIT	E7,1665	=	143	
REQADP	41,2064	408	1	408			RGIMBITS	5020	=	1419	1
REQCCV	41,2312	412	2	412			RGIMTMR	E6,1634	=	135	5
REQDATX	41,2305	412	3	427	428		RGCCDEND	25,3540	567	6	
REQDATY	41,2317	412	3	427	428		RGU	E5,1626	=	123	8
REQDATZ	41,2311	412	3	428	428		RGVGCALC	31,2773	800	5	
REQEXLCC	41,2207	410					RRACTIV	17,2377	1436	1	
REQEX1	41,3501	450	1	450			RHOMVED	16,3226	1424	1	
REQVM	41,3460	449	1	449			RHOSCALE	4745	=	88	1
REQRPT	1012	101	17	223	458		RHOSCFLG	1312	=	87	
REQUESTC	41,3505	450	1	450			RIGHT	00,2236	1046	1	
RERRADAC	37,3611	866	3	242			RIGHT-	00,2232	1048	1	
RERRFCS	33,3632	888	1	239			RIGHTR	00,2031	1039	1	
RERRCALC	17,2675	1441					RIGITS	4322	462	2	
RERRRDP	E6,1452	=	121	5	133	1442	RIGEX	E5,1474	=	122	2
RERRAD	26,2243	477	1	477			RIGNZ	E5,1476	=	122	2
RESAMPLE	25,3264	558	1	561			RINIT	F4,1722	119	10	
RESSTRPT	11,2342	815	2	815			RLAST	F6,1456	131	5	
RESFTX2	12,3120	1183	1	1181			RLM	F4,1604	=	119	16
RESFT22	04,2252	232	2	231			RLMSRCH	E7,1675	=	145	6
RESFT57	43,2351	272	1	272			RLYUNIT	0014	=	596	
RESIGN	35,3133	670	1	670			RLS	F4,1422	114	15	
RESO	33,2037	44	1	873			RLV	E7,1756	=	147	6
REST	10,3246	1358	1	1355			RMAG	E7,1714	=	144	5
RESTART	01,2000	=	28	4	239	1297	RMAG1	0014	=	1258	4
RESTART2	31,2532	794	2	794			RMAX	F4,1474	114	1	
RESTARTS	01,3527	1293	1	219			RMC	12,2021	=	37	1
RESTOPCB	20,2115	1397	8	289	1399		RMM	12,2017	=	37	
RESTRFC	0366	100	4	212	1354		RMCINIT	05,3363	224	1	
REFTSLR	10,3252	1358	1	1358			RMDINV	25,2244	524	7	
RESULTCT	55,1537	=	128	5	376	380	PN	1217	105	16	
RESUMF	5270	1121	26	161	1403		RND/TST	42,3543	437	3	
RETJADR	E6,1477	132	4	1435	1444		RADCCN	42,3302	423	2	
RETNDOPF	20,2456	1410	7	1405	1405		RNDPEFCR	07,3167	1305	3	
RETNDCA	06,2264	165	1	166			RNDVZBIT	4745	=	66	8
RETR00T	J132	=	98	3	817	819	RNDVZFLG	0310	=	66	7
RETURNJTJ	17,3521	1454	7	1452	1457		RNGFCDATA	0260	=	84	
REVCNT	6245	1000	5	254	1061		RNGEDPIT	4750	=	84	2
REVERFS	35,3136	670	1	670			RNCSBIT	4742	=	74	2
REVERSAL	21,3601	1473	1	1473			RNGSCFLG	0120	=	74	4

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
RPASS3	E7,1551	142	11 676 657	RRLCADIN	25,2000	= 32	1 492	RSCLPL	E7,1630	= 149	4 149 497
RPASS36	E4,1506	= 118	5 118 701	RRLIMCHK	4523	524	4 188 544	RSUBM	14,2002	45	1 928
RPCOMP1	34,3475	847	1 839	RRLIMK	25,2551	545	2 545	RTARE	E7,1443	140	9 141 769
RPCOMP2	34,3501	847	1 842	RPLIMCK	4560	525	2 525 546	RTARG1	E7,1471	= 145	11 686 690
RPCOTIME	E7,1427	139	1 865	RPLCSCSP	40,2017	300	2 300 301	RTB	01,2451	1082	1 1082
RPCOTCSW	E7,1430	139	1 871	RPLQSEVC	1100	= 575		RTB/ETLZ	01,2450	1082	1 1004
RPEP	0016	= 1264	3 727 1264	RRNR	23,2041	325	3 545 594	RTBCODES	10,2000	= 29	1 1387
RPPBFC	E7,1521	= 142	2 667 670	RRNBRT	4746	= 66		RTERM	0022	= 1258	2 1267 1269
RPGFLG	0170	= 78	6 1206 1230	RRNBMPAC	23,2065	325	1 300	RTHETA	E4,1604	= 116	10 116 706
RPGFLBIT	4735	= 78		RRNBSW	0011	= 66	5 541 569	RTIG	E7,1641	= 143	9 143 762
PPQV	E4,1504	= 115	8 115 1220	RRNB1	23,2054	325	1 325	RTMAG	E7,1722	= 144	5 144 770
RPRFXIT	0050	= 1140	3 1132 1134	PROUT	25,2317	537	3 536 607	PTML	E4,1720	118	4 636 693
RPPRXXXX	24,3715	1134	1 1132	RRCUTLIM	25,2346	538	1 537	RTNARSE	E5,1710	= 126	2 1192
RPSV	E4,1521	= 115	5 115 1222	RROULT	25,2321	537	1 538	RTNFCLE	E7,1617	= 150	4 150 769
RPTORA	26,3733	1132	1 1132	RRPANG2	25,3114	555	4 493 609	RTNLAMB	E5,1710	= 126	8 126 1189
RPTCPF	26,3725	1132	1 1133	RPRDCT	25,3112	555	5 493 608	PTNFRM	E5,1753	= 126	2 126 1179
RQVV	E4,1513	= 115	7 115 1222	RREFST	1312	106	5 106 536	RTASAVR	0145	= 98	3 1253 1254
RR-AZ	E4,1600	= 119	5 119 316	RRRSEIT	4751	= 86	1 573	RTNTR	E5,1710	= 126	1 1190
RR-FLV	E4,1602	= 119	2 301 316	RRRSFLAG	0300	= 86		RTNTT	E5,1710	= 126	3 1178
RRANGLES	13,2133	323	1 541	RREAF	E7,1735	= 147	3 147 584	RTCRPA	24,3721	1134	1 1134
RRANGFLT	40,2645	419	1 418	RRSCNLY	25,2255	535	3 532 534	RTORPB	24,3710	1134	1 1134
RRATE	E4,1632	= 116	6 116 705	RPSGAIN	25,2316	536	1 536	RTRN	E7,1465	141	7 652 663
RRATECF	E4,1437	= 131	1 1437	RPSPTCEP	40,2671	420	2 419 420	RTPNACDR	01,2566	1293	5 1293 1298
RRAUTCHK	06,3006	183	2 166	RRTARGET	1100	= 103	14 103 607	RTPNMU	10,2022	693	1 693
RROBRSIT	E7,1743	= 147	5 147 576	RRTONLY	25,2252	535	5 532 600	RTSR1/PL	E4,1716	118	4 118 693
RROUCHK	06,3037	185	2 183	RRTKRF	4570	526	2 615	RTSTBASE	E4,1775	120	3 278 492
RRCHECK	4576	526		RRTUN	E7,1733	= 147	3 147 586	RTSTDEX	E4,1773	120	6 278 493
RRODATA	4751	= 86	1 526	RRTURNON	25,2073	528	1 184	RSTLCC	E4,1776	120	7 277 493
RRODATAFL	0277	= 86		RRTZFC	25,2354	539	1 265	RTSTMAX	E4,1774	120	2 278 493
RROFSLUN	25,3015	553	1 553	RRTZFCCK	42,2136	265	1 265	RTX1	E5,1776	= 125	13 125 1215
RROFSEND	42,2277	279	1 262	RRTZERCEB	25,2102	529	2 528 539	RTX2	E5,1777	= 125	17 620 1215
RRTFSK2	42,2256	260	1 269	RRTZ	25,2401	539	1 539	RUFLAW1	17,3663	1458	1 1451
RRTFSK6	25,2256	545	2 269 513	RR1AXIS	25,2257	535	1 535	RUFLAW2	17,3671	1458	2 1458
RROFENK	43,2230	269	1 267	RR1AX2	25,2265	536	1 535	RUFLAW2	17,3717	1458	1 1451
RROFSSM	25,2404	540	3 511 554	RP2SGAIN	32,2776	607	2 606	RUFLAW3	17,3725	1459	1 1452
RROCTFLT	40,2662	420	1 418	RSAMPDT	E4,1777	120	7 277 492	RUFRAE	17,3776	1459	2 1458
RRECT	E3,1502	= 111	15 111 1231	RSRRC	E3,1432	110	2 196 216	RUFSETUP	17,3745	1459	4 1458 1459
RRECTCSM	E3,1554	111	11 111 1204	RSCALE	32,2177	210	1 210	RUNIT	E7,1743	= 152	8 152 891
RRECTHIS	E3,1626	= 112	4 298 1201	RSLFLBTS	05,3064	219	1 217	RUPDATED	33,3251	879	
RRECTLFM	E3,1626	= 112	3 112 1203	RSPHERE	13,3742	1238	2 1229 1230	RUPTACK	0022	95	6 95 1121
RRECTCTH	E3,1554	= 111	1 298	RSTACK	E4,1600	= 119	10 277 492	RUPTPFG1	0070	95	66 156 1398
RRTGIMC	06,3071	187	1 185	RSTCFGTS	21,3515	1472	2 1466	RUPTREG2	0071	95	26 162 1470
RRTMUEIF	43,2205	269	1 268	RSLBC	1100	= 103	3 496	RUPTREG3	0072	95	19 273 1470
RRIINDEX	1314	= 106	3 535 536	RSURE	14,2004	45	1 928	RUPTREG4	0073	95	7 95 1328
RRIINIT	06,2564	174	1 174	RSUBM	14,2000	45	2 928	RUPTSTOR	0063	= 95	

HEALTH KEY: NORMALLY DEFINED UNLESS FLAGGED AS FOLLOWS:

UN UNDEFINED = DEFINED BY EQUALS J DEFINED BY JOKER CR ERASE ANYWHERE MD MULTIPLY DEFINED
 BD BADLY DEFINED CD DEFINITION ASSOCIATED WITH CONFLICT XX MISCELLANEOUS TRUELE

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
RUP10RB	4065	155	1 155	R2	E5,1717	= 126	3 1176	R24LEM2	24,3217	517	1 518
RUTH	16,3127	1422	1 1422	R2C1	4320	462	7 474	R24LEM3	24,3235	518	1 517
RUTMYTAB	42,3124	318	1 315	R2VEC	E5,1662	= 126	10 126 1185	R24LEM4	24,3251	518	1 518
RUTMYTFM	1153	98	2 305 420	R21-5C3	24,2761	511	1 511	R29	33,2645	599	2 600 871
RVAPMIN	53,1774	113	1 581	R210ISP	24,3122	513	1 511	R25.LCS	33,2123	600	1 599
RVPOTH	33,2771	875	1 856	R21END	24,2770	511	1 511	R29/SERV	33,2600	= 34	1 598
RVCCN	13,3244	1208	1 1207	R21LEM	24,2675	510	1 500	R292	33,2552	871	
RVEC	E5,1654	= 126	10 496 1192	R21LEM1	24,2734	511		R25DLOOP	24,3362	602	1 602
PVQ	00,3274	1069	1 1015	R21LEM10	24,2726	511	2 510 513	R29COCES	32,2550	603	1 602
RVSW	1157	= 77	7 496 1178	R21LEM11	24,3106	513	1 512	R25CPAS1	32,2564	603	1 603
RVSBRIT	4743	= 77		R21LEM12	24,3011	512	1 512	R25CPAS2	32,2703	606	1 604
RWAITK	43,2141	265		R21LEM13	24,3034	512	1 512	R29CVEEG	32,2553	603	2 603 605
RXZ	E7,1721	= 146	10 146 591	R21LEM2	24,2732	511	1 554	R25DVEND	32,2600	603	1 603
R02	24,2700	= 28	1 1322	R21LEM3	24,2743	511		R29FXLCC	32,2775	607	1 604
R02R0TH	14,3236	1322	10 34 920	R21LEM4	24,3002	512	1 511	R29LCKCN	32,2753	607	1 607
R02ZFRD	14,3252	1322	1 1322	R21LEM5	24,2776	510	1 510	R25NOCES	33,2567	871	2 871
R04	43,2447	277	1 262	R21LEM50	24,3041	512	1 512	R29FRANCE	24,3443	609	1 609
R04A	43,2501	277	1 278	R21LEM6	24,2716	511	1 510	R29R0JCB	24,3413	608	1 608
R04B	43,2523	278	1 278	R21LEM7	24,3037	512	1 512	R29PEAC	24,3400	608	2 607 608
R04C	43,2540	278	2 278 261	R21LEM8	24,3044	512	1 512	R29REMCJ	33,2113	600	1 599
R04FAC	43,2635	280	6 278 279	R21LEM9	24,3076	513	1 513	R25RRF3	24,3466	609	1 609
R04FLAG	4743	= 70	7 71 520	R21SRCH	24,2775	511	1 511	R29S1	25,2000	= 32	1 600
R04FLEIT	4743	= 71	4 277 557	R22CISP	0314	= 59	6 315 590	R3C1	4321	462	5 404 459
R04K	43,2627	280	1 277	R22LEM	24,2445	506	4 508 509	R30LOC	22,2600	= 32	2 44 713
R04L	43,2631	280	1 278	R22LEM1	24,2515	507	1 507	R300K	27,3766	1273	
R04LP	43,2575	279	3 279	R22LEM12	24,2457	506		R31	37,2000	= 36	1 703
R04PP	43,2561	279	2 279	R22LEM2	24,2525	507	2 507	R31CALL	40,3737	703	1 284
R04X	43,2516	278	1 275	R22LEM3	24,2545	507	2 507	R31LCC	40,2000	= 36	1 703
R04Y	43,2611	279	2 279	R22LEM42	24,2631	505	4 501 508	R31SURF	37,3370	707	1 704
R04Z	43,2453	277	1 277	R22LEM44	24,2624	508	1 508	R33	42,2002	276	1 276
R1	1047	= 1192	19 638 1192	R22LEM45	24,2634	509	1 509	R36	04,2640	701	2 285 702
R1A	E5,1741	= 126	15 126 1192	R22LEM46	24,2642	509	2 508 509	R36INT	04,2660	701	1 702
R1C	E7,1724	= 144	4 144 711	R22LEM7	24,2612	508	1 508	R36LM	04,2000	= 28	1 700
R101	4317	462	13 404 1065	R22LEM93	24,2562	508	1 508	R36TAG2	04,2747	702	1 702
R15	E7,1572	= 148	14 148 883	R22LEM56	24,2566	508	2 590	R47	32,2000	= 34	1 207
R1SAVE	1073	103	4 223 1360	R22RSTR1	24,2654	509	1 240	R51	14,3007	934	1 923
R1VEC	E5,1654	= 126	6 126 1185	R22WAIT	24,2640	509	3 506 507	R51.1	14,3011	934	1 241
R10	21,2000	= 31	3 42 851	R23LEM	24,3136	515	1 499	R51.2	14,3047	934	
R10,P11	21,2116	823	3 240 854	R23LEM1	24,3144	515	1 516	R51.3	14,3050	934	1 936
R10,P11A	21,2021	823	1 867	R23LEM11	24,3155	515	1 515	R51.4	14,3137	935	1 935
R10FLAG	0015	= 66	1 831	R23LEM2	24,3177	516	2 515 516	R51C	14,3014	934	2 934 935
R10FLETT	4752	= 66	4 825 900	R23LEM3	24,2202	516	2 515 516	R51F	14,3045	934	3 934
R11	21,2000	= 31	2 823 829	R24END	24,3231	518	1 517	R51F	14,3034	934	
R12	33,2506	869	2 165	R24LEM	24,3207	517	1 512	R511	14,3035	934	1 934
R12STUFF	34,2000	= 34	1 886	R24LEM1	24,3213	517		R51K	14,3126	935	2 935 937

HEALTH KEY: NORMALLY DEFINED UNLESS FLAGGED AS FOLLOWS:

UN UNDEFINED = DEFINED BY EQUALS J DEFINED BY JOKER CP ERASE ANYWHERE NO MULTIFLY DEFINED
 RD PARTLY DEFINED CD DEFINITION ASSOCIATED WITH CONFLICT XX MISCELLANEOUS TROUBLE

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
R51PA3	14,2127	935	1 781	R77FNC	43,2651	280	1 263	SBIT15	4735	=	1275 1 1282
R52	14,2671	948	1 924	R77FLAG	1117	=	74 2 277 280	SBIT2	4752	=	1275
R52A	14,3701	948	2 943	949 R77FLRIT	4741	=	74 4 221 560	SBIT3	4751	=	1275
R52B	14,3707	948	1 948	R771N	25,2050	493	2 492 493	SBIT4	4750	=	1275 1 1279
R54	14,2250	=	938 2 935 963	=====	=====	=====	=====	SBIT5	4747	=	1275
R55	14,3216	938	1 935	S(X1)	0032	=	1193 6 1170 1176	SBIT6	4746	=	1275
R55.1	14,2223	938		S+7FRC	4755	=	1275 9 291 1281	SBIT7	4745	=	1275 1 1282
R55.2	14,3231	938	1 938	S+1	4753	=	1275 9 291 1283	SBIT8	4744	=	1275
R55CDB	14,3247	938	2 937 938	S+2	4752	=	1275	SBIT9	4743	=	1275 1 1279
R55CFT	14,3243	938	1 938	S+3	6250	=	1275	SENK03	5020	=	1276 1 1281
P56	14,2603	=	930 1 934	S+4	4751	=	1275	SCALACJ	25,3443	561	1 559
R59	15,2245	950	4 950 962	S+5	4756	=	1275	SCALCNG	25,3351	560	1 559
R59A	15,2257	950	1 951	S+6	6245	=	1275	SCALDCNE	21,3500	1472	1 1471
R59ALM	15,2427	952	1 952	S+7	4757	=	1276 1 1277	SCALECHK	25,3322	559	1 559
R59D	15,2375	952	1 952	S-7FRC	4754	=	1276 1 1280	SCALECCT	17,3352	1452	1 1452
R59F	15,2445	953	1 953	S-1	7752	=	1276 2 1281 1283	SCALEE	17,3340	1451	1 1451
P59DLT	15,2455	953	4 950 952	S-2	7751	=	1276	SCALEFAC	31,2005	40	2 789 813
R59RFT	15,3127	962	1 953	S-3	7750	=	1276	SCALELC	40,2657	420	2 420
R60INIT	32,3177	781		S-4	6115	=	1276	SCALEVER	32,2132	209	2 208
R60LFM	26,2123	475	6 341 949	S-7	5650	=	1276 1 1277	SCALLCCP	21,3464	1471	1 1471
R60VSAF	25,1620	=	123 5 123 781	SAMETYP	15,2573	573	1 973	SCALPREP	37,3711	1326	2 1325 1326
R61	23,2000	=	32 1 519	SAMPLIM	1077	103	9 223 565	SCALSAVE	0316	99	3 1325 1326
R61C+L01	23,2127	519	1 522	SAMPLSLM	1100	103	9 103 886	SCALSHFT	27,1720	=	146 4 146 590
R61C+L02	23,2152	520	2 519	SAMPTIME	0013	=	92 5 206 464	SCALSTRT	21,3456	=	1471 1 1471
R61C+L03	23,2156	520		SAVE	25,1464	=	128	SCAXIS	27,1764	=	147 27 144 551
R61C+L04	23,2302	522	1 520	SAVECDLT	23,1766	=	607 11 604 606	SCHZERCS	37,3056	389	4 381 384
R61C+L05	23,2236	521	1 521	SAVSDEN	27,3535	1268	1 1268	SCLNDRM	17,3141	1446	
R61C+L06	23,2261	521	3 521 522	SAVEFLAG	1071	=	1362	SCNDSCL	34,2776	644	7 636 644
R61C+L1	23,2307	522		SAVEHAND	26,1462	131	7 1424 1437	SCCLNT	1366	=	108 4 108 1280
R61C+L2	23,2275	521	1 521	SAVFLLCCP	10,2730	1352	1 1352	SCOUTEND	40,2736	421	4 421
P61C+L4	23,2305	522	2 521	SAVFLLCCS	10,2723	1352	2 1348 1351	SCRATCH	26,1746	=	133 2 1474
R61FLAG	0024	=	67 2 519	SAVESR	26,1505	=	123 2 1462 1474	SCRATCHX	0160	=	1486 5 1482 1486
R61FLBIT	4742	=	67 1 521	SAVST-30	27,1477	=	148 8 148 728	SCRATCHY	0161	=	1466 3 1462 1463
R61LFM	23,2116	519	4 498 518	SAVLEMV	27,1737	=	145 4 592 593	SCRATCHZ	0162	=	1466 4 1482 1483
R61LFM1	23,2162	520		SAVQPS2	27,1665	=	143 2 548 549	SD	22,2366	358	
R61LFM2	23,2220	521		SAX	25,1730	=	125 5 931 933	SDISPLAY	43,3130	291	1 1283
R61FST	26,2246	477	1 476	SEAND	42,2000	=	36 4 46 488	SECAD	22,2027	352	
R62	23,2700	=	32 1 487	SEANDANT	42,3606	488	2 281 491	SFCMAX	27,1573	=	142 5 667 669
R62DISP	23,2103	=	487 1 287	SEANDX	42,3743	490	1 490	SFCCN1	42,3257	423	1 425
R62FLASH	23,2103	487	2 487	SPIT1	4753	=	1275	SFCCN2	42,3271	423	1 423
P65CNTR	17,1745	=	147 5 505 560	SPIT10	4742	=	1275	SECO1	4777	=	756
R65LFM	23,2123	519	3 505 560	SBIT10	4741	=	1275 2 1281 1282	SFC15	36,3754	756	
R65WAIT	23,2314	522	2 520	SBIT12	4740	=	1275 1 1281	SEC15DP	36,3753	756	
P77	43,2437	277	1 263	SBIT13	4737	=	1275	SEC30CP	36,3755	756	
R77CHECK	25,3365	560	1 558	SBIT14	4736	=	1275	SFC45	36,3760	756	

HEALTH KEY: NORMALLY DEFINED UNLESS FLAGGED AS FOLLOWS:

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 BD BADLY DEFINED CC DEFINITION ASSOCIATED WITH CONFLICT XX MISCELLANEOUS TRCLEFT

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
SEC45CP	36,3757	756		SFTISSW	06,2703	180	7 166 1308	SEVEN	4757	1087	25 156 1485
SELECTSLR	17,3225	1447	3 1433 1444	SETLCC	01,2662	1099	3 1099 1103	SEAIL	1357	= 108	4 108 1277
SELECTMU	16,2000	693	4 625 666	SETMARK	10,2527	1349		SFCOM	42,2145	= 306	1 306
SELECTF	16,3535	1430	2 1427 1430	SETMAXCB	20,2130	1397	3 1397	SFCONST1	45,1467	= 128	
SELECTFYZ	16,3555	1430	1 1419	SETMGA	06,3736	692	1 692	SFCNOM	41,3053	430	2 417 422
SELFACRS	43,3266	1276	2 291 292	SETMINCB	20,2141	1397	6 515 1397	SFINAB	42,2464	312	1 306
SELFBRANK	01,3225	1138	1 1108	SETMCCN	13,2717	1202	3 1202 1230	SFINABR	41,3216	423	1 432
SELFCHFC	43,2000	= 36	1 1275	SETMCLR	10,2011	693	1 693	SFMXCAL	40,3114	424	1 434
SELFCHK	43,3357	1277	5 223 1277	SETNACD	4211	462	2 408 431	SFNORCAL	40,3117	434	1 434
SELFERRAS	1357	108	1 108	SETNACADR	4303	462	7 408 462	SFOUTAB	42,2556	314	1 306
SELFRET	1361	= 108	7 108 1277	SETNEQL	21,3354	1469	1 1469	SFCUTABR	41,2602	418	1 418
SELFSSUPR	40,2000	= 36		SETNORM	10,2535	1249	1 1347	SFRET	41,3070	430	
SENFIC	05,3751	689	2 684 688	SETQCVF	7006	1019	1 1022	SFRET1	41,3052	430	
SENFILLS	07,3125	1304	1 1313	SETQVVF2	7155	1024	1 1020	SFRCTMX	41,3040	430	5 411 434
SENSEGET	17,2146	1432		SETQPC	7616	1036	1 1002	SFRUTNOP	41,3032	430	5 417 434
SENSETYP	06,1510	132	5 1428 1452	SETQPS	33,3722	889	1 889	SFTIMEF1	0123	= 96	21 305 426
SENSEPR	17,3757	1459	2 1451	SETQPS1	33,3703	889	1 782	SFTIMEF2	0124	= 96	2 435 436
SENSTEST	17,3377	1452	1 1452	SETQCS2	33,3721	889	1 888	SGNAGREF	10,3613	1387	6 377 1209
SEPMIN	42,3435	425	2 423 424	SETPRIO	10,2511	1348		SGNCHECK	12,2562	1174	2 1174 1175
SEPMINRET	0144	= 97	2 425 426	SETPRPCS	33,2104	599	1 599	SGNCOM	40,2422	403	1 404
SEPSCRET	0144	= 97	2 425	SETRAC	23,2367	696	1 695	SGNCVCVF	00,2402	1049	1 1049
SFPPSC	42,3404	425	1 424	SETRADX	23,2402	696	1 696	SGNCFE	0123	= 96	3 403 404
SFPPSCNR	42,3417	425	3 423 425	SETRF	13,2560	1131	2 1125 1127	SGNON	0122	= 96	3 403 404
SEPSEF1	42,3412	425	1 425	SETRFX	0051	= 1131	2 1131	SGNRDCT	55,1754	= 126	2 126 1150
SERV	32,2100	= 34	1 861	SETRCUND	00,2272	1046	3 1046	SGNTAB	40,2443	404	2 403 404
SERVACDR	36,2107	= 741	1 748	SETRPCTR	25,2330	537	1 538	SGNT01	40,2124	424	1 423
SERVEXIT	32,3761	861	7 723 861	SETRREFR	25,2167	532	3 531 599	SGNST1	40,2462	404	3 404
SERVICER	33,2206	855	2 242 853	SETRFX	13,2573	1131	2 1131	SHAFTPC	26,3015	564	
SERVICER5	33,2100	= 34	8 29 887	SETSEANSF	17,3336	1451	1 1451	SHAFTCMC	1355	108	2 552 606
SEPVIFLE	27,3321	860	2 1373 1374	SETTIME	17,2615	1435	1 1435	SHAFTLIM	25,2575	546	1 546
SERVOUT	33,2400	858	3 857	SETTIME4	06,2074	158	1 161	SHAFTVAR	54,1410	114	1 565
SERV1	37,2700	= 36	2 852 864	SETTIME5	16,2152	1402	1 1403	SHFTFACT	32,3543	814	1 813
SERV2	22,2000	= 32	1 858	SETTPKE	4564	526	2 186 530	SHFTFLAG	56,1741	= 123	4 1471 1472
SERV3	27,2700	= 33	1 861	SETLPDSP	10,2213	1284	1 1284	SHIFTR1	23,2451	699	8 620 663
SERV4	34,2000	= 34	1 887	SETUPER1	37,3005	289	1 388	SHIFTR11	33,2767	874	3 875 876
SETAUG	40,2701	420	1 419	SETUP29C	33,2152	601	1 601	SHOLTS	41,3672	470	1 469
SETPRANK	13,3137	1204	4 1202 1203	SETUP7C	04,2374	234	1 228	SHCRTMF	7312	1028	11 401 1277
SETCPAPS	07,3136	1305	2 17 1202	SETUP71	04,2373	234	1 228	SHCRTMF2	7316	1028	1 878
SETCTR	21,3664	1458		SETVAC	41,3516	450	1 450	SHORTT	00,2017	1029	2 1002
SETEBANK	4313	462	2 411 422	SETW0	05,3554	984	3 984 986	SHCRTV	00,2121	1042	1 1002
SETGAMMA	13,2550	1130	2 1125 1127	SETXFLAG	07,2667	= 844		SHCW	37,2457	381	3 376 378
SETGLOCK	06,2465	171	4 170 171	SETXTACT	43,2105	263		SHOWSUM	43,3115	291	1 291
SETGMEX	13,2556	1130	1 1130	SETX2	26,2532	580	1 580	SHCW1	37,2461	382	1 382
SETIFLCS	13,2645	1201	8 237 1212	SET57	43,2346	272	1 277	SHLTDOWN	16,2163	1403	1 1400
SETINFL	06,2727	216		SFLDCCFC	04,2204	230	1 233	SICLCCF	43,3310	1276	1 1277

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 BD BADLY DEFINED CD DEFINITION ASSOCIATED WITH CONFLICT XX MISCELLANEOUS TROUBLE

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF KEYS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
SIGN	7667	1038	1 1673	SLAP1	05,2447	212	1 410	SCFTICN7	43,3351	1277	
SIGNACS	0163	= 1496	12 1488 1495	SLCTMU	10,2000	= 29	1 693	SOPTON10	43,3352	1277	
SIGNFIX	41,3065	423	2 473	SLTEPIF	37,3034	389	2 384 388	SOUPFLY	27,3071	390	
SIGNLCHK	25,2777	553	2 553	SLFFTS	4247	463	1 446	SCUTHP	F5,1421	= 128	3 128 377
SIGNMPAC	10,3713	1391	14 354 1270	SLCAC	6504	1011	1 1003	SPAPCSIN	30,3660	916	3 809 915
SIGNNET	0125	= 96		SLCAD2	6060	994	5 1011 1391	SPARE	0007	= 194	11 195 205
SIGNTEST	40,2446	404	2 402	SLCPBIT	4751	= 68		SPCCS	5032	1094	5 189 1251
SIN20AMP	25,2454	212		SLCFFH1	00,2314	1047	1 1072	SPECSYS	37,2572	385	
SINB	F5,1646	= 124		SLCPFLC	00,3007	1061	1 1073	SPECTEST	01,2652	1399	1 1103
SINBLANK	40,2572	416	1 406	SLCPFSW	0023	= 68	3 1174 1187	SPEEDRLN	21,2265	894	1 893
SINCDU	0725	= 100	6 100 1254	SMALL	00,3133	1065	1 1062	SPIPAL	1237	= 953	4 261 952
SINCDUX	0741	= 100	6 480 1256	SMALLEPS	27,2366	759	1 759	SPIREF	22,3541	= 718	1 37
SINCDLY	0735	= 100	5 480 1256	SMALLTJU	16,3713	1460	1 1460	SPNDX	1261	105	8 366 367
SINCDUZ	0737	= 100	7 480 1256	SMALL2	00,3062	1062	1 1065	SPSCCCE	4743	= 1299	
SINB	07,3531	1074	2 1074 1250	SMALPCIF	16,2507	1415	2 1415	SPSCCNT	20,2716	1480	1 1486
SINESLOC	23,3764	1254	1 1254	SMALPATE	17,3717	1458	1 1458	SPSIN	5033	1094	5 189 1251
SINGIMLC	26,2401	485	1 485	SMODT	1262	= 178	7 108 1277	SPSLCCP1	20,3112	1484	1 1485
SINI	26,2402	52	2 1136	SMODFCFK	43,3322	1277	3 1277 1280	SPSLCCP2	20,3127	1484	1 1485
SINNOPT	0010	= 1140	1 1136	SMPAC+	00,3405	1071	3 1171	SPSRCS	21,3730	1499	2 1428 1442
SINTH	0022	= 125	21 300 1244	SNAPAGN	05,3632	985		SPSSTART	21,3736	1499	1 1499
SINTHETA	F7,1731	= 146	3 147 590	SNAPEND	05,3651	986		SPT	5036	1094	1 1094
SINVEC1	26,2403	485	1 484	SNAPLOCP	05,3621	985	1 986	SPVAC	5116	1095	2 223 1251
SINVEC2	26,2405	485	1 484	SNGLOD	22,2376	358		SPVACIN	5112	1095	1 1095
SINZFCO	30,3652	915	1 915	SNTB	85,1727	= 126	14 126 1191	SQ	1076	103	2 1094
SIN60FEC	26,3704	596	2 593	SNLFFBIT	4737	= 74	1 1443	SQRT	00,3207	1068	1 1005
SIX	6245	= 1091	34 170 1477	SNUFFFR	0115	= 74	2 259	SQRTABRT	00,3402	1071	2 1071
SIXTY	43,3257	1276	1 1282	SNUFFCLT	43,3242	299	1 262	SQRTNEG	00,3273	1071	1 1071
SIZETA	01,2402	239	2 1296 1298	SN1	00,3553	1075	1 1074	SQRTM2	00,3475	1073	1 1073
SIZETST	42,3561	438	2 436 437	SN359+	35,2420	634	1 637	SQRTNCRM	00,3502	1073	1 1073
SKALSKAL	1253	108	1 877	SQR	0042	= 1140	4 1135 1136	SQRTSHFT	00,3221	1068	1 1068
SKEEP1	1371	= 108	20 108 1283	SQRLNSBIT	4751	= 75		SQRTSLE	00,3343	1071	3 1062 1076
SKEEP2	1372	= 108	10 108 1281	SCLNSW	0127	= 75	5 1185 1191	SR	0021	= 52	20 406 1474
SKEEP3	1373	= 108	14 108 1282	SCMPACS	20,3450	1490		SRCHCEIT	4736	= 68	1 592
SKEEP4	1374	= 109	14 109 1283	SCMPFRFR	37,3040	389		SRCHCFIN	0037	= 68	4 288 517
SKEEP5	1375	= 109	10 109 1282	SCMPKEY	07,2404	255	1 254	SRDCEV	00,2024	1039	1 1062
SKEEP6	1376	= 109	6 109 1283	SCMPFRP	27,3647	385	1 379	SRTST	00,3456	1073	1 1072
SKEEP7	1377	= 109	22 216 1282	SCPT	43,3726	1283	1 1283	SP30.1	22,3551	720	2 715 717
SKIPADD	10,2751	1353	1 1353	SCPTICN	43,3711	1282	2 1281	SS	F7,1732	= 144	9 770 771
SKIPDEL	20,3376	1489	1 1488	SOPTIONS	43,3333	1277	2 1277	SSF	6623	1013	1 1003
SKIPDR2	20,3462	1490	3 1489 1490	SCPTICN1	43,3343	1277	1 1277	STABL7	31,2511	754	1 753
SKIPPAXS	16,2734	1419	2 1418 1431	SCPTICN2	43,3344	1277		STACCCCT	20,2756	1481	2 1480
SKIPSIM	05,2456	212	1 212	SCPTICN3	43,3345	1277		STACK	6257	1006	1 1005
SKIPTPRF	22,3626	721	1 721	SCPTICN4	43,3346	1277		STALL	07,3711	1320	2 1319
SKIPU	F6,1535	134	9 134 1462	SOPTION5	42,3247	1277		STAR	F5,1730	= 124	8 124 959
SKIPV	F6,1536	= 134	3 1402 1462	SCPTICN6	43,3350	1277		STARAD	F5,1706	= 124	43 124 1246

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SYMBOL	DEF	F	REFERENCES	SYMBOL	DEF	F	REFERENCES	SYMBOL	DEF	F	REFERENCES
STARALGN	0735	100	2 100	STILBACH	E7,1674	= 151	4 151 885	SUPERSW	4727	593	3 1354 1373
STARARCF	0734	100	4 100	STILBADV	E7,1675	= 151	4 151 885	SUPER011	4773	1088	3 852 1301
STARIN	E5,1757	= 125	16 125	STILLRCS	17,2710	1442	3 1436 1442	SUPERICC	4745	= 1088	
STARIM	0040	= 125		STMIA-	20,3533	1491	2 1495	SUPER101	4775	1088	1 1091
STAPS AV1	E5,1761	= 125	12 125	STMP	0020	= 575	7 578	SUPER110	4776	1088	3 601 1091
STAPS AV2	E5,1766	= 125	8 125	STOPCLK	36,3017	738	3 737 738	SUPPCCN	42,3260	1276	1 1282
STAPTAP	14,2100	= 21	1 47	STOPFIRE	31,3510	808	2 808	SUPFACAN	07,2645	261	1 261
STARTCAP	16,2145	1401		STOPPRATE	20,2166	1358	10 285 1359	SURFDISP	15,3144	964	2 563 966
STARTDOES	25,2442	542	2 541	STOPRAC	27,2046	483	1 483	SURFEND	07,2641	261	1 261
STARTFR	5107	= 224	1 221	STOPRADS	12,2140	1167	1 1170	SURFFEIT	4744	= 75	9 214 855
STARTMAN	26,2176	476		STOPDEL	25,3145	670	2 665 670	SURFFLAG	0177	= 75	16 237 1203
STARTPIP	37,2161	376	1 376	STOPF	6425	1008	6 1007	SURFJCB	07,2604	260	1 258
STARTF47	36,3453	751	1 751	STORE,1	6417	1008	1 1007	SUPFLINE	15,3064	963	2 962 573
STARTP64	31,2566	795	1 791	STORE,2	6422	1008	1 1007	SUPPREJ	07,2507	257	1 257
STARTP66	31,2431	793	1 794	STOREMAX	12,2077	1167	3 1166 1167	SURFSTAR	15,2000	250	1 253
STARTP67	31,2503	794	1 793	STOREIN	12,2152	1167	1 1167	SURFSTCP	07,2521	258	1 255
STARTSBI	05,3114	220	1 217	STORETGC	27,2666	768	2 768	SURFSLP	15,3134	563	1 563
STARTSF2	05,3144	220	1 217	STORE1	6626	1013	1 1044	SVCT3	5240	1113	2 1113
STARTSIM	05,2452	212		STOREIS	26,3667	595	1 595	SVCTBX	5256	1113	3 1113
STARTSTO	6437	1009		STOPHAF	22,3600	720		SVDWN1	13,2114	322	3 258 1201
STARTSLF	05,3105	220	4 212 219	STOPHPR	22,3612	721		SVDWN2	13,2670	321	2 1148 1203
STARTSW	05,2451	212		STOPJUMP	6375	1007	1 1006	SVEXTAD	05,3461	926	1 825
STATE	0074	95	44 65 1085	STOPLP71	04,3630	1383	2 1383 1384	SVEXTADR	27,3256	861	1 860
STATEPIT	4747	= 71	1 1374	STOPOPK	16,3706	1460	1 1461	SW/	01,2517	= 1086	1 1074
STATEFLG	0067	= 71	5 575 1234	STOPV	20,3616	1492	1 1492	SWANDBIT	4741	= 77	3 731 851
STATEINT	13,2604	1200	3 240 1201	STOPY	27,2431	762	1 762	SWANDISF	0155	= 77	1 858
STATCLF	13,2026	237	1 1241	STRAT	14,2714	932	1 932	SWBIT	0131	= 57	5 1084 1086
STATEXIT	E4,1516	= 116		STRATEGY	14,2706	932		SWERANCH	6720	1016	1 1086
STATINT1	13,2613	1200	2 24 1201	STRATEGY2	07,2377	1311	2 1319 1314	SWCALL	4622	550	5 218 1082
STATQLO	14,2306	232	2 232	STRATEGY2	07,3403	1311	4 1312 1316	SWCHCLR	35,2535	662	1 662
STCLCK1	36,2667	735	1 734	STRITDLE	5671	1373	1 1373	SWCHSET	35,2513	662	1 662
STCLCK2	36,2670	735	2 735 781	STRTP66A	31,2437	753	1 754	SWIN1	05,3364	224	9 214
STCLCK3	36,2671	736		STSHCSUM	43,3543	1280	2 291 292	SWITCHES	01,2517	1064	1 1086
STCTP	27,2550	1477	1 1473	SUBDIVIDE	16,2263	1412	3 1414	SWRETURN	4631	950	9 244 1323
STCTR1	27,2553	1478	1 1473	SUBEXIT	E7,1670	141	22 624 703	SWSKIP	01,2600	1066	2 1086
STDESIC	25,2613	548	3 512 548	SUBLIST	0337	= 987	12 983 986	SWSTORE	01,2554	1065	2 1085
STDESIC1	25,2627	548		SUBTR	02,2702	1077	1 1078	SWWCRE	0130	= 57	2 1084 1085
STEER?	31,2411	807	2 791 806	SUFFECHK	12,3460	1138	4 1187 1188	SXA	01,2365	1075	1 1074
STEERBIT	4741	= 69	3 87 856	SLHALFA	22,2677	363	1 363	SYNCT4	06,2154	161	1 161
STEERING	36,3672	755	2 724	SLHALFAP	22,2717	363	1 363	SYSTEM	43,3101	251	1 263
STEERSW	0042	= 65	2 764	SUPDICAL	4651	991	2 442 1281	S1	0050	= 53	30 358 1245
STEPA	31,2422	793		SUPDXCHZ	5165	1108	6 284 1108	S10BITS	5012	= 1276	2 1278
STIKLAD	01,2211	295	1 295	SUPFRFR	16,2665	1418	1 1418	S13BITS	43,3261	1276	1 1282
STIKSENS	06,1444	131	8 213 1437	SUPFRFNK	0007	= 53	27 216 1371	S2	0051	= 53	45 323 1245
STIKSTRT	05,3056	219	1 219	SUPERJCR	16,2666	1418	2 1418	S24.9SEC	36,3150	741	1 728

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
S30.1	34,2000	619	1 617	T(X)	27,3735	1272	2 1269 1270	TCQCDLW	30,3462	911	1 917
S32.1F1	0132	= 75	4 635 644	T-UTHER	F3,1570	= 112	1 195	TCQR	E6,1457	121	3 1412 1438
S32.1F2	0133	= 75	4 635 644	T2250	15,2760	959	1 958	TCGSTAL	17,2050	564	2 563 564
S32.1F3A	0134	= 75	3 636 644	TAPLNTG	06,2037	158	1 158	TCSI	E7,1633	143	12 155 647
S32.1F3B	0135	= 75	8 636 644	TAPLTTF	E7,1562	= 150	7 150 821	TCSLEFP	00,3773	1368	1 1367
S32/33.X	34,3120	649	2 633 648	TARLTTLFL	21,3725	821	1 801	TCSLPTR	00,3734	1078	1 1076
S32/33.1	34,3100	648	2 626 631	TAC	7074	1022	1 1003	TCTSKCVP	4352	463	1 744
S32PIT1	4735	= 75		TAGSLB	01,2442	1081	4 1079 1080	TCWAIT	4352	463	1 450
S32PIT2	4736	= 75		TALIGN	F5,1774	= 125	5 125 568	TDEC	1114	104	5 104 1234
S32PIT3A	4737	= 75		TAKS	1136	103	28 103 636	TCECAY	E7,1740	= 144	1 764
S32PIT3P	4741	= 75		TANGNB	E7,1752	= 147	9 147 609	TCECAYFX	4770	1088	
S33/34.1	35,2674	667	2 631 662	TARGETER	E6,1476	= 131	4 1425 1438	TDEC1	0040	= 1238	57 208 1234
S34/35.1	35,3204	672	2 666 667	TARGETIV	12,3551	1189	1 1189	TDEC2	E7,1573	= 142	3 625 657
S34/35.2	35,3216	673	2 663 666	TARGETPEX	31,2400	792	2 804 819	TDELTA	E3,1520	= 111	13 111 1222
S34/35.3	35,3207	675	1 670	TASKOVER	5261	1121	81 166 1368	TDESIREP	F5,1670	= 126	5 126 1188
S34/35.4	35,3252	676	1 675	TAT	0014	= 1238	16 208 1215	TDISP	15,3333	967	1 967
S34/35.5	35,3432	678	2 663 666	TAU.	F4,1473	= 115	13 115 1224	TDISPSET	21,3663	819	2 797 801
S3435.23	35,3235	673	1 673	TALRCD	F5,1540	= 123	2 123 812	TCPCS	E5,1756	= 127	1 127
S3435.25	35,3237	673		TAUVERT	F5,1516	= 122	2 122 810	TCVEL	E5,1764	= 127	1 127
S40.1	27,2246	758	2 747 749	TBASE1	1052	102	4 728 1254	TEMK	1075	103	10 1094
S40.1P	27,2236	759	1 759	TBASE2	1054	102	6 476 1211	TEMP	F5,1441	= 128	
S40.13	27,2540	766	2 241 725	TBASE3	1056	102		TEMPACC	F5,1440	= 128	
S40.13D	27,2626	767	2 766 767	TBASE4	1060	102	4 234 736	TEMPRE	0064	= 1290	1 1289
S40.13DV	27,2653	768	1 768	TBASE5	1062	102	1 854	TEMPBECA	0073	= 1290	6 1285 1292
S40.131	27,2610	767	1 767	TBASE6	1064	102	1 736	TEMPFLSH	0074	100	3 225 1354
S40.132	27,2616	767	2 767 768	TBLILDEX	4767	1088	1 1500	TEMPFC	0061	= 1290	8 1285 1292
S40.132*	27,2621	757	1 769	TBLP	F4,1670	= 120	15 120 848	TEMPG2	0071	= 1290	3 1288 1291
S40.133	27,2647	768		TC	F3,1550	= 111	10 111 1231	TEMPNM	0063	= 1290	3 1285 1292
S40.134	27,2650	768	2 767 768	TCALARM2	43,3305	1276		TEMPNUM	E6,1742	= 132	2 1430
S40.136	27,2106	38	1 767	TCGSM	F3,1622	112		TEMPPOK	06,2525	172	2 172
S40.136_	27,2110	38	1 768	TCEANZIC	27,3753	= 1272	6 565 1267	TEMPOR2	0160	= 1362	10 1346 1356
S40.137	27,2641	768		TCOH	F3,1776	113	11 195 647	TEMPFP	0062	= 1290	6 1285 1292
S40.138	27,2661	768	1 763	TCFINDVC	4354	463	1 450	TEMPFES	0154	= 1298	5 1293 1298
S40.2.2	27,2413	762	2 747 745	TCGFTCAD	00,3762	1367	1 1368	TEMPFR	0070	= 1290	2 1285 1292
S40.8	27,2447	764	1 754	TCFCAPPR	F5,1470	= 122	3 122 820	TEMPF2	0072	= 1290	5 1288 1291
S40.9	27,2707	769	1 754	TCGFEFAK	F5,1434	= 122	2 122 804	TEMPRED	1163	104	7 475 835
S41.1	27,3267	777	4 745 752	TCGLAPPR	F5,1471	= 122	1 122	TEMPSW	0065	= 1290	8 1288 1291
S50	14,2510	= 928		TCGIBRAK	F5,1435	= 122	2 122 804	TEMPSWCH	0157	= 1298	3 1293 1298
S52.2	14,3620	946	2 923 940	TCLESM	F3,1674	112		TEMPSW2	0066	= 1290	4 1288 1291
S52.2.1	14,3640	946		TCMDVAC	4351	463	1 450	TEMPTIME	E5,1430	= 128	3 128 381
S52.2A	14,3631	946	1 945	TCP	F6,1445	131	3 1412 1425	TEMPVAR	E5,1667	= 127	3 1142 1143
S52.3	14,3651	947	1 923	TCPIA	43,3223	299	1 299	TEMP20	0155	= 1298	5 1293 1298
S8PITS	4357	= 1276	1 1283	TCPINAD	43,3226	299	1 298	TEMP31	E6,1737	= 131	6 1434 1435
=====				TCG	6745	= 1284	5 264 889	TFMX	1253	= 105	8 105 866
T	0036	= 1193	12 496 1188	TCQNKCO	00,3455	1072	1 1072	TEMPY	1254	= 105	5 105 866

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TEMZ	1255	=	105 7 105 866	TEFQ1	0016	=	1258 5 1267 1270	TICKTEF	22,3420	715	I 715
TEM1	0141		57 34 97 1355	TEFRP/RA	27,3427		1264 1 720	TICKTPFR	22,3410	715	
TEM2	0142		97 34 97 1365	TEFTALF	0030	=	1258 3 1262 1269	TIC	E7,1441	140	37 195 568
TEM3	0143		97 19 97 1250	TEFSW	0167	=	78 3 1267	TIG-0	36,2417	727	2 241 729
TEM4	0144		97 11 97 915	TEFSWEIT	4753	=	78	TIG-30	36,2300	728	2 241 727
TEM5	0145		57 6 57 514	TEFTEM	0044	=	1258 13 1267 1271	TIG-30.1	36,2270	727	1 727
TEH	4363	=	1091 10 209 1421	TEFTTICK	22,3453		716	TIG-30A	36,2275	728	1 727
TENDAPPP	E7,1424		139	TEFVSC	0024	=	1258 1 1261	TIG-35	36,2242	727	3 241 726
TENDPRAK	E7,1423		139 2 140 804	TEFX	0042	=	1258 7 1267 1270	TIG-5	36,2354	729	4 241 735
TENSFC	24,3116		513 1 512	TEFXTEST	27,3561		1268 1 1268	TIGACW	36,3245	748	2 733 747
TEPHFM	53,1706		112 10 113 1395	TEFZERCS	23,2523	=	1273 2 1267 1268	TIGSAVE	E7,1762	=	144 4 754 758
TERMASC	34,3464		847 2 846 847	TEF1/ALF	0026	=	1258 7 1262 1271	TIGSAVEF	E7,1764	=	144 2 754
TERMATE	10,3273		1360 1 1353	TEF1/4	23,2513	=	1273 4 1261 1267	TIGTASK	36,2573	723	1 724
TERMEXTV	5472	=	263 4 268 274	TEF	E7,1453	=	140	TICTASK1	35,3656	723	1 723
TERMNVEC	12,3640		1191 1 1191	TEG	E7,1516	=	148 35 148 848	TIMECFK	10,3322	1359	1 1359
TERMLTMP	0157	=	98 3 1254	TEGCCALC	27,2464		764	TIMECHK	22,3075	367	1 367
TERMAJ	36,3262		748 3 747 748	TEGCCOMP	32,3731		825 2 826 828	TIMECELT	13,3671	1216	4 1214 1215
TERPLAMP	E5,1757	=	126 2 1137 1189	TEGFFNCW	21,2404		1470 2 1469 1470	TIMEDIOL	04,3550	1362	2 1382 1385
TEST	01,2566		1086 1 1086	TEG1	E7,1501	=	829 2 828 829	TIMEDICR	04,3562	1362	1 243
TESTPIT	41,3572		459 3 459	TEGUMP	31,2315		789	TIMEGABL	21,3321	1468	2 1440 1481
TESTOCS	32,2673		605	TEETA	0024	=	125 11 535 1241	TIMEHOLD	1104	103	7 555 609
TESTLOCK	31,3643		819 1 819	TEETACCN	27,2411		760 1 758	TIMEINC	13,3643	1215	1 1216
TESTLOCKP	13,3261		1209 6 1207 1235	TEETAD	0221		95 22 95 1303	TIMEOVFL	12,2311	1170	1 1168
TESTNA	41,2046		408 1 441	TEETAN	E5,1452	=	129 1 125	TIMEP	0030	=	579 3 577 578
TESTOFUF	40,3230		436 4 433 443	TEETCMP	34,3554		848 2 827 848	TIMER	E5,1470	=	128
TESTVP	41,2041		408	TEETCRIT	E5,1550	=	122 2 123 827	TIMEFRAD	12,3557	1190	1 625
TESTXACT	43,2076		263 20 268 1278	THIRD	35,3644		684 2 669 847	TIMESTEP	11,3311	1228	4 1210
TESTY	35,2742		667 1 667	THIRTEEN	4761	=	1065 2 1062 1352	TIMETEST	01,3575	1254	1 1297
TET	E3,1516	=	111 30 111 1230	THISAXIS	23,2515	=	37 1 37	TIMETEST	12,2732	1178	5 496 663
TETCSM	E3,1571		112 5 112 1365	THISPREC	13,3060	=	37 2 701 715	TIMEEX	35,3211	670	2 668 670
TEULEM	E3,1642		112 4 112 1395	THISSHIP	22,3356		715 1 714	TIME1	0025	=	52 21 166 1359
TEUTHER	E3,1570	=	112	THISFIP	E7,1761	=	152 6 152 812	TIME2	0024	=	52 39 195 1387
TEUTHIS	E3,1642	=	112 1 710	THISVINT	13,2066		237 1 1215	TIME2SAV	0314	55	4 99 1227
TEVANT	1341		107 6 195 825	THROCHK	34,2656		643 2 642	TIME3	0026	=	52 4 220 1120
TEF	E4,1540	=	116 11 116 721	THREE	6250	=	1091 45 234 1448	TIME4	0027	=	52 4 158 220
TEF/ETNU	0036	=	1258 6 714 1265	THREE/E	12,3757		1237 1 1222	TIME5	0030	=	52 5 220 1411
TEFALFA	0032	=	1258 6 1262 1265	THREECEG	32,2546		575 1 575	TIME6	0031	=	52 7 1254 1447
TEFRANK	22,3327		714 1 713	THRESH1	36,2022		40 1 746	TIMEGM8L	21,3327	1469	1 1470
TEFCALLS	22,3545		720 1 720	THRESH2	6000		40 3 751 831	TIMSUPM	0016	=	1140 3 1137
TEFCNIC	27,3260		1261	THRESH3	36,2023		40 1 746	TIMSUPO	E3,1776	=	113 1 1137
TEFCNMU	27,3361		1261 1 720	THROTLAG	31,2004		40 1 788	TITEP	E7,1613	=	142 5 667 669
TEFDELG	0012	=	1258 2 1270 1271	THROTTLE	31,2144		786 2 807 813	TIX	01,2416	1080	1 1004
TEFELL	27,3653		1270 1 1268	THROTLIP	32,3740		830 2 828	TJCALC	17,3402	1452	2 1452
TEFELL1	27,3655		1270 1 1268	THTRUST	0055	=	93 5 212 830	TJETLAW	17,3304	1451	2 1428 1442
TEFNIP	0034	=	1258 6 1261 1270	TICKTEST	22,3430		716 2 713 716	TJETU	E6,1525	=	135 2 1453 1454

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 BC BARELY DEFINED CD DEFINITION ASSOCIATED WITH CONFLICT XX MISCELLANEOUS TRUCLE

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
TJLAW	17,2715	1442	1 1446	TRIPCLD	E7,1573	= 150	2 795 796	TSCALE	32,2174	= 210	1 209
TJLAWADR	17,3142	1446	1 1442	TRIPFTN	47,2207	435	3 421 435	TSCALEINV	4750	= 821	1 819
TJMTN	17,3774	1459	1 1457	TRMCDR	10,3634	1388	11 580 1183	TSEANS	17,2176	1433	1 1433
TJP	E6,1524	134	18 124 1460	TRPFRV	E5,1761	= 126	3 1187 1188	TSICHT	E7,1561	= 146	17 258 571
TJU	E6,1525	= 134	19 135 1495	TPSL1	4404	464	6 425 435	TSIGHT1	14,3154	936	1 524
TJV	E6,1526	= 134	3 1401 1445	TPLSH	00,3272	1069	1 1065	TSKOVCDR	01,3521	1124	1 1124
TJZERC	21,3767	1500	2 1500	TR*GL**P	23,3562	1250	1 1250	TSLETCC	30,3604	914	1 914
TLAND	E6,1410	= 122	6 122 925	TPACE1	40,3272	443		TSLC	7621	1036	1 1003
TLIM	E6,2514	172	1 163	TPACF15	40,3303	443		TSLOCLOP	00,2201	1044	1 1044
TLCAE	6473	1011	3 354 1051	TPACKBIT	4747	= 68	14 281 1305	TSLOCTEST	00,2207	1044	1 1044
TM	E6,1733	= 136	4 365 368	TRACKFLG	0031	= 68	6 288 705	TSLOC2	00,2172	1044	1 1036
TMANUCFK	22,3064	367		TRAKFKEV	E7,1703	= 151	2 151 893	TSNEXTE	16,3014	1420	4 1415 1420
TMARK	E5,1432	= 128	4 128 381	TRAKLATV	E7,1702	= 151	5 151 659	TSNEXTS	17,2226	1433	
TMXJTL	E5,3703	586		TPANSM1	E4,1400	= 118	2 118 387	TSNUMBRT	17,2216	1433	1 1436
TMFAIL2	14,3347	1329	2 1320	TRANSPCS	22,2226	357	1 352	TSSL	00,2101	1041	2 1039 1048
TMFI	E6,1703	= 136	9 353 354	TRANSTM	E7,1662	= 149	3 145 457	TSPP	00,2025	1035	
TMIN	34,2111	635	2 644	TRANS4	17,2352	1436	1 1433	TSTAB	40,3703	472	1 473
TMINDEX	1336	= 99	7 99 587	TRAPEDP	E6,1430	130	11 130 1415	TSTART82	E4,1634	= 116	7 340 715
TMIS	E6,1703	= 136	15 136 352	TRAPFIC	E6,1431	= 130	6 1401 1416	TSTCON1	41,3667	470	1 469
TMOCF	5502	1011	1 422	TRAPFEP	E6,1432	= 130	6 1401 1416	TSTCON2	41,3670	470	1 469
TMOTOSFT	33,2440	867	1 856	TRPDES	E7,1666	= 151	6 757 820	TSTCON3	41,3671	470	1 470
TMRESUMF	E5,3705	986		TREFFSCL	31,3731	821	1 820	TSTFBANK	27,2232	744	1 744
TNEWA	E7,1431	135	2 754	TRG*NBEM	23,3666	1252	5 250 560	TSTFCRCP	41,2470	416	1 415
TNCTEST	E6,2227	164	1 162	TRC*SNBN	23,3659	1252	2 575 850	TSULTS1	41,3642	465	1 465
TNUV	E7,1526	= 111	12 111 1233	TRIG1	23,3335	1241	1 1241	TSULTS2	41,3673	470	1 469
TOPALL	26,2142	475	1 475	TRIG2	23,3346	1241	1 1241	TSULTS3	41,3700	470	1 470
TOPALLA	26,2144	475	2 476	TRIMACCL	31,2000	39	1 805	TSULTS4	40,3534	452	1 471
TOPALLC	26,2165	476	1 476	TRIMDCNE	01,2325	297	1 775	TSTCRE	6457	1005	1 1005
TOPCAN2	5417	1289	1 1290	TRIMGIMP	27,3217	774	1 257	TSTPRINT	23,3757	1254	
TOF-FF	27,2000	= 33	1 1261	TRIPA	E5,1664	= 127	5 127 1143	TSTRLSRM	13,2575	1131	1 1131
TOF-FF1	27,2000	= 33	2 46 1273	TRKFLCDL	06,3070	186	2 186	TSTRT	E7,1611	= 142	3 284 703
TOFAP	25,3557	570	1 570	TRKFLCN	4601	527	2 526 615	TTMP	E6,1707	= 136	8 366 369
TOFRACE	22,2724	364	1 352	TRKMKCNT	E7,1462	140	11 140 1213	TTF/8	E7,1642	= 150	20 150 669
TOFRACI	22,2742	364	1 353	TRMTRACK	42,3041	288	2 262 596	TTF/PCL	31,3741	801	3 791
TOPSELDO	17,2553	1438	1 1438	TRMTRAK1	42,2054	288	1 288	TTF/ETMP	E7,1552	= 150	5 150 797
TOPKJET1	20,2000	42	2 1480	TRNSPSPD	22,2335	357	1 353	TTFCISR	E7,1475	= 148	4 148 820
TOREGCONS	20,3151	1485	1 1485	TRUEF30X	12,3172	1183	1 1182	TTFINCR	31,2603	796	4 791 795
TOREQNDX	E5,1440	= 129	8 374 389	TRUNBC	26,3111	585		TTFSCALE	4740	= 821	
TOREQP	37,2117	375	1 369	TRUNNCD	1354	108	4 536 606	TTFRCT	E7,1617	= 150	3 150 788
TOCTATER	43,2162	266	2 262 266	TOUNVAR	E4,1411	114	1 586	TTG	E4,1666	= 120	4 120 839
TPAGREF	7262	1028	15 276 1387	TRYCLNT	25,3200	557	1 557	TTGALIS	E6,1742	= 134	10 1454 1457
TPASS4	E7,1630	143	9 195 771	TRYGTS	17,2622	1435	1 1432	TTGCG	E7,1453	140	26 140 845
TPDVI	6613	1013	1 1013	TRYSWN	25,2534	545	1 545	TTOTIG	1271	106	2 317 557
TPFDLICK	22,3460	716	1 716	TRYSW5	25,2472	544	1 541	TFP1	E7,1635	143	15 155 670
TPIP	E7,1624	= 150	5 150 756	TRYLGRV	16,2753	1415	1 1420	TFP10	E7,1637	143	3 626 621

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
TURNITCN	35,3725	741	1 740	UHYF	E7,1717	= 152	7 152 895	UPCCUNT	1172	= 104	5 104 1380
TURNOFFQ	16,2714	1418	1 1419	UHZP	E7,1725	= 152	6 120 896	UPDATRIT	4745	= 67	1 508
TUPNCFER	16,2724	1419	1 1418	UJFCTR	E6,1770	= 138	4 1402 1495	UPDATCHK	33,3117	877	2 865 870
TURNON	17,3154	1446		ULC	E7,1723	= 146	8 146 589	UPDATEVG	36,3615	754	2 750 755
TURNONET	4753	= 86	1 528	ULLAGER	4746	= 88	3 735 1433	UPDATE2	04,2000	= 28	2 1216 1379
TURNOFL	0312	= 86		ULLAGFLG	0314	= 88	2 225 735	UPDATEFLG	0027	= 67	10 288 681
TWEC	0732	= 1238	4 1226	ULLAGOFF	36,2566	733	1 241	UPDATIME	42,2016	276	1 276
TWFKIT	0750	= 1195	4 1174 1188	ULLGNCT	36,2327	728	5 723 728	UPDATNA	41,2322	412	3 441 456
TWFLVE	5741	= 1474	1 1471	ULLGTASK	36,2350	729	3 239 738	UPDATCFE	43,3076	290	1 263
TWIDDLE	5173	1111	26 376 555	ULCS	E4,1710	= 118	6 667 675	UPCATRET	0117	= 56	3 412 413
TWC	4752	= 1091	110 37 1455	UMPAC+	00,2170	1066	2 1066	UPCATVB	41,2342	412	10 405 456
TWOPT	35,3640	684	5 625 673	UMPAC-	00,3162	1066	2 1066	UPDAT1	41,2347	413	2 412 445
TXC	E7,1653	= 153	4 152 844	UN	E5,1673	= 126	9 126 1191	UPENLIST	05,2407	= 154	
TX789	E7,1471	= 146	3 146 1145	UNAJUMP	00,2000	1005	1 1002	UPETCALL	22,3206	369	1 368
TYPER	16,2567	1430	1 1431	UNFC/2	E6,1653	= 137	19 137 903	UPETMENT	42,2032	276	
TYPERCLV	17,3263	1448	2 1448	UNFV/2	E6,1667	= 137	5 137 903	UPETPFAS	4756	= 1381	1 1282
T1TCT2	E4,1652	117	6 118 644	UNFVLIM	20,3752	918	1 912	UPEND70	04,3704	1385	1 1382
T2A	30,3007	= 850	1 847	UNFVX/2	E6,1667	= 137		UPEND71	04,3613	1383	1 1382
T2TFST	30,2452	840	2 839 846	UNFVY/2	E6,1671	= 137	3 905 906	UPEND72	04,3645	1384	1 1382
T2TQT3	E4,1654	117	5 317 644	UNFVZ/2	E6,1673	= 137	3 905 906	UPEND73	04,3517	1381	
T3	30,3111	850	1 841	UNIT	00,3023	1062	3 604 1392	UPENT2	10,3545	1364	4 1252 1258
T3RPTB	4057	155	1 154	UNITR/	E7,1536	= 148	35 148 896	UPERRCR	43,3761	1378	1 1378
T3RUP1	01,3410	1120	2 154 155	UNITEV	00,3151	1066	3 1064	UPERRCLT	04,3741	1386	4 1278 1285
T3RUP2	01,3415	1120	1 1121	UNITGCRU	E7,1520	= 148	2 773 873	UPFLAG	5504	1365	75 266 1382
T4JLME	06,2116	160	2 159	UNITNCEM	04,2136	1180	1 1180	UPENDVAC	04,3525	1382	1 1381
T4PPTB	4064	155	1 154	UNITX	23,2521	1092	13 37 1092	UPJOB	04,3532	1382	1 1382
T4PUP	16,2000	= 29	2 156 157	UNITY	23,2517	1092	5 37 890	UPLIM	12,3277	1186	1 1185
T4RUP1	16,2000	156	2 154 155	UNIT2	23,2515	1092	10 37 873	UPLQANTV	04,3477	1381	2 1379 1380
T5ADP	1263	125	5 154 1481	UNKNOWN	0007	= 194		UPLCCBIT	4750	= 78	3 1329
T5TEMP	0161	= 138	1 149	UNLR/2	0024	= 151		UPLCCFL	0164	= 78	
T6ADP	4055	155	1 154	UNLRB/2	0024	= 151		UPMNSVCC	04,2224	1217	1 1216
T6FUTHA	E6,1470	131	11 1394 1447	UNP26	E4,1614	= 118	3 701	UPAFG	7564	1035	1 1035
T6JCB	17,2701	1394		UNP6	E4,1660	= 118	7 668 677	UPCK	04,3332	1329	
T6JQBCHK	17,2055	1394	1 1395	UNSTR1	10,3361	1359	1 1358	UPCLDMCE	1170	= 104	3 104 1284
T6NXT	E6,1466	131	12 22 1447	UNCLSPEN	04,3542	452	1 452	UPCLT	04,3672	= 1384	7 1379 1386
=====	=====	=====	=====	UNVFC	E7,1543	= 142	5 650 651	UPDUT4	04,3673	= 1381	3 1380
U=SCAXIS	27,2134	484	1 484	UNWC/2	E6,1661	= 137	10 137 905	UPPART2	04,3362	= 1379	1 1379
UAXCIST	0141	= 1495	2 1492 1493	UNWLOOP	21,3367	806	1 807	UPFAPT3	04,3543	= 1382	
UAXIS	20,3222	1488		UNWTEST	30,3510	912	2 906	UPPOS	7554	1035	1 1035
UCSM	E7,1636	= 149	3 149 456	UNX/2	0000	= 127	7 905 912	UPFSV	24,2312	501	2 500 512
UDB1	0135	= 1495	2 1492 1493	UNY/2	0006	= 127	1 906	UPPSV1	24,2332	502	1 502
UDB2	0136	= 1495		UNZ/2	0014	= 137	8 905 916	UPPSV3	24,2364	502	1 502
UDP3	0140	= 1495		UNZ2	E6,2312	166	1 167	UPFSV4	24,2345	502	1 502
UDB4	0137	= 1495	2 1492 1493	UPACTCEP	04,3746	1386	2 1384 1386	UPPSV5	24,2327	502	1 502
UPERRR	E6,1751	= 132	3 132 1442	UPPLF	1173	= 104	29 205 1385	UPPSTEE	4060	= 155	1 154

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
UPRPT1	04,3313	1329		U1PCS	22,2250	355	1 355	VATT1	0024	= 1238	14 205 759
UPRPT2	04,3313	1329	1 154	U2	E5,1711	= 126	5 126 1190	VBAD	23,3627	866	1 885
UPSTORE	04,3501	= 1381	1 1381	U2PCS	22,2224	355	1 355	VBCARK	42,2172	267	1 262
UPSVFLAG	03,1511	= 111	6 111 1217	U3PCS	22,2274	356	1 356	VEFANCI1	41,2146	409	1 435
UPTMP	1166	104	12 104 1384	U4PCS	=====	=====	=====	VBAS	E5,1620	= 123	3 793 812
UPTFST	04,3253	1325	2 1325	V	E7,1526	= 148	21 148 895	VEPROC	40,3476	450	5 410 458
UPTHCT	32,3662	828		V(CSM)	E3,1725	= 121	7 601 875	VBFELOC	40,3524	452	1 399
UPTHCT1	32,3667	828	1 828	V-CTHER	E3,1725	112	5 121 222	VBRESEQ	40,3521	451	1 410
UPTHEAST	06,2676	179	1 182	V/SC	7627	1037	1 1037	VBREFG	E5,1410	= 122	2 122 820
UPVARR	1171	= 104	5 104 1382	V/SCDV	00,2750	1060	2 1059	VBREFG*	E5,1424	= 122	2 122 821
UPVARRSV	1165	104	2 1378	V/SC1	7635	1037	1 1037	VBROEXC	41,3474	449	1 410
UPVERIFY	04,3444	1380	3 1380 1381	V/SC2	00,2654	1058	1 1037	VBROWAIT	41,3520	450	1 410
UPVRYM	04,3500	1381	1 1381	VACDSP	10,2660	1351	1 1351	VPSP1LD	41,3012	429	2 427 428
UPWAKE	04,3535	1382		VACFCLND	01,2621	1058	5 1098	VESP2LC	41,3013	429	2 427 428
UP1	04,1660	117	11 118 651	VACSTOR	07,2526	258	1 255	VESP2LC*	40,3523	451	1 451
UP21	4362	= 1381	1 1380	VACT1	E7,1471	142	4 145 645	VESP3LD	41,3014	429	1 427
UP71	4755	= 1379	1 1378	VACT2	E7,1512	142	3 639 651	VPTERM	40,3504	450	2 410 457
UP71	4753	= 1379	1 1379	VACT3	E7,1543	142	13 142 667	VB1STLTS	41,3621	465	1 410
UP72	4752	= 1379	1 1378	VACT4	E7,1565	142	6 143 639	VBUE	0122	56	71 56 1455
UP73	6251	= 1379	1 1378	VACX	E4,1537	= 115	1 115	VB7ERC	43,2124	265	1 262
UR	0000	= 491	1 49	VACY	E4,1541	= 115	1 115	VB04N12	26,2117	341	1 340
URATCIE	06,1426	= 131	5 1427 1435	VACZ	E4,1543	= 115		VB05N06	15,3634	974	1 968
URP	0006	= 491	2 490	VAC1	0401	100		VB05N09	5006	= 923	3 934 965
URPV	0016	= 123E	8 1225 1238	VAC1AERC	05,3351	223	1 222	VB06N18	26,2120	341	1 341
URRECT	E5,1646	= 126	4 126 1171	VAC1USE	0400	100	4 222 1058	VB06N93	37,2472	382	1 382
UR1	E5,1721	= 126	11 126 1191	VAC2	0455	100		VB56CADP	6030	556	1 556
USEACT	41,2105	408	1 4 8	VAC2USE	0454	100	3 222 1098	VB6N5	14,3320	540	1 535
USECOS	30,3641	915	1 915	VAC3	0531	100		VB64	43,2721	281	1 262
USEGTS	33,2336	857		VAC3USE	0530	100	3 222 1058	VB67	31,2000	= 34	1 611
USEJETS	33,2375	858	4 857	VAC4	0605	100		VB67A	30,2000	= 34	1 612
USEMAXDT	13,3335	1209	1 121	VAC4USE	0604	100	3 222 1058	VB67DEX	4765	= 737	1 734
USEPICS	13,3002	1203	1 1203	VAC5	0661	100	1 1298	VB67DEX	4760	= 737	1 730
USEQREFLG	0204	= 87		VAC5USE	0660	100	3 222 1098	VCV	E3,1542	= 111	21 111 1231
USEQRTS	4736	= 97	6 753 1481	VAC	6754	1018	1 1003	VCVCS*	E3,1614	112	1 582
USEPRIO	0163	= 1363	2 1349 1355	VALM1S	37,2263	378	1 389	VCVLFM	E3,1666	112	2 502 562
USEVF	33,3430	881	1 881	VALTCFK	33,3456	682	3 879 882	VDE	17,2533	1438	1 1438
USPRCADR	4713	992	7 6 4 1250	VAL67	05,2043	52	2 577 578	VDEF	00,3232	1069	1 1005
UT	E7,1672	144	10 144 762	VAPFG	E5,1444	= 122	1 122	VCC	E5,1410	= 820	1 802
UTIME	21,3736	1499	1 1498	VAPFG*	E5,1460	= 122	1 122	VCGVFRT	E7,1644	= 151	3 793 812
UV	0154	= 1496	7 1498 1495	VAPREC	E7,1505	= 142	2 667 670	VDC2TTF	E5,1424	= 821	1 801
UXVECT	E7,1717	= 145	7 145 555	VAPADAR	25,2060	493	1 492	VD1	4360	463	15 223 1051
UXVECTP	0014	= 596	3 593	VAPALARM	5734	1374	4 181 1222	VF	E4,1664	= 120	6 120 835
UYVECT	E7,1725	= 145	6 145 555	VAPDELAY	5224	1111	11 165 1302	VEARTH	E5,1706	= 124	6 124 955
UYVECTPP	0022	= 596	2 592	VARIANCE	E5,1706	= 127	12 127 1142	VFCACREE	00,3010	1061	4 1058 1392
UZ	0024	= 1298	4 1225 1227	VATT	0006	= 1238	23 565 1215	VFCANCI	26,2407	485	1 484

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
VEGANG2	26,2411	486	1 484	VFLSHRIT	4752	= 84	1 823	VNO655	35,2120	= 625	1 624
VECLEAR	27,2143	493	1 493	VFLSHFLG	4262	= 84	2 880	VN1	E7,1552	= 148	7 148 1215
VECCFANG	22,2723	363	2 363	VG	F7,1706	= 144	6 144	VN1645	35,2515	= 660	6 618 693
VECPMT1	27,2032	483	1 521	VGAIN*	27,2455	= 764	1 773	VN2	E7,1656	= 150	4 151
VECPMT2	27,2135	483	1 483	VGRDXY	E7,1501	= 148	10 148	VCK	26,2666	= 582	1 582
VECPPOINT	27,2140	483	2 341 476	VGCISF	E7,1663	= 143	4 215	VOK1	26,2727	= 582	1 583
VECPPT	27,2009	= 32	1 482	VGPREF	E7,1700	= 144	8 240	VCK2	26,2731	= 583	1 583
VFCQTEMP	F6,1725	= 137	4 483 485	VGTTG	E7,1700	= 144	10 144	VONE	E4,1614	= 116	5 705 1261
VFCSGNAG	16,3773	1352	2 217	VGL	E7,1626	= 150	9 150	VONF*	E4,1567	= 115	3 1261 1267
VECS1FT	22,2441	698	2 627 650	VGVECT	F7,1645	= 153	6 153	VCFEED	06,3231	= 193	1 192
VECTAB	F4,1521	= 115	10 115 1236	VHRCOMP	32,3526	= 813	1 810	VPASS1	E7,1505	= 142	6 142 645
VECTABND	F4,1574	= 115		VHCRIZ	F4,1662	= 120	4 120	VPASS2	E7,1527	= 142	5 142 650
VFC1	F6,1646	= 137	8 137 974	VHZ	F7,1704	= 151	4 152	VPASS3	E7,1557	= 142	8 641 697
VFC2	F6,1654	= 137	6 962 974	VHZ	E7,1705	= 152	4 152	VPASS4	E7,1505	= 145	2 663 672
VEHUPBIT	4744	= 67		VIGN	F5,1472	= 122	2 122	VPC	0000	= 923	
VEHUPFLG	0126	= 67	13 289 1148	VINIT	E4,1730	= 119	5 674	VPDVL	6576	= 1013	
VELCHK	25,3232	558		VINJCM	34,3366	= 835	1 832	VPPREC	E7,1527	= 142	2 667 670
VELCCNV	21,2703	42	2 856 857	VINTFRIT	4751	= 71		VPRCJ	7430	= 1033	1 1002
VELDABIT	4745	= 67	2 879 885	VINTFLAG	0071	= 71	27 237 1233	VRATECIE	F6,1427	= 131	3 1438
VELDATA	0255	= 84		VIPRIME	F4,1736	= 119	7 663	VRECT	E3,1510	= 111	11 111 1231
VFLSC	37,3101	390	1 386	VJETCTP	F6,1771	= 138	3 138	VRECTCSM	E3,1562	= 111	2 834 975
VFLUPDAT	33,3257	875		VLAUN	F5,1510	= 129	5 387	VRECTLEM	E3,1634	= 112	
VFRP	40,2354	403	1 399	VLAUNS	F5,1462	= 129		VRICT2	00,2242	= 1046	1 1046
VERBFAA	41,2133	409	7 438 411	VLIGHT	25,3626	= 615	1 615	VRCTATEX	7423	= 1032	3 1042 1064
VERBMASK	4144	= 1362	1 1347	VLITE	4751	= 616	2 615	VROUNC	7143	= 1024	6 1032 1033
VERBACUN	F7,1615	142	4 623 662	VLCAD	6510	= 1011	1 1003	VRTSTART	31,2470	= 794	1 794
VERBREG	1000	111	21 223 460	VLCAD*	6112	= 1091	1 1010	VSCATE	32,2201	= 210	1 209
VERPSAVE	1040	102	2 468 448	VLCADCCD	4735	= 1091	1 1010	VSELECT	E7,1651	= 150	11 150 885
VERPTAE	41,2151	409	1 409	VMAX	F4,1405	= 114	1 550	VSFLECT*	0131	= 123	3 881
VERR37	04,2000	= 28	1 225	VMEAS	E7,1652	= 150	4 150	VSHRRND	00,2073	= 1040	4 1042 1078
VERR69	43,2037	262	1 262	VMFASCHK	33,3252	= 875	5 877	VSHP2	00,2060	= 1040	1 1040
VERR85	43,3250	300	1 263	VMDCF	6524	= 1011	2 1033	VSG	00,3245	= 1065	1 1005
VERR96	43,3227	259	1 263	VMCNITER	21,2611	= 857	1 900	VQSUB	00,3317	= 1070	3 1062 1065
VERIFF1*	4751	= 78	1 1381	VMDON	F5,1722	= 124	8 125	VSSL	00,2145	= 1043	3 1042 1048
VERIFLAG	0165	= 78		VN	1225	= 105	10 156	VSSR	00,2127	= 1042	1 1046
VERIFYMK	17,2444	255	1 255	VNCON	43,3145	= 292	1 291	VSTILEAD	33,3630	= 886	1 885
VERPDR	E6,1752	= 132		VNSPCON	40,3352	= 445	1 445	VSTCRF	6446	= 1009	
VERTDISP	31,3502	808	1 792	VNORCOL	43,2255	= 269	1 269	VSL	6752	= 1018	1 1003
VERTDRET	37,2221	377		VNORCOL	43,2226	= 268	2 268	VSLBC	E3,1760	= 113	3 456
VERTGUID	31,3514	809	3 791 794	VNLCDDT	42,2034	= 276	1 276	VSLA	F5,1714	= 124	7 124 978
VERTSKIP	37,2534	384	1 384	VNLCDGYR	43,2412	= 274	1 274	VSTARGET	F5,1702	= 126	4 126 1185
VEX	F7,1742	144	3 747 765	VNPLAN	15,2560	= 555	1 554	VTARGET	E5,1701	= 126	5 126 1185
VFAIL	33,3537	883	2 883	VAPCCH	35,3621	= 683	13 617 675	VTIG	E7,1647	= 143	7 143 762
VFLAG	0062	= 70	4 93 923	VNO611	25,2065	= 624	1 625	VTPRIME	E7,1565	= 143	4 663 690
VFLAGBIT	4742	= 70		VNO641	37,2473	= 382	1 374	VUFDA1	33,3377	= 881	1 880

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
VUPDATED	33,3455	882		V06N37	35,3632	684	2 625 662	V16N72	43,2663	280	1 279
VV/SC	7632	1037		V06N42	35,2033	618	1 617	V16N78	43,2664	280	1 279
VVAFM1A	F3,1775	113	1 582	V06N43	24,2672	657	1 657	V16N80	24,3254	518	1 517
VVFC	F5,1743	= 126	15 126 1152	V06N43*	34,3342	785	1 784	V16N88B	26,3765	756	4 728 750
VVFCT	F7,1706	= 152	16 152 855	V06N48	F1,2337	297	2 296 297	V16N85C	34,3474	847	1 847
VVXSC	7407	1032		V06N49NB	24,2666	509	1 509	V1683	36,3766	756	1 752
VXBFAFMB	F4,1644	= 117	2 117 890	V06N51	42,3765	491	1 490	V2	0022	= 933	
VX1AF	1250	= 83	2 83 884	V06N55	35,3633	684	2 625 682	V2FC	F5,1510	= 122	2 122 810
VXINHPT	4740	= 83	1 884	V06N58	25,3634	684	1 683	V3	0030	= 933	
VXM	7242	1030	1 1030	V06N59	35,3635	684	1 679	V34TON45	24,2607	508	1 509
VXM/VXV	7345	1031	1 1031	V06N60	21,3740	821	1 808	V37	04,2014	228	2 295 449
VXRCM	F7,1703	= 145	3 145 595	V06N61	36,3152	742	1 737	V37BAC	04,2067	228	1 233
VXSC	7404	1032	1 1032	V06N63	21,3736	821	1 308	V37FLAC	0162	= 78	1 859
VXSCAL	33,2015	41		V06N63*	20,3020	850	1 843	V37FLEIT		= 78	3 229 1373
VXV	7462	1034	2 1034 1257	V06N64	31,3737	821	2 808	V37KLEAN	05,2650	215	2 231 1373
VYBFAMNB	F4,1536	= 117	3 117 890	V06N68	42,2257	272	2 272	V37NANC	04,2324	223	1 229
VYSCAL	33,2014	41		V06N71	07,2625	260		V37N95	04,2037	226	1 226
VZBFAMNB	F4,1630	= 117	3 117 890	V06N72FV	24,3135	514	1 513	V37QCAC	04,2366	234	1 232
VZSCAL	33,2012	41	1 879	V06N75	35,2417	634	2 626 631	V37RET	04,2116	229	1 859
V0	0006	= 933		V06N76	30,3021	850	1 832	V37XFC	04,2332	233	1 234
V00N25	6010	= 210		V06N79	15,2464	953	1 952	V37XFC	04,2361	233	
V00N34	4242	= 210		V06N79*	17,2626	260	1 261	V41K	14,3550	945	1 943
V01N14	32,2170	210		V06N81	35,3636	684	2 617 678	V43K	43,2765	283	1 282
V01N25	15,3477	1362	2 1362 1357	V06N84	13,2336	711	2 709	V47TXACT	43,2422	275	1 262
V01N46	20,2112	295	1 294	V06N87	14,3774	949	1 949	V5CNC	10,3501	1362	1 1357
V01N70	14,3772	949	1 948	V06N87*	07,2331	253	1 246	V50N00A	32,2171	210	
V01N71*	15,2463	953	1 952	V06N85*	14,2477	926	1 926	V50N16	32,2173	210	1 209
V01N71	07,2330	253	1 245	V06N90N	04,2774	702	1 702	V50N25X	43,2670	280	1 278
V04N06	10,3503	1362	1 1352	V06N93	14,3246	938	1 938	V50N4E	01,2337	= 297	1 297
V04N12X	43,2667	280	1 279	V06N95	21,2143	613	1 611	V50N6E	43,2357	= 272	1 272
V04N1272	23,2037	271	1 271	V06N99CS	31,2124	611	1 611	V50PASTE	10,3204	1357	1 1357
V05N00M1	10,3516	1362	1 1355	V06N9533	31,2051	611	1 611	V6N34	24,3674	657	1 655
V05N15	5006	1088	6 624 1372	V06647	01,2236	297	1 296	V6N95PRC	31,2032	611	1 611
V06N05	24,2665	509	1 507	V1	0014	= 933		V67	43,3234	295	1 262
V06N07	10,3500	1362		V1S	57,1600	= 148	14 148 882	V67CALL	31,2007	611	1 299
V06N11	35,2415	634	1 624	V1STC2S	10,3621	1387	4 366 1244	V67CLRF	31,2110	612	1 612
V06N12	35,2416	634	1 630	V16N20	14,3215	937	1 937	V67FLAC	0160	= 77	3 611 612
V06N16	32,2172	210	2 208	V16N40	26,3764	756	1 747	V67FLEIT	4744	= 77	
V06N16M	04,2773	702	1 711	V16N44	22,3317	714	2 714 717	V67SURF	31,2102	612	1 612
V06N18	26,2260	477	2 476 476	V16N45	35,3637	684	1 680	V67W	31,2120	612	1 611
V06N22	5010	1088	4 487 966	V16N54	27,3407	707	1 703	V67XXX	30,2042	613	1 613
V06N32	35,2032	618	1 617	V16N56	40,2076	301	1 300	V70UPCAT	43,3745	1378	1 262
V06N33*	24,2311	501	1 495	V16N62	14,2437	847	1 846	V71LPCAT	43,3747	1378	1 262
V06N33A	30,3022	850	1 831	V16N66	43,2665	280	1 275	V72LPCAT	43,3751	1378	1 262
V06N34*	15,2170	923	2 921 567	V16N67	43,2666	280	1 279	V73UPCAT	43,3753	1378	4 262 1378

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
V74	43,3062	=	289	WAKETEST	01,3045	1103	1 1103	WRENDPCS	E4,1400	114	2 11E 612
V82CALL	22,3242	713	1 284	WANG1	E5,1436	=	129 1 375	WRENDVEL	E4,1401	114	2 588 612
V82CON	43,2774	284	1 284	WANGC	F5,1434	=	129 1 375	WP1TFP	5744	1395	6 1394 1445
V82FMEIT	4752	=	78	WANGT	F5,1440	=	129 1 129	WR1TEU	5750	1395	1 1445
V82FMELG	0166	=	78	WANTAFS	36,2324	728	1 724	WP1TEV	5761	1395	1 1445
V82FLACS	E4,1527	=	116	729 WPANK	26,3331	589	1 588	WRTCESIR	15,3070	962	1 962
V82GCFE	22,3247	713	1 713	716 WCALC	22,2746	365		WSHAFT	E4,1402	114	2 588 612
V82GDFE1	22,3321	714	1 713	WCENTRAL	E6,1743	=	133 2 1463 1464	WSIZE	26,3437	59C	1 588
V82GDFLP	22,3267	713	1 714	WCHPHASE	1346	108	13 731 819	WSTCR	33,3434	881	3 881
V82GDN	22,3465	717	1 713	WCHPFOLD	F7,1621	=	150 7 150	WSUPFPCS	E4,1406	114	2 588 612
V82GDN1	22,3503	717	2 717	718 WCHVERT	E7,1647	=	151 3 794 809	WSURFVEL	E4,1407	114	2 588 612
V82GDN2	22,3536	717	1 717	WDAGAIN	41,3377	445	2 445	WTABORT	01,3364	1117	1 1115
V82GDN3	22,3541	718	1 718	WDCNT	0137	=	97 5 442	WTLST2	01,3375	1115	8 1116 1117
V82PERFE	43,2766	284	1 263	WDRET	0115	=	96 9 443	WTLST4	01,3261	1115	1 1119
V82PEFCSP	22,3475	717	1 717	WEART	26,2020	53	1 1128	WTLST5	01,3311	1116	1 1114
V82STALL	22,3300	713	1 714	WEIGHT/G	1243	=	105 6 758 767	WTLTCADR	01,3775	1296	3 1294 1297
V83CALL	37,3121	703	1 703	WHATALM	21,2375	792	1 801	WTFUN	E4,1413	114	2 588 612
V83PERF	43,2774	284	1 263	WHATDISP	31,2371	792	1 808	WVELSTCP	26,3213	588	1 588
V89CALL	26,2022	340	1 285	WHATEXIT	31,2367	792	1 805	WWB1AS	E4,1604	=	116 11 318 612
V89CALL1	26,2072	341	1 341	WHATGLD	31,2357	791	1 800	WWFCS	E4,1600	=	116 15 299 612
V89PERF	43,2766	285	1 263	WHATCUT	31,2317	785		WWVEL	E4,1602	=	116 9 318 613
V89RECL	26,2136	340	1 341	WHCHREAC	1356	108	5 315 585	=====			
V90PERF	43,3313	285	1 263	WHPEPCT	31,2172	786	1 786	X	0024	=	1193 22 1167 1182
V97NOC	10,2542	1363	1 1257	WHICH	E7,1455	140	30 242 857	XAC	01,2401	1080	1 1004
V99PECYC	36,3003	=	737 1 724	WHICHADR	32,3756	830	1 826	XAC2	01,2404	1080	2 1080
=====				WHIMPER	5634	1272	3 860 1274	XCHNYLCC	10,3224	1357	1 1353
W	E5,1400	122	34 122 1233	WHOCARES	E7,1471	=	141 4 488 1351	XCHQACC	10,2016	1354	1 1353
W.IND	1256	=	107 4 107 588	WHOLECON	42,3534	437	3 436 437	XCHSLREF	10,2765	1353	1 1354
W.IND1	1257	=	107	WIDECB	20,2152	1398	1 1397	XCHTOEND	10,3223	1357	3 1349 1353
WAITABIT	36,2567	722	5 722 725	WITCHENE	10,3206	1357	3 1349 1353	XCFX	01,2373	1080	1 1004
WAITADP	0063	=	95 3 1111 1115	WIXA	1315	106	5 1145 1147	XCCMPCN	12,3066	1182	1 1184
WAITBANK	0062	=	95 1 1114	WIXB	1316	106	3 1145 1147	XCC	F5,1664	=	124 12 124 1246
WAITBB	5221	1111	2 1111 1121	WLINIT	26,3251	588	3 580 589	XDELVEIT	4744	=	69
WAITEXIT	0061	=	95 7 1111 1367	WLCCP	12,3013	1181	1 1181	XDELVFLC	0045	=	69 6 617 764
WAITLIST	5203	1111	46 165 1314	WLSRFFCS	26,3274	588	1 588	XD1FF	12,2163	1168	
WAITMASK	10,2761	1353	1 1353	WLSRFVEL	26,3211	588	1 588	XDSFBIT	4753	=	73 1 1344
WAITPCCH	01,3524	1124	1 1114	WM	E4,1724	=	121 6 121 876	XDSPFLAG	0112	=	73 1 208
WAITTEMP	0064	=	95 3 1119	WMATEND	11,3700	1234	1 1232	XI	0030	=	1193 7 1168 1187
WAIT2	01,2232	1114	2 1111	WMATRXNG	43,2110	291	1 263	XKEP	E3,1552	=	111 3 126 1231
WAIT68	42,2226	272	1 272	WCRKTIME	16,2624	1417	1 1417	XKEPCSM	F3,1624	112	
WAKECAC	00,3774	1368	1 1367	WZSRC	05,3577	965	2 984 989	XKEPLEM	F3,1676	112	
WAKECADR	10,3511	1362	3 1353 1354	WPLAT1	E5,1560	=	129	XKEPNEM	E4,1527	=	115 3 115 1219
WAKEPLAY	10,3025	1354	1 1359	WPLATO	E5,1464	=	129	XXAX	0012	=	1193 9 1167 1170
WAKEP	00,3766	1367	1 1368	WPOSTORE	26,3276	588	1 588	XXIN	0014	=	1193 6 1167 1170
WAKESTAI	13,3463	1211	2 1210 1211	WRDPET	0115	=	96	XXMKRPT	07,2416	255	1 255

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES										
XNB	E5,1664	=	124	12	374	1387	YNBSAV	F4,1636	=	117	4	117	973	ZI	E5,1642	=	127	25	127	1150	
XNBADR	37,2476	=	382	1	374		YOK	32,2634	=	827	1	827		ZIX4	1317	=	106	4	1145	1147	
XNBFCADR	16,2035	=	1255	1	1255		YRATF	F4,1752	=	121	5	121	842	ZIX8	1320	=	107	4	1145	1147	
XNBPTD	E4,1545	=	115	11	115	566	YRFG	1003	=	101	3	428	436	ZKP	E5,1700	=	124	6	375	1243	
XNBPIFAD	33,2414	=	858	1	856		YRGCLP	1006	=	101	2	101	436	ZNBPIF	F4,1561	=	115	1	906		
XORFLPTT	4743	=	84	1	849		YSCIT	E5,1714	=	125	1	125		ZNBSAV	F4,1644	=	117	3	971	973	
XORFLG	0253	=	84	1	849		YSCREF	F7,1614	=	148	1	762		ZCNF1	17,3615	=	1456	2	1453	1456	
XOVINFIC	0211	=	97	7	225	865	YSM	E5,1650	=	124	4	124	1243	ZCNF2	17,3606	=	1456				
XOVINHIB	4743	=	87	2	9	3	1420	YSMD	F7,1614	=	148	6	148	975	ZONE2,2	17,3602	=	1456	1	1453	
XPRFV	E3,1552	=	126	2	1168	1171	YSZERO	F7,2177	=	251	1	251		ZCN3	17,3610	=	1456	1	1456		
XRANGF	F7,1642	=	153	5	153	832	YUNIT	12,2002	=	1093	2	37	560	ZCNF3LIM	E6,1556	=	135	1	1456		
XREF	1002	=	111	5	306	421	YV	1125	=	104	11	104	1234	ZCNF3MAX	20,3766	=	1496	1	1487		
XREFCLF	1005	=	131	2	402	421	YZCHK	07,2171	=	251	1	250		ZCNF4	17,3427	=	1453				
XROT	26,2372	=	485	1	485									ZONE4,5	17,3416	=	1452				
XSCIT	E5,1706	=	125	1	125		Z	0005	=	92	24	305	1372	ZCNF5	17,3461	=	1453	1	1453		
XSCREF	F7,1606	=	148	3	762		ZACCDOT	20,2755	=	1480	1	1480		ZCN1,2,3	17,3575	=	1455	1	1452		
XSM	E5,1642	=	124	24	124	1243	ZAPITJ	21,2670	=	1499	1	1499		ZOOM	35,3667	=	733	4	240	735	
XSMADR	27,2477	=	382				ZATTERC	20,2154	=	1358	13	286	1438	ZCCMBIT	4744	=	74	1	762		
XSMO	E7,1606	=	148	15	148	975	ZAXIS1	F7,1725	=	120	6	833	845	ZCCMFLAG	0122	=	74	2	729	733	
XSQF(XI)	0024	=	1193	5	1170	1176	ZDATA2	21,2261	=	892	1	900		ZCCMTIME	E7,1422	=	135	5	240	805	
XSTORE	01,2347	=	1079	3	1079		ZCC	E5,1707	=	124	5	124	1246	ZFRIME	0026	=	125	7	1239	1240	
XSU	01,2412	=	1080	1	1084		ZCCT	E4,1712	=	120	3	120	838	ZREG	1004	=	101	3	408	437	
XTRANS	17,3112	=	1445	3	1435	1443	ZCOTO	F4,1676	=	120	6	120	848	ZPEGLF	1007	=	101	2	101	437	
XUNIT	12,2004	=	1093	9	37	1225	ZCOTCCMP	34,3524	=	848	1	838		ZRLPT	0015	=	92	2	1418	1449	
XXXAIT	F7,1670	=	143	4	143	695	ZERDUMMY	F7,1646	=	150	2	150	151	ZSCI	E5,1714	=	125				
XYMAPK	F7,1551	=	146	18	146	950	ZERLINA	F7,1443	=	141	4	141	815	ZSCREF	F7,1622	=	149	1	762		
X1	0046	=	93	69	252	1391	ZFRF	4755	=	1087	319	158	1500	ZSM	E5,1656	=	124	2	124	1243	
X1INPLT	F7,1611	=	143				ZFRG/SP	23,2523	=	596	1	570		ZSMC	F7,1622	=	148	5	145	575	
X2	0147	=	93	29	489	1262	ZERQANS	00,3376	=	1071	2	1071		ZSFCE	15,2413	=	952	1	951		
X789	E3,1700	=	112	5	157	1149	ZFRFCATA	21,3041	=	970	1	893		ZUNIT	12,2000	=	1093	4	37	1228	
Y	E4,1734	=	120	6	121	849	ZERCDF	12,2006	=	1093				ZV	1133	=	104	8	1229	1234	
YAW	F4,1762	=	121	3	121	833	ZERGEBEL	16,3204	=	1424	2	1424		ZITEM	0131	=	1495	4	1491	1492	
YAWANG	F4,1602	=	119	2	489	493	ZERFHIGH	21,3445	=	1471	1	1471		Z123	23,2545	=	1141	1	1142		
YAWOUN	20,2230	=	833	1	833		ZERFICDL	5457	=	1299	4	166	1301	Z123CCNF	17,3561	=	1455	3	1453	1455	
YCD	F7,1632	=	153	6	153	841	ZEPICINC	37,2367	=	380	2	374	384	Z3TEM	0152	=	1495	1	1487		
YCCMP	27,3312	=	849	3	827	838	ZERICING1	37,2371	=	380	1	380		Z5TEM	0132	=	1495	4	1490	1491	
YCONS	F4,1746	=	121	3	121	842	ZEPOLCLP	21,3607	=	1473	2	1473									
YCC	E5,1672	=	124	5	124	1244	ZERQLSTY	21,3015	=	899	7	808	895	0.25356	20,3104	=	1484	2	1478	1479	
YDCT	F4,1710	=	120	5	120	841	ZERQNCX	E5,1571	=	129	11	374	384	DEBANK	43,3362	=	1278				
YDOTO	F4,1674	=	120	3	120	838	ZFPCO	23,2523	=	1145				00314CCT	5764	=	1395	4	1355	1434	
YLIM	E5,1564	=	123	2	123	827	ZFRCTT	21,3442	=	1471	2	1471		06SEC	23,2321	=	522	1	521		
YMKOUP	07,2422	=	255	1	254		ZEROPUS	25,3020	=	1482	1	1482		07400CCT	16,3617	=	1431	1	1419		
YNP	E5,1672	=	124	6	375	1243	ZERCTJ	17,2620	=	1429											
YNBPTF	F4,1553	=	115	3	115	758	ZERCVFC	12,2006	=	1093	13	37	1237	1.2SPCT	01,2016	=	239	4	235	243	
							ZERDVCS	23,2523	=	1052	19	27	1145	1.3SPCT	01,2024	=	239	1	239		

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SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
1.5SFCS	26,3714	596	1 592	1DEC70	21,2103	824	1 824	16CCT	30,3564	913	1 913
1.5SPOT	01,2127	239		1DEC71	21,2104	824	1 823	17TQ20	43,3664	1282	
1.95SFCS	33,3112	876		1DEGDR	05,3467	826	1 825	17OMS	4361	=	885 1 885
1-CSTH	05,1733	=	126 4 126 1186	1DPR2	34,2067	635	2 636 638	18CDEGS	31,3732	821	1 800
1-3JKFT	33,3114	876	1 869	1DPR28	34,2071	635	2 636 641	18OMESS	27,3123	772	1 771
1.703	4733	=	1496 3 1488 1490	1JACC	06,1530	124	11 124 1487	18CSFLP	36,3637	754	1 754
1/ACCFIX	06,3244	193	1 192	1JACCCN	20,3216	1486	1 1485	=====	=====	=====	=====
1/ACCFJB	21,3644	1476	2 192 1397	1JACCC	06,1531	=	134 6 1461 1485	2.0SPT	04,2126	229	
1/ACCFJ	20,3235	1487	2 1479 1491	1JACCP	06,1532	=	134 6 1461 1485	2.11SPCT	01,2043	240	
1/ACCFRT	20,3675	1493	2 1481 1493	1JACCL	06,1533	=	134 12 1479 1491	2.11SPT	04,2127	229	
1/ACCS	20,2463	1476	2 858 1476	1JACCV	06,1534	=	134 1 1479	2.13SPT	01,2046	240	
1/ACCSFT	21,3637	1476	1 1401	1CVSGRT2	42,3766	491	2 489	2.15SPCT	01,2051	240	
1/ACCAST	06,1573	=	135 1 1453	1REV	12,2073	1166	1 1166	2.17SPT	01,2054	240	
1/ACSTP	06,1553	=	1495 2 1488	1SEC	4777	1088	18 270 545	2.2SPCT	01,2016	=	239 1 239
1/ACOSTT	0127	=	1495 5 1489 1494	1SEC+1	43,2672	280	2 277 279	2.21SPCT	01,2057	240	
1/ANFT	0160	=	1496 7 1490 1494	1SEFCX	4777	=	382	2.3SPCT	01,2032	239	1 239
1/ANFT-	20,3716	1494	1 1491	1SEFCXT	05,1572	=	129 2 384 385	2.5SPCT	01,2035	240	
1/ANFTP	06,1551	=	1495 5 1425 1488	1SEC2C	27,2675	768	1 767	2.7SPCT	01,2040	240	
1/ANFT1	06,1567	=	135 12 135 1493	1STAR	15,3022	562	2 562 574	2.7SPT	04,2130	229	1 229
1/ANFT2	06,1570	=	135 6 1429 1485	1STGRAC	10,3164	1256	1 1256	2/3	05,3771	=	1237 1 1225
1/ATEM1	0123	=	1495 22 1491 1495	1STOWCS	16,2256	1412	3 1411 1412	2ELANK	40,2601	406	6 403 460
1/ATEM2	0124	=	1495 4 1491 1491	1STQ2S	10,3615	1387	3 374 552	2NZER	12,2006	=	1129
1/DV0	07,1570	=	850 2 836	1TC28TCQ	30,3637	915	2 915	2FBANK	42,3276	1278	1 1279
1/DV1	07,1624	=	153 5 153 836	1TQ2SUB	10,3645	1386	6 1387 1388	2INTCLT	40,2766	422	1 418
1/DV2	07,1636	=	153 5 153 836	1T,11	21,2037	823	1 823	2J	33,2043	45	1 873
1/DV3	07,1640	=	153 5 153 836	1CSFCS	32,3746	830	1 844	2J3RE/J2	13,2016	46	2 1226
1/EYRC	06,3515	334	3 329 336	1TACS	22,3105	=	850 2 842	2K	4741	=	1091 3 998 1103
1/MU	0016	=	1192 4 1176 1185	1DMRLPT	7732	=	156	2K+3	4444	466	1 466
1/NFTMIN	20,3724	1494	2 1491 1494	1DPCITC	36,2014	38	1 327	2NCRETA	22,3117	367	2 367
1/PIPA	06,3271	327	3 386 959	1DSPIN	40,3440	447	4 404 444	2PHSCHNG	5327	1288	10 494 858
1/PIPADT	0074	102	10 166 558	12DC	23,3250	1149	1 1147	2PI+3	27,3215	773	2 771
1/PIPA1	06,3340	327	1 327	12DMRLPT	06,2041	158	1 161	2PI/8	26,3440	590	2 584 586
1/RCCTMU	0022	=	1193 5 1166 1176	12MS	5741	=	182	2PISC	04,3036	1177	2 1167 1184
1/RTML	27,2030	46		12-11,1	41,3740	471	1 470	2RNDENC	40,3227	436	
1/RTMLC	22,2002	44	2 714 717	12,14,15	7742	1090	5 282 1409	2RCLNC	40,3217	436	3 433 435
1/RTMLN	22,2000	44	1 717	13,7,2	4615	527	2 186 526	2SEC(17)	30,3007	850	1 850
1/WLODP	12,3151	1183	1 1183	130DEG	35,3654	684	1 661	2SEC(18)	33,3105	876	2 828 850
1/10	01,2342	297	1 295	14,11,9	06,2171	161	1 158	2SEC(28)	33,3117	876	1 880
1/10S	4752	=	1436 14MS	17,3136	=	1436 6 1435		2SEC(9)	30,3016	850	1 826
1/10SFC	4753	=	1423 1406ALM	21,3714	820	2 792		2SECDELY	00,3735	1367	3 272 509
1/2DEG	31,3733	821	1 800	1406PCC	21,3712	820	1 792	2SECS	5000	1088	7 566 1367
1/40	16,3624	1431	4 1413 1415	15/16	12,3771	1237	1 1225	2STAPS	15,3020	962	1 974
1/6TH	14,3772	949	1 949	15ADRERS	01,2430	1081	7 1079 1083	2VEXHST	07,1742	=	765
1BITDP	26,2413	486		15BITADR	6255	1001	1 1007	2VISTC2S	10,3636	1388	2 324
1RI	12,2004	=	1140 1 1123	1500CDE	24,2667	509	2 501 509	20.50DEGS	25,2613	546	1 546

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SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
27J	32,2041	45	1 873	=====	504AZ	0922	= 1140 3 1138				
20MPLEF	7734	= 160	3 153 161	4.11SPCT 01,2107	241		504F	0006	= 1140	5 1136 1137	
20SFC	32,2176	210	1 2 9	4.13SPCT 01,2112	241		504LM	F4,1412	114	3 1132 1228	
20MS	16,3622	1431	2 1417	4.15SPCT 01,2115	241		504LPL	0016	= 1140	4 1139	
2010C4	42,2671	280	1 278	4.17SPCT 01,2120	241		504RM	04,2002	45	1 1131	
21/22RFG	0115	= 96	3 399 472	4.2SPCT 01,2070	240	1 239	504RFP	0000	= 1140	4 1132 1134	
25/32	7721	= 1431	1 1426	4.21SPCT 01,2123	241		526ALARM	24,2102	498	1 569	
25KFT	33,2214	850	1 844	4.23SPCT 01,2126	241		54CD	23,3246	1149	1 1145	
250DFC	24,2304	501	2 5 7	4.25SPCT 01,2131	241		59.99SEC	42,3542	437	1 427	
250MS+1	4766	= 280	1 290	4.27SPCT 01,2134	242		59M1N	42,3541	437	1 426	
26SFC	36,3763	756		4.3SPCT 01,2076	241	1 239	=====				
271030	43,3672	1282		4.31SPCT 01,2137	242		6.2SPCT 01,2016	= 243	1 239		
=====				4.33SPCT 01,2142	242		6.3SPCT 01,2200	243	1 239		
3.2SPCT 01,2016	= 240	1 239		4.35SPCT 01,2145	242		6.5SPCT 01,2203	243			
3.3SPCT 1,2062	240	1 239		4.37SPCT 01,2150	242		6.7SPCT 01,2206	243			
3.5SFC 27,2677	768	1 767		4.6SPCT 01,2101	241		6CC	22,3247	1149	1 1147	
3.5SPCT 01,2165	240			4.7SPCT 01,2104	241		6FA1LTAP	06,3260	= 193	2 192 193	
3/32	12,3767	1237	1 1225	4.9SEC 36,2151	741	1 727	6KFT/SEC	33,3116	576	1 882	
3/4	05,3761	1237	5 951 1226	4SFC (17) 30,3005	850	2 766 839	6SEC	27,2703	768	2 768	
3/4FP	22,3655	822	2 8 1 803	4SFC (28) 23,3111	576	1 811	6SEC (18) 30,3013	850	1 826		
3/5	12,3765	1237	1 1225	4SFC 5003	1088	2 166 78E	6SECONDS	26,3713	556	1 552	
3/64	12,3763	1237	1 1225	4CCYC 4771	= 1423	1 1425	6SECS	25,3530	566	1 565	
3/8DP	22,3653	822	1 801	4CCYCL 4771	= 1426	1 1427	6CDEC	05,3063	219	1 213	
3AX1SBIT	4746	= 74	2 475 476	40FPS 05,3470	845	1 845	60M1N	35,2426	634	6 626 631	
3AX1SFLG	0124	= 74	7 270 948	42DEG 15,2762	555	1 556	60MS	4776	= 1436	2 1435	
3CSTCS	13,3667	1216	1 1215	49FPS 34,3364	835	1 833	60SCNDS	24,2444	505	1 505	
3J22F2MU	17,2724	46		=====			60MS	07,3741	1321	1 1204	
3SECONDS	26,3711	596	1 520	5.2SPCT 01,2153	242	1 239	60SEC	24,3671	657	1 657	
3SECS	5002	1088	1 786	5.3SPCT 01,2167	242	1 239	60SFCS	12,2631	1201	2 239 1201	
30DEC	24,3354	577	1 576	5.4SPCT 01,2161	242		63/64+1	7731	1090		
30DFGCHK	24,3336	576		5.6DECS 4562	525	2 525 546	=====				
30KCHK	33,2472	869		5.5SPCT 01,2172	242		7.5	32,3103	576	1 580	
30RMSK	16,2761	132	1 142	5.7SPCT 01,2175	243		7/12	05,3763	1237	1 1225	
33DFC	4254	458	1 458	5/128 05,3767	1237	1 1226	70DEC	32,3567	826		
33RMSK	5026	= 182	2 168	5/8 13,3734	1238	6 1203 1227	77CECML	37,3075	390	1 384	
34DFC	4242	457	2 210 457	5BLANK 40,2536	405	6 405 459	77C01CCT	05,3062	219	1 213	
35DEG	15,2763	559	1 556	5BLANK1 40,2557	406		79DISP	15,2437	952	2 952	
360-CCU	40,2625	419	2 419 434	5BIC 01,2477	1083		=====				
360-CCUF	40,2634	419	1 419	5DEGREES 14,2601	929	2 929 563	8192ALG	07,3551	1314	1 1314	
360-CCLO	40,2623	419	1 418	5DFGTEST 15,3130	563	2 963	82DECS	4563	525	1 525	
360CHECK	12,3122	1183	2 1181	5FAILTAB 06,3250	= 193	2 192 193	89SECS	27,2705	768	1 768	
36QLAMB	12,3473	1188	1 1185	5KALARM 07,2454	256	2 255 261	89TEST	40,2161	400	2 399	
36QSW	0206	= 80	3 1181 1183	5SFC 36,3762	756	2 727 729	=====				
36QSWBIT	4753	= 80		5SFCDP 36,3761	756	1 726	9/16	05,3765	1237	1 1225	
39S0DEC	37,2471	382	1 377	5SFCS 27,2701	768	2 767	9,6,4	05,3362	224	1 217	

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SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
90MSCALR 17,2053		564	1 563	90SECS	06,3005	182	2 165	99999CCN 32,3256		782	1 779

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BC BADLY DEFINED	CD DEFINITION ASSOCIATED WITH CONFLICT	XX MISCELLANEOUS TROUBLE	

UNREFERENCED SYMBOL LISTING, INCLUDING DEFINITION, HEALTH, & PAGE OF DEFINITION.

SYMBOL	DEF	H PAGE	SYMBOL	DEF	H PAGE	SYMBOL	DEF	H PAGE	SYMBOL	DEF	H PAGE
+AZ	11,2364	815	AUTOMODE	3321	= 86	CDUREAD	E5,1441	= 128	BEGINSF2	40,3055	433
+FL	11,2376	815	AUTRATE1	4753	= 88	CDURFAD1	E5,1442	= 128	DEG60	15,2471	953
=====			AUTRATE2	4752	= 88	CDLSCMD	0054	= 52	DELRSFL	22,3541	= 37
-AZ	11,2357	815	AUTRIFLG	3321	= 83	CDUTIMEF	E5,1436	= 128	DELTEE	E7,1611	= 142
-FL	11,2371	815	AUTR2FLG	0320	= 88	CDUTIMEI	E5,1434	= 128	DELVMID	E7,1575	= 142
-LCKGNFG	23,2740	271	AUXFLAG	1147	= 76	CHAN	E5,1443	= 128	DELVTEST	27,2252	758
-MUOT1	23,2023	44	AVEMOBI	4753	= 81	CHKBIT10	17,2237	1434	DERCCF+1	C153	= 98
=====			AVRAGFG	33,2267	856	CHKLIST	05,3524	984	DERCCF-1	0151	= 98
?	6001	= 741	AVFLBIT	4747	= 69	CHKSA8	14,2252	939	DERCCF-2	C150	= 98
=====			=====			CKINUSE	5244	1113	DERCCF-3	C147	= 98
ABORT	5634	= 1374	BACROOT	31,2635	819	CKMDMCF	43,2761	= 1378	DERCCF-4	0146	= 98
ABVAL	00,3201	1067	BOTCK	27,2461	764	CL1/NET+	20,2466	1450	DERCCF-5	C145	= 98
ACCCFLG	0217	= 88	BPTZ	01,2453	1082	CAGL	22,2400	358	DERCCF-6	0144	= 98
ACMDRBIT	4737	= 68	PIASTEMP	E6,1711	= 136	CNTCHK	07,2235	252	DERCCF-7	0143	= 98
ACCSABPT	10,2723	1078	PIGACS	20,3345	1488	CNTFCHK	43,3507	1279	DERCCF-8	C142	= 98
ADDRCSS	6116	996	BIT14+7	26,2256	477	CMARFINE	14,3352	940	DEX2	C144	= 98
ADRS+1	43,3646	1282	BIT4+	30,2115	850	COFMAXGO	22,2176	354	DEPNT	40,3420	447
AFCCLC2	31,3174	803	BIT8,5	17,3140	1446	CCGAFET	4750	= 80	CGOOD?	32,2742	607
AFOUPE	31,2151	786	BLANKCHK	10,3133	1356	CCMPMAT	13,2231	710	CIDFLAG	0020	= 67
AGSBUFFE	E4,1615	= 118	BLANKRFT	0114	= 96	CCNTDES2	26,2576	593	CIMBIT	4753	= 71
AGSDISP	32,2322	208	BNKCHK	43,2737	1283	CCNV3	42,3623	489	CIMENBIT	4743	= 74
AGSLIST	15,2417	= 194	BNKCPTN	43,3336	1277	CCPYCYC2	33,2632	872	CINLRALT	1336	= 107
AGSUPDAT	0001	= 236	BPSPT1	31,2555	795	CCPFUND	01,2637	1099	CINLSTADR	0233	= 99
ALCGK	37,2627	386	BPSPT2	31,2662	757	COLNTPL	E5,1542	= 128	CCALAPM	E155	= 1374
ALGCPTEM	21,3134	1463	BPSPT3	31,2037	800	CSMCKFLG	C305	= 87	CCALIGN	15,3104	563
ALINEX	26,2067	340	BPSPT4	31,2223	803	CS359+	35,2422	634	CCCNADR	05,3516	984
ALKCG	37,2632	386	BUSYMASK	10,2536	1362	CLLTBIT	4745	= 71	CCDACHAN	05,3564	984
ALMNCADR	5724	1374	BUTTONS	05,2701	216	CYCLESFT	43,3516	1280	CCRSAMP2	25,2027	492
ALPHATRY	21,3336	1469	BI2-1	4356	= 463	C1MF	E6,1723	= 136	CCSIFT	21,3530	1472
ALRM527	24,3101	512	PSTPR	11,2466	1082	C1PP	E6,1721	= 136	CCITXBR	01,2425	1080
ALTROUT	21,2160	891	=====			C2MF	E6,1717	= 136	CCPAGREE	7260	1028
ALTSAL	0272	= 96	CAMPARK	1373	= 100	C2PP	E6,1715	= 136	CCSBURN	E6,1750	= 132
AMGFRY	E4,1400	= 114	CALCDIP	E5,1460	= 128	C2SQM	E6,1713	= 136	CCO	CC36	= 933
ANTENFLG	0267	= 85	CALCTHFT	27,2255	758	C2SCP	E6,1711	= 136	CCPI	CC40	= 933
ADRSFLG	0125	= 74	CALC2BIT	4752	= 70	=====			CCSKYFLAG	0113	= 73
ANSV	E6,1544	= 134	CALC3BIT	4751	= 70	CAFNATA3	01,2303	296	CCSCECNR	40,3316	444
APSESBIT	4747	= 79	CALSAM	15,2536	955	CAPLUPRT	E6,1754	= 138	CCSPLV	41,2421	445
ARCCMF	21,2167	891	CFLF/2	0116	= 1258	CBSELFLG	C316	= 88	CCSF06B	43,2337	272
ASCSPOT	23,2505	862	CFLVE	26,2012	157	CESL2FLG	C315	= 88	CCDCCAY	36,2004	3E
ASECXT	E5,1573	= 129	CCUANG	E5,1542	= 128	CCDL	E6,1635	= 137	CCMFCNIC	27,3426	1262
ASENTE	30,2000	= 34	CLUCANG	E5,1440	= 128	DEC-12	12,2016	1093	CCMPRPR	27,3464	1264
ASENT7	23,2000	= 32	CDLFLAG	E5,1461	= 128	DEC-6	12,2015	1093	CCMFTFF1	27,3547	1268
ASTACLK	32,3205	781	CCUINC	10,3661	138E	DEC27	4764	= 1088	CCMFTFF2	27,3644	1269
ATOPTRIS	13,2735	= 37	CCULIMIT	E5,1443	= 128	DEC29	4765	= 1088	CCMNTSET	33,2323	856
AUTCMANV	26,2172	476	CDLMDX	E5,1536	= 128	DEC51	04,3235	1322	CCMCA	33,2314	856

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UNREFERENCED SYMBOL LISTING, INCLUDING DEFINITION, HEALTH, & PAGE OF DEFINITION.

SYMBOL	DEF	H PAGE	SYMBOL	DEF	H PAGE	SYMBOL	DEF	H PAGE	SYMBOL	DEF	H PAGE
DVMONCON 36,2554	=	732	ENGONFLG 0123	=	74	GEOSTRT4 37,3025	=	389	IMUGCCD 07,3630	=	1317
DXCRIT+1 0125	=	98	ENTERDAT 07,2073	=	246	GETAQSUW 20,2246	=	1487	IMUZERO3 07,2760	=	1301
D21 E6,1705	=	136	ENTERGR 17,2445	=	1437	GETPCCT 21,3274	=	1465	INFINBIT 4745	=	79
D6CR9EIT 4752	=	71	ENTPASHI 41,2012	=	407	GFT22/32 21,2543	=	896	INTFLAG 0227	=	82
=====			EPACFEIT 4737	=	67	GLCKFRIT 4736	=	70	INTGTHIS 13,2300	=	710
E/BKCALL 04,2560	=	371	EPMINUS 47,2713	=	472	GMPLRITB 21,3626	=	1474	INTVEC E5,1462	=	129
E/CALL 04,2577	=	372	ERRTEST 17,3361	=	1452	GN/CCODE 5001	=	1088	INTYFBIT 4750	=	71
E/JDRWAK 04,2613	=	373	ETPIBIT 4745	=	69	GCAGIN 10,3051	=	1362	INTZ E5,1474	=	129
E/SWITCH 04,2575	=	371	EXOVFLOW 31,2420	=	807	GCCLCSF 21,3616	=	1474	IRICCCMF 06,2336	=	329
EARTCNTR 14,2514	=	928	EXVPT 31,2415	=	807	GCOSPR1 10,2452	=	1347	ISSUP 06,2321	=	166
EIGHT 4750	=	1091	FI E7,1676	=	146	GCOSP2 10,2445	=	1347	ISSWOFF 06,2716	=	180
END-F3 03,1777	=	113	FI2 E4,1636	=	117	GCOCMAFK 10,2406	=	1346	ISWCALL 4700	=	992
END-F4 E5,1400	=	120	FI E7,1700	=	146	GCMAPK2 10,2337	=	1345	ITRPNT1 32,2363	=	811
END-F5 E5,1774	=	129	FI2 E7,1704	=	146	GCMAPK2P 10,2356	=	1345	ITRPNT2 32,2317	=	813
END-F6 E6,1771	=	138	=====			GDMARS 10,2331	=	1345	ITRC 6373	=	1006
END-F7 E7,1777	=	153	FALTCF 4370	=	463	GCFERFRS 10,2706	=	1352	ITR1 6362	=	1006
END-F7.0 E7,1745	=	153	FAZAL 23,2777	=	1146	GOPERFS 10,2626	=	1350	ITP10 6145	=	997
END-F7.1 E7,1747	=	153	FAZBI 23,3075	=	1147	GOPERFIR 10,2704	=	1352	ITR11 6205	=	998
END-F7.2 4000	=	153	EDAIY E4,1745	=	119	GOPERF2 10,2631	=	1350	ITR12 6137	=	997
END-F7.3 E7,1630	=	153	EDAIZ E4,1746	=	119	GCSEPV 33,2274	=	856	ITR14 6242	=	1000
END-F7.4 E7,1777	=	153	FFTAG11 4000	=	28	GCXCF 10,2330	=	1362	ITR15 6126	=	997
END-F7.5 E7,1655	=	153	FFTAG12 4000	=	28	GCXSPF 10,2350	=	1362	ITR7 6264	=	1001
END-IM/M E7,1672	=	143	FFTAG13 4000	=	28	GRP4OFF 32,2677	=	828	ITSWBIT 4735	=	77
END-UE 1377	=	108	FIGHTIME 35,2756	=	668	CTSGO+CN 21,3104	=	1462	=====		
ENCRALL 26,2352	=	480	FINALBIT 4746	=	69	GLESS 27,2020	=	374	JAMFRCC 4243	=	457
ENDCFKG 37,2366	=	380	FINAK2 43,2402	=	274	GUESSBIT 4752	=	68	JETSCN 17,3436	=	1453
ENDCDPT4 5270	=	190	FINAP 16,3041	=	1421	GLESS1 37,2255	=	378	JSWCHBIT 4736	=	65
ENDHMSS 42,3606	=	438	FIRER 17,2257	=	1434	GUILDEN 31,2421	=	793	=====		
ENDLLJCB 31,3442	=	807	FIRSTIME 27,3171	=	772	GYTCRETQ E5,1462	=	128	KACS 16,2623	=	1417
ENDLRF 34,3617	=	886	FLXCLPAS 47,2402	=	402	G21 E6,1707	=	136	KEYCCM 04,3265	=	1328
ENDMANLV 26,2200	=	476	FLAGOREY 32,3020	=	778	=====			KLFENEX 10,2333	=	1345
ENCMARKS 07,2317	=	253	FLARBIT 4744	=	81	HIGATCHK 33,2522	=	869	K1 E6,1703	=	136
ENCNBSY 04,2637	=	466	FLASHF 21,2022	=	823	HITFST 33,2516	=	869	K2 E6,1711	=	136
ENDRASTE 4143	=	441	FLCPBIT 4740	=	80	HLIGHT 25,2600	=	615	K3 E6,1717	=	136
ENDPINBF 4512	=	467	FLRIBIT 4741	=	80	=====			K3S1 22,2370	=	358
ENDPINS1 40,3737	=	473	FLVREIT 4746	=	80	ICCRK2 43,2215	=	268	K4 22,2372	=	358
ENDRINS2 41,3743	=	471	FPETRET 0144	=	97	ICADPTM 0142	=	97	K4SQ 22,2374	=	358
ENDRMCFE 4616	=	527	ESPASBIT 4742	=	66	ICAC3TEM 0152	=	98	=====		
ENDROLL 22,3226	=	370	FUTLNFE 57,1666	=	151	ICLCRET1 10,2302	=	1358	LASTLADW E7,1745	=	152
ENDRODAT 41,2320	=	412	FUNCT3 21,2243	=	1465	IC E6,1725	=	126	LASTTIME C1,2502	=	1124
ENDSPCT 47,3451	=	447	=====			IGNALG 32,3032	=	778	LATA2CHK 37,2021	=	374
ENDSTFEP 36,3652	=	754	GLMPL 31,3432	=	807	IGNALCRT 32,3203	=	781	LATEFWDV 21,2553	=	896
ENDS40.9 27,2725	=	769	GENMARK 10,3022	=	1354	IMFDRFT 10,3370	=	1360	LECMN 0056	=	93
ENDVPLSH 6543	=	1012	GETLUTT 37,2004	=	374	IMUBACK 27,2005	=	374	LCSI E5,1444	=	128
END2IFC 40,3341	=	444	GEORSPK 37,3111	=	390	IMUFIN20 07,3202	=	1321	LCS2 E5,1452	=	128

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SYMBOL	DEF	H	PAGE	SYMBOL	DEF	H	PAGE	SYMBOL	DEF	H	PAGE	SYMBOL	DEF	H	PAGE
LNTFMIN	0124	=	96	=====				CCT40200	7740		1090	PCS1TF	15,2726		978
LCUNITX	12,2004	=	37	NBC3	06,3614		335	CCT40420	10,3527		1363	PCSTCRKV	56,1517	=	134
LCUNITY	12,2002	=	37	NBCSFL	37,2012		374	CCT67777	10,3536		1363	PCSLPDA1	23,3127		877
LCUNITZ	12,2000	=	37	NPINB2	22,2515	=	37	CCT7777	05,3955		219	PCS1/4	12,2765	=	1237
LPSC2BIT	4746	=	84	NCOMPTST	41,2440		416	OGF	E6,1717	=	136	PCWFLIT1	23,2000		32
LRALFLG	0276	=	86	NEDLFL11	20,2350		1418	CLDESFLO	0016	=	66	PREBJUMP	5316		1264
LRPFSALM	33,2543		870	NEGTOBKU	E6,1516	=	134	CMFEGCALC	26,3610		594	PRFCIBIT	4744	=	71
LRPOSFLG	0275	=	86	NEGTOBKV	E6,1520	=	134	OPTAXIS	07,2142		248	PRICDFLG	0075	=	72
LR24,011	26,3471		592	NEGTOBKP	E6,1514	=	133	CFTICN3	1145		104	PRIC1	4742	=	1791
LRUPT	0711	=	92	NFG11	5172		1108	CPTNREG	E5,1463	=	128	PRIC11	5022		1089
LRVFLBIT	4744	=	86	NFCS	41,2115		409	CRWFEBIT	4746	=	71	PRIC2	4741	=	1091
LRVFLFLG	0273	=	86	NETZERO	6124		997	CRDERBIT	4746	=	79	PRCCREDE	06,2075		156
LSTPR	0144	=	97	NFWBIT	4737	=	75	ORIG	E4,1515	=	116	PRCCKEY1	40,2514		451
LUNABIT	4740	=	70	NJBTBIT	4735	=	67	CRIC1A	E5,1772	=	127	PRCCUCT	21,3516		1472
=====				NK,VJSTS	E6,1522	=	134	QTHSHIP	22,3323		714	PRCJ	0022	=	151
MANUPBIT	4736	=	77	NKBIT5	E5,1442	=	128	QURRCFLG	0206	=	87	PRONVB1T	4745	=	73
MANUFLAG	0152	=	77	NKONLST	E5,2172	=	194	CLTGCAVE	22,3707	=	859	PSK1PADR	16,3627		1431
MANLSTAL	22,3167		367	NKRESE1	07,2422		1311	CLTLINK	0057	=	53	FTFLGAT	0251	=	83
MARKFORM	10,2340		1345	NKFFINAL	13,3301		1209	=====				PULSEM	14,2222		938
MASKREC	E5,1534	=	128	NKMSBIT	4742	=	77	F-RATE	16,2510		1415	PUTXY	41,2720		428
MASSMCN	33,2223		855	NKMSCL	16,3620		1431	PARAM30	35,2021		617	FLTYXZ	41,2636		427
MDOTAPS	36,2310		38	NKMTFST	40,3512		1073	PCA	0026	=	125	P12A	23,2000	=	32
METHC02	22,2216		355	NKMLBIT	4737	=	72	PERFCHEK	10,3136		1356	P12LMB	30,2122		831
MGLVFBIT	4752	=	75	NKMLFLG	0076	=	72	PH1	0024	=	522	P20LEMB7	24,2130		458
MIDAVBIT	4752	=	81	NKMLVBIT	4744	=	72	PHSBB1	E3,1437		110	P20LEMF	24,2231		500
MIDFBIT	4737	=	65	NKRUPTBIT	4750	=	73	PHSBB2	E3,1441		110	P20LMAT1	24,2241		500
MIDFBIT	4751	=	81	NKRUPTFLG	0107	=	73	PHSBB3	E3,1443		110	P20S2	25,2000	=	32
MKCVFLAG	0110	=	73	NKSTPR	36,2676		755	PHSBB4	E3,1445		110	P21	E6,1703	=	136
MKVAC	07,2014		244	NTARGBIT	4751	=	76	PHSBB5	E3,1447		110	P20N33	35,2004		617
MKVBS2	07,2620		260	NKVBKAT1	4445		466	PHSERP6	E3,1451		110	P41FJET	26,3207		748
MKVBS3	07,2617		260	NKVSURCOM	4170		454	PHSNAMES4	E3,1444		110	P41MANU	36,3221		747
MODE71	05,3465		826	NKWAITBIT	4742	=	72	PHSNAMES6	E3,1450		110	P41NORM	36,3316		749
MONIT1	41,3240		439	NKWAITFLG	0101	=	72	PHSPRDT5	1062		102	P52F	15,2102		921
MOCNBIT	4740	=	65	=====				PHSPRDT6	1065		102	P52V	15,2130		921
MRK1DBIT	4735	=	72	QCT00010	4750	=	233	FINRPRIT	4746	=	73	P57A	15,3336		967
MRK1DFLG	0074	=	72	QCT12100	06,3137		188	FINTEST	43,2002	=	468	P631GN1	36,2520		731
MRUPTBIT	4747	=	73	QCT10000	4737	=	219	PIPASCFY	E3,1455		110	P632CCM	35,3672		733
MRUPTFLG	0106	=	73	QCT11	4220	=	1087	PIPASCFZ	E3,1457		110	P65VERT	31,2517		809
MU(P)	0132	=	1238	QCT2	4747	=	741	P1PLSF	07,3265		1308	P66NCW?	21,2522		794
MULTFXIT	5620		1372	QCT203	26,2257		477	PLUSX	27,2423		762	P67NOW?	31,2426		793
MUM	13,2704		46	QCT21103	5700		1373	PMIAM	34,2103		635	P70IN1T	32,3571		826
MUNRVG	33,3125		875	QCT217	5704		1373	PCN2	27,2240		377	P70NGW?	21,2056		824
MWAITBIT	4741	=	72	QCT30000	4355	=	219	PCCH	04,2165		220	P707IBIT	4737	=	80
MWAITFLG	0110	=	72	QCT30002	6474	=	1091	PCCHBIT	4735	=	70	P71	21,2072		824
MXMYM?	26,2763		583	QCT37774	7732		1090	POSEMBL	27,2064		375	P71NCW?	21,2043		823

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SYMBOL	CEP	H PAGE	SYMBOL	DEF	H PAGE	SYMBOL	DEF	H PAGE	SYMBOL	CEP	H PAGE
=====			R610+L03	23,2156	520	SIGNRET	0125	= 96	TALAPW2	43,3305	1276
QUADGLIC	31,3141	832	R610+L1	23,2337	522	SIM2CADR	05,2454	212	TCCSM	E3,1622	112
QUITBIT	4747	= 81	R610+L2	23,2162	520	SINR	E5,1646	= 124	TCLFM	E3,1674	112
=====			R610+L2	23,2220	521	SLCPERTT	4751	= 68	TDECAYEX	477C	1086
RCDUFALL	1274	= 86	=====			SNAFAGN	05,3632	985	TEMP	E5,1441	= 128
RCDUFELG	0266	= 85	S+2	4752	= 1275	SNAPEND	05,3651	986	TEMPADC	E5,144C	= 128
RDIFF	E6,1452	= 133	S+3	6250	= 1275	SNGLCD	22,2376	358	TENCAPPR	E7,1424	129
RCM	13,3744	1238	S+4	4751	= 1275	SNLNSRLT	4751	= 75	TSTCCS	32,2673	605
RDSP	E5,1434	= 128	S+5	4756	= 1275	SCMEADS	20,3450	1490	TESTVB	41,2041	408
RECAL 2	4,3640	460	S+6	6245	= 1275	SCMEFRFR	37,3040	389	TETCTFER	E3,1570	= 112
REDOMANN	26,2131	475	S-2	7751	= 1276	SOPTION2	43,3344	1277	TFCCNIC	27,3360	1261
REGCDSEF	10,2471	1348	S-3	7750	= 1276	SCFTICA3	43,3345	1277	TFESWBIT	4753	= 78
PERCDEF	0265	= 85	S-4	6115	= 1276	SCPTION4	43,3346	1277	TFFTICK	22,3453	716
PERCSMAN	0270	= 85	SAVE	E5,1464	= 128	SOPTION5	43,3347	1277	TFI	E7,1453	= 140
RECFLXLOC	41,2207	410	SVVERLAG	1071	= 1362	SCFTICA6	43,3350	1277	TGOCALP	27,2464	764
REFRCALC	17,2475	1441	SRIT1	4753	= 1275	SCFTICN7	43,3351	1277	THCLMP	31,2315	789
RGEFTT	E7,1665	= 143	SRIT11	4742	= 1275	SCFTICN10	43,3352	1277	TICKTPER	22,3410	715
RHSCFLC	0313	= 87	SRIT12	4737	= 1275	SCPLLY	37,3071	390	TIMER	E5,1470	= 128
RLMUNIT	0014	= 596	SRIT14	4736	= 1275	SPEGSTS	27,2572	385	TMANLCHK	22,3064	367
RMM	12,2017	= 37	SPIT2	4752	= 1275	SPSCODE	4743	= 1299	TMEXITL	05,3703	586
RNGRDATA	0260	= 84	SPIT3	4751	= 1275	STARM	0040	= 125	TMRESUME	05,3705	586
RCC	04,2141	229	SPIT5	4747	= 1275	STARTCAP	16,2046	1401	TRACE1	40,2272	443
RQNTPS+1	0127	= 98	SPIT6	4746	= 1275	STARTMNV	26,2176	476	TRACE1S	40,2303	443
RCTELEIT	4746	= 81	SPIT8	4744	= 1275	STARTSLM	05,2452	212	TPLMBC	26,3111	585
RPAD1	23,2337	= 1273	SFLNDRM	17,3141	1446	STARTSTO	6437	1005	TSNEXTS	17,2226	1432
RCFLBIT	4735	= 78	SFL	22,2366	358	STARTSW	05,2451	212	TSSR	00,2025	1029
RCHECK	4576	526	SECAF	22,2027	352	STATXIT	E4,1516	= 116	TSTFCINT	23,3757	1254
RRDATAFL	0277	= 86	SFLC1	4777	= 756	STCLCK3	36,2671	736	TFSCALE	4740	= 821
RRICSVFC	1100	= 575	SFLC15	36,3754	756	STCESIC1	25,2627	548	TURNCN	17,3154	1446
RRNRBIT	4746	= 66	SFLC15DP	36,3753	756	STERN	31,2422	753	TURNCNFL	C302	= 86
RRSFLAG	0200	= 86	SFLC20P	36,3755	756	STCFHAPD	22,3600	720	T6JOB	17,2061	1394
RUPDATEF	33,3251	879	SFLC45	36,3760	756	STORHPR	22,3612	721	=====		
RUPSTGR	0063	= 55	SFLC45DF	36,3757	756	STRATEGY	14,2706	932	LAXIS	20,3322	1488
PVSWPBIT	4743	= 77	SFLFSLPR	40,2000	= 36	SUPERIOR	4745	= 1088	LCB2	0136	= 1495
RWAITK	43,2141	265	SENSCET	17,2146	1432	S32BIT1	4735	= 75	LCB3	0140	= 1495
P2ILEM1	24,2734	511	SFLCTP	21,3664	1498	S32BIT2	4736	= 75	UNFVX/2	E6,1667	= 137
R21ILEM3	24,2743	511	SFLINFL	05,2727	216	S32BIT3A	4737	= 75	UNKNOWN	0007	= 194
R22ILEM12	24,2457	516	SFLMARK	11,2527	1345	S32BIT3B	4740	= 75	UNLP/2	0024	= 151
R24ILEM1	24,2413	517	SFLTPIC	10,2511	1348	S3435.25	35,3237	673	UNL48/2	0024	= 151
R29?	32,2552	871	SFLTXFLAG	17,2667	= 844	S40.133	27,2647	768	UPCALIST	05,2407	= 194
R30CK	27,3766	1273	SFLTXACT	43,2105	263	S40.137	27,2641	768	UPDMINLE	42,2032	276
R51.2	14,3047	934	SFLCONST1	E5,1467	= 128	S50	14,2500	= 528	UFEND73	04,3517	1381
R51F	14,3034	934	SFLFT	41,3071	430	S52.2.1	14,3640	946	ULFLOCKFL	0164	= 78
R55.1	14,3223	938	SFLFT1	41,3052	430	=====			UPOK	04,3322	1329
R60INIT	32,3177	781	SHARTPQ	26,3015	584	TBASE3	1056	102	UPPART3	04,3543	= 1382

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SYMBOL	DEF	P PAGE	SYMBOL	DEF	P PAGE	SYMBOL	DEF	P PAGE	SYMBOL	DEF	P PAGE
UPRPT1	04,3313	1329	VWNN25	6010	= 210	ZCNC4	17,3427	1453	3.5SPCT	01,2065	240
UPTRCT	32,3662	828	VWNN34	4242	= 210	ZCNC4,5	17,3416	1452	3J2R2ML	13,2024	46
UPWAKE	04,3535	1382	VWNN14	22,2170	210	ZSC1	E5,1714	= 125	3JCEGCHK	24,3336	576
USEGTS	33,2336	857	VWNN17	11,3500	1362	=====	=====	=====	3JCKCHK	33,2472	869
USFQFLG	0304	= 87	VWNN71	07,2625	260	DEEANK	43,3362	1278	369SWBIT	4753	= 80
=====	=====	=====	V1	0114	= 933	=====	=====	=====	=====	=====	=====
VAC7	E4,1543	= 115	V2	0022	= 933	1.5SPCT	01,2027	239	4.11SPCT	01,2107	241
VAC1	0401	100	V3	0030	= 933	1.95SECS	33,3102	876	4.13SPCT	01,2112	241
VAC2	0455	100	V27XEQC	04,2361	233	1/RTNL	27,2030	46	4.15SPCT	01,2115	241
VAC3	0531	100	V5 KPCA	32,2171	210	1/10S	4753	= 1436	4.17SPCT	01,2120	241
VAC4	0605	100	V67FLR1	4744	= 77	1/10SEC	4753	= 1423	4.21SPCT	01,2123	241
VECTABND	E4,1574	= 115	V74	42,3062	= 289	1BITOP	26,2413	486	4.23SPCT	01,2126	241
VFHUPBIT	4744	= 67	VR2FMBIT	4752	= 78	1SECC	4777	= 382	4.25SPCT	01,2131	241
VELCHK	25,3232	558	=====	=====	=====	100MRUPT	7732	= 156	4.27SPCT	01,2134	242
VELDATA	0255	= 84	W.IND1	1257	= 107	120MS	5741	= 182	4.31SPCT	01,2137	242
VELUPDAT	33,3257	879	WCAIC	22,2746	365	17TC20	43,3664	1282	4.33SPCT	01,2142	242
VERIFLAG	0165	= 78	WHATOUT	21,2317	789	=====	=====	=====	4.35SPCT	01,2145	242
VER200	E6,1752	= 132	WPLAT1	E5,1560	= 129	2.0SPT	04,2126	229	4.37SPCT	01,2150	242
VERTDRET	37,2231	377	WPLAT0	E5,1464	= 129	2.11SPCT	01,2043	240	4.5SPCT	01,2101	241
VFLAGBIT	4742	= 70	WPCRTT	0115	= 96	2.11SPT	04,2127	229	4.7SPCT	01,2104	241
VINTERIT	4751	= 71	=====	=====	=====	2.13SPCT	01,2046	240	=====	=====	=====
VLAUNS	E5,1462	= 129	XDELVBIT	4744	= 69	2.15SPCT	01,2051	240	5.4SPCT	01,2161	242
VPD	0900	= 933	XDIFF	12,2163	1168	2.17SPCT	01,2054	240	5.5SPCT	01,2172	242
VPDVL	6576	1013	XKPCSM	E2,1624	112	2.21SPCT	01,2057	240	5.7SPCT	01,2175	243
VRECTLEM	E3,1634	112	XKEPLM	E2,1676	112	2.5SPCT	01,2035	240	5PLANK1	40,2557	406
VSTORF	6446	1009	XSVADR	37,2477	382	2.7SPCT	01,2040	240	5910	01,2477	1083
VUPDATED	33,3455	892	XITNPLT	E7,1611	= 143	2CZERC	12,2006	= 1129	=====	=====	=====
VVSC	7632	1037	=====	=====	=====	2RNCPC	40,3227	436	6.5SPCT	01,2203	243
VVXSC	7407	1032	ZEPDOP	12,2006	= 1093	2VEXHUST	E7,1742	= 765	6.7SPCT	01,2206	243
VXSCAL	33,2016	41	ZEPDQ	23,2523	= 1145	26SECS	36,3763	756	63/64+1	7731	1090
VYSCAL	33,2014	41	ZERCTJ	17,2620	1439	27TQ30	43,3672	1282	=====	=====	=====
VY	0006	= 933	ZCNC2	17,3606	1456	=====	=====	=====	70DEC	32,3567	826

HEALTH KEY: NORMALLY DEFINED UNLESS FLAGGED AS FOLLOWS:

UN UNDEFINED = DEFINED BY EQUALS J DEFINED BY JCKER OR FRASE ANYWHERE MD MULTIPLY DEFINED
 BC BADLY DEFINED CD DEFINITION ASSOCIATED WITH CONFLICT XX MISCELLANEOUS TROUBLE

ERASABLE & EQUALS CROSS-REFERENCE TABLE SHOWING DEFINITION, PAGE OF DEFINITION, AND SYMBOL

DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
0000	65	NEED2FLG	0010	1137	GAMRP	0016	1258	TFFC1	0026	1258	TFF1/ALF	0040	1193	R1
0000	92	Z	0010	1140	CVFCTR	0016	1264	RPER	0027	67	UPCATFLG	0040	1238	TCEC1
0000	137	UNX/2	0010	1140	QVFCTR	0017	67	NJETSFLG	0027	92	TIME4	0040	1258	NRMAG
0000	236	CESTALIN	0010	1140	SINNOCI	0017	92	BRURT	0030	68	ACLPFLG	0041	69	LCSCMFLG
0000	491	LP	0010	1193	ALPHA	0020	67	CICFLAG	0030	92	TIME5	0041	92	PIPAZ
0000	923	VPC	0010	1194	COGAMIN	0020	92	CYP	0030	93	CHAN30	0042	69	STEERSW
0000	1140	504RPP	0010	1195	MIA	0020	125	COSTH	0030	933	V2	0042	92	G-RFCCTR
0000	1238	RATT	0011	66	RPARSW	0020	929	CSUN	0030	979	TIMER	0042	93	LVSGIARE
0001	65	JSWITCH	0011	92	LRUPT	0020	979	STMP	0030	1193	XI	0042	126	RCNCFM
0001	92	L	0011	93	DSALVCUT	0020	1193	RECTMU	0030	1195	COSF	0042	1140	SCB
0001	93	ICFAN	0012	66	LCKCNSW	0020	1258	NRTERM	0030	1258	TFFRTALF	0042	1192	KEPC1
0001	236	AGSUPRAT	0012	92	GRUPT	0020	1264	PAPO	0031	68	TPACKFLG	0042	1258	TFFX
0002	65	MIDFLAG	0012	93	CHAN12	0021	67	ERACFLAC	0031	92	TIME6	0043	92	P-RFCCTR
0002	92	Q	0012	1193	XMAX	0021	92	SP	0031	93	CHAN31	0044	69	IMPULSW
0002	93	COHAN	0012	1258	TFFCCLG	0022	67	RODFLAG	0032	92	CDLX	0044	92	R-RFCCTR
0002	236	RENDEZVU	0013	66	NEECLEFLG	0022	92	CYL	0032	93	CHAN32	0044	93	LV
0003	65	MOCNFLAG	0013	92	SAMPTIME	0022	125	SINTH	0032	661	CELELC	0044	1150	NCRNZ1
0003	92	EBANK	0013	93	CHAN13	0022	151	PRCJ	0032	1140	BVECTR	0044	1193	KEPC2
0003	93	FISCALAR	0014	66	FREEFLAG	0022	596	LYVECTPR	0032	1193	S(XI)	0044	1258	TFFTEM
0003	236	CRBMANUV	0014	93	CHAN14	0022	929	CMOON	0032	1238	ML(R)	0045	69	XCELVFLG
0004	65	P21FLAG	0014	137	LAZ/2	0022	933	V2	0032	1238	TVEG	0045	92	INLINK
0004	92	FRANK	0014	596	RLMUNIT	0022	1140	504AZ	0032	1258	TFFALFA	0046	69	ETRIFLAG
0004	93	LOSCALAR	0014	596	UXVECTPR	0022	1193	1/RODTMU	0033	68	SLCPFSW	0046	92	RNRAC
0004	236	DESASCNT	0014	933	V1	0022	1238	CCSFH1/2	0033	92	CDLY	0046	93	X1
0005	66	FSPASFLG	0014	1192	XMTN	0022	1258	RTERM	0033	93	CHAN33	0047	69	FINALFLG
0005	92	Z	0014	1194	CCCCA	0023	92	EDCF	0034	68	GLESSW	0047	92	GYRCMD
0005	93	CHANS	0014	1195	DELINDER	0024	67	R61FLAG	0034	92	CCL2	0047	93	X2
0005	236	LUNRSALN	0014	1238	TAT	0024	92	TIME2	0034	93	DNTM1	0050	69	AVFLAG
0006	66	P25FLAG	0014	1258	PWAG1	0024	125	TETA	0034	1193	XSCC(XI)	0050	92	CCLXCMD
0006	92	FRANK	0015	66	P10FLAG	0024	151	UNLP/2	0034	1258	TFFNF	0050	93	S1
0006	93	CHAN6	0015	92	ZRUPT	0024	151	UNLPB/2	0035	92	CDLT	0050	1140	RPREXIT
0006	137	UNY/2	0015	93	MNKYVIN	0024	522	PHI	0035	93	DNTM2	0050	1195	TWEEKIT
0006	491	IRP	0016	66	CLOSFLG	0024	1140	AVECTP	0036	68	DRIFTFLG	0051	69	FFRATFLG
0006	933	VO	0016	92	BANKRLPT	0024	1140	MMATRIX	0036	92	CDLS	0051	92	CCLYCND
0006	1140	504F	0016	93	NAVKYVIN	0024	1193	X	0036	933	CPC	0051	93	S2
0006	1238	VATT	0016	929	CFARTF	0024	1238	UZ	0036	1193	T	0051	1131	SETRFX
0006	1250	89	0016	932	CSS	0024	1238	VATT1	0036	1195	CEP	0051	1140	EARTHMXx
0007	66	TMUSE	0016	1140	TJMSUBM	0024	1258	TFFVSC	0036	1258	TFF/RTMU	0052	69	CALCMAN3
0007	93	SUPERPNK	0016	1140	534LPL	0025	92	TIME1	0037	68	SRCHORTN	0052	92	CCLZCMD
0007	194	SPASZFRQ	0016	1193	1/MU	0026	67	VEHLPPFLG	0037	92	PIFAX	0052	92	QPRET
0007	194	SPARE	0016	1194	COGAMAX	0026	92	TIME2	0040	68	ACMCDFLG	0053	70	CALCMAN2
0007	194	UNKNCWN	0016	1195	MAX	0026	125	FCA	0040	92	PIPAY	0053	92	CCLTCMD
0010	66	RNFVZFLG	0016	1238	RATT1	0026	125	ZPRIME	0040	125	STARM	0054	70	NDCCLFLG
0010	92	ARUPT	0016	1238	UPPV	0026	979	GTMP	0040	932	DF1	0054	92	CCLSCMD
0010	93	OUTG	0016	1258	COELF/2	0026	1195	ITFCTR	0040	1140	CCB	0055	70	POGFLG

ERASABLE & EQUALS CROSS-REFERENCE TABLE SHOWING DEFINITION, PAGE OF DEFINITION, AND SYMCEL

DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
0055	93	THRLST	0070	95	RLPTRREG1	0112	96	LASTYCMD	0124	96	LCITEMIN	0137	97	WDCNT
0056	74	GLOCKFAIL	0071	1290	TEMPPR	0113	73	DSKYFLAG	0124	96	SFTTEMP2	0137	1495	UCB4
0056	93	LEMCNM	0071	71	VINTFLAG	0113	96	LASTXCMD	0124	98	DXCRIT	0140	97	DSPMMTEM
0057	70	PEFSMFLG	0071	95	PLPTRREG2	0114	96	BLANKPET	0124	1495	1/ATFM2	0140	97	NATINC
0057	93	CUTLINK	0071	1290	TEMPR2	0114	96	DSFXIT	0125	74	ACPBSEFLG	0140	97	MAXCVSW
0060	70	LUXAFLAG	0072	71	D6CR9FLG	0114	96	EXITEM	0125	96	MIXTEMP	0140	97	MIXRF
0060	93	ALTM	0072	95	RLPTRREG3	0114	96	INTB15+	0125	96	SIGARET	0140	97	POLYCNT
0061	70	NCF29FLG	0072	1290	TEMPF2	0114	1495	CBVAL2	0125	98	DXCRIT+1	0140	98	FWRCNT
0061	95	EXECITEM1	0073	71	DIM0FLAG	0115	74	SNUFFFP	0126	75	NCFRMCON	0140	1495	UDB3
0061	95	ITEMP1	0073	95	DSRUPTEM	0115	96	DECRET	0126	98	RCCTPS	0141	76	MUNFLAG
0061	95	WAITEXIT	0073	95	KEYTEMP1	0115	96	INTBIT15	0127	75	SCINSW	0141	97	DSREL
0061	138	T5TEMP	0073	95	PLPTRREG4	0115	96	WDRET	0127	98	RCCTPS+1	0141	97	PCLYRET
0061	1290	TEMPR	0073	1290	TEMPRBCN	0115	96	WRDRET	0127	1495	1/ACCSTT	0141	97	TEM1
0061	1495	QDSMG	0074	65	FLAGWRD0	0115	96	21/22PEG	0130	75	MGLVFLAG	0141	98	CERPTP
0062	70	VFLAG	0074	72	WRKIDFLG	0115	1495	CBVAL3	0130	96	BLF	0141	1495	UAXCIST
0062	95	EXECITEM2	0074	95	STATI	0116	74	NOTHPQTL	0130	97	INDEXLCC	0142	97	CSMAC
0062	95	ITEMP2	0075	67	FLAGWRD1	0116	96	APCFWC	0130	97	SWWORD	0142	97	ICADDTM
0062	95	WAITBAK	0075	72	PRIDFLG	0116	1495	DRIETFR	0130	123	APVEL*	0142	97	TEM2
0062	1290	TEMPR	0076	68	FLAGWRD2	0117	74	R77FLAG	0130	123	L*WCR*T	0142	98	DEPCCF-E
0063	70	P04FLAG	0076	72	NPMIDFLG	0117	96	CHAR	0131	75	REACHFLG	0142	98	CEXDEX
0063	71	REACHFLG	0077	70	FLACWRD3	0117	96	DECOLNT	0131	97	SWBIT	0143	76	RECFLAC
0063	95	ITEMP3	0077	72	PDSFFLAG	0117	96	EPCNT	0131	123	H*CHCR*T	0143	97	CCUNT
0063	95	NEWPRIO	0100	71	FLAGWRD4	0117	96	PCLISH	0131	123	VSELECT*	0143	97	TEM3
0063	95	RLPTSTCP	0100	72	NWAITFLG	0117	96	UPDATRET	0131	1495	ZITEM	0143	98	CEPCCF-7
0063	95	WAITADR	0101	72	NWAITFLG	0117	98	PWRPTR	0132	75	S32.1F1	0143	98	DEX1
0063	138	CINFX	0101	73	FLAGWRD5	0117	1495	ACCRETRA	0132	98	RFTRCCT	0143	98	CEX1
0063	1290	TEMPRM	0102	72	NPKAVFLG	0120	74	RNGSCFLG	0132	1495	ZSTEM	0143	1495	CEB1
0063	1468	NACCDOT	0102	75	FLAGWRD6	0120	96	FIXLFC	0133	75	S32.1F2	0144	97	DSPWDRET
0064	71	PPFCIFLG	0103	72	NRMNVFLG	0121	74	DMENFLG	0133	97	BLF2	0144	97	FREERET
0064	95	ITEMP4	0103	77	FLAGWRD7	0121	96	CVFIND	0134	75	S32.1F3A	0144	97	LSTPTR
0064	95	LCCCTR	0104	72	PRONVFLG	0122	74	ZOOMFLAG	0135	75	S32.1F3B	0144	97	RELRET
0064	95	WAITTEMP	0104	78	FLAGWRD8	0122	96	DECTEM	0135	97	DMFATEMP	0144	97	SEPMMFET
0064	1290	TEMPR2	0105	73	PINBFFLG	0122	96	EISTEM	0135	97	MPTEMP	0144	97	SEPSECRET
0065	71	CULTFLAG	0105	80	FLAGWRD9	0122	96	NCLATFM	0135	1495	LCE1	0144	97	TEM4
0065	95	ITEMP5	0106	73	NRLPTFLG	0122	96	SCNEN	0136	97	DETLNC	0144	98	DERCCF-6
0065	95	NEWLFC	0106	82	FLGWRD10	0122	96	VBLF	0136	97	CVSIGN	0144	98	DEX2
0065	1290	TEMPR3	0106	92	RSEFLAG	0122	1495	ACCSW	0136	97	ENTRET	0144	1495	CEB2
0066	71	ORRWFLAG	0107	73	NRLPTFLG	0123	74	ENGCAFLE	0136	97	ESCAPE	0145	97	NCLNACO
0066	95	ITEMP6	0107	83	FLGWRD11	0123	96	HITEMIN	0136	407	ENEXIT	0145	97	TEM5
0066	1290	TEMPR4	0110	73	NKCVFLAG	0123	96	NVTEMP	0136	1495	UDB2	0145	98	CERCCF-5
0066	1466	CRNL12	0110	95	FLGWRD12	0123	96	SFTMPPI	0137	76	CMCCFVSW	0145	98	RINSAVER
0066	1468	GRNDXFP	0110	85	RACMODES	0123	96	SGNCF	0137	97	ECTRET	0145	1495	CEB4
0067	71	DATEFLG	0111	87	DATECCLS	0123	1495	1/ATFHL	0137	97	DVNDORMCT	0146	76	NARGFLG
0067	95	NFWJOB	0111	87	FLGWRD13	0124	74	3AXISFLG	0137	97	ESCAPE2	0146	97	NACTEM
0070	71	INTYPFLG	0112	73	XDSFFLAG	0124	96	CODE	0137	97	INREL	0146	98	CEPCCF-4

ERASABLE & EQUALS CROSS-REFERENCE TABLE SHOWING DEFINITION, PAGE OF DEFINITION, AND SYMBOL

DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
0146	1495	DEBB	0161	78	IDLEFLAG	0215	81	LEFTABORT	0312	87	DRIFTDFL
0147	76	ALXFLAG	0161	1363	CLTHERE	0216	81	FLAP	0313	87	RFCSCFLG
0147	97	ANTYPTFM	0161	1486	MASSCTR	0220	81	RCFLAG	0314	88	ULLAGFLG
0147	98	DERCOF-3	0161	1486	SCRATCHY	0221	81	QUITFLAG	0314	99	R22DISP
0147	1495	AXOSTEM	0161	1496	ARET	0223	81	MDIFLAG	0314	99	TIMEZSAV
0150	77	ATTFLAG	0162	78	V37FLAG	0224	81	MDAVFLG	0315	88	DESL2FLG
0150	97	IDADITEM	0162	421	MFAC+6	0225	81	AVENTDSW	0316	88	DBSELFLG
0150	99	DERCOF-2	0162	1363	GENMASK	0227	82	INTFLAG	0316	99	SCALSAVF
0151	77	ITSWICH	0162	1486	SCRATCHZ	0230	82	APSFLAG	0317	88	ACCCFLG
0151	97	IDAD2TFM	0162	1496	ARSACS	0236	82	REINTFLG	0320	88	AUTR2FLG
0151	98	DERCOF-1	0163	78	AVEGFLAG	0245	83	LRBPASS	0320	99	RECCCTR
0151	1495	FLATEMP	0163	99	NCDF	0250	83	VXINH	0321	88	ALTRIFLG
0152	77	MANUFLAG	0163	1363	LSFRPRIO	0251	83	ESTHIGAT	0321	99	CPFI
0152	98	DERCOFM	0163	1466	SIGNACS	0252	84	NOLPREAD	0321	99	THFTAC
0152	98	IDAF3TFM	0164	78	UPLCKFL	0253	84	XCRFLG	0322	99	CTFETA
0152	1495	Z3TFM	0164	99	LDC	0254	84	LPINH	0323	99	CPSI
0153	77	IGNFLAG	0164	1363	CCFINDEX	0255	84	VCLDATA	0324	99	DELV
0153	98	DERCOF+1	0164	1496	-SIGNACS	0256	84	LFC52FLG	0324	99	DELVX
0153	98	PJTVXTFM	0165	78	VERIFLAG	0257	84	READVFL	0326	99	DELVY
0154	77	ASTNFLAG	0165	99	BANKSET	0260	84	RNGEDATA	0330	99	DFLVZ
0154	99	MRAC	0165	1362	MFAC2SAV	0261	84	AC511FLG	0332	99	KEYTEMP2
0154	1298	TEMPRES	0165	1496	HOLD	0262	84	VFLSHFLG	0332	99	RLPTAGN
0154	1363	FACFRFG	0166	78	V82MFLO	0263	85	FFLSHFLG	0333	99	DNLSTADP
0154	1496	UV	0166	99	PLSHLCC	0264	85	CFESFLAG	0333	99	CNLSTCCP
0155	77	SWANDISP	0167	78	TESSA	0265	85	RMODFLG	0334	99	LDATALST
0155	1298	TEMP2G	0167	99	FRICITY	0266	85	RCDUFLG	0334	987	CTLIST
0155	1363	PLAYTEM1	0177	78	RPQFLAG	0267	85	ANTENFLG	0335	99	CNTMCTC
0155	1486	-FESTLFM	0172	79	NEWIFLG	0270	85	REPOSMCN	0336	99	OLMPLCC
0155	1486	FPSILON	0173	37	MCCNCTH	0271	85	CFSIGFLG	0336	99	TMINDEX
0156	77	NCRMSW	0173	79	MCCCNFLG	0272	86	ALTSCLF	0336	987	CNECACR
0156	1298	PCINTER	0174	37	MCCNTHS	0273	86	LV8LFLG	0337	99	CNG
0157	77	RVSX	0174	79	LMCCNFLG	0274	86	PCDLFAIL	0337	987	SLELIST
0157	98	TERM1TMP	0175	79	FLUNDISP	0275	86	LRPCSFLG	0340	100	DNTMBLFF
0157	1298	TEMPRSWCH	0177	79	SLRFLAG	0276	86	LPALTFLG	0366	100	REFSTREG
0157	1362	CDMPAC	0201	79	INFNFLG	0277	86	RRODATAFL	0367	100	NVWCRC
0157	1363	PLAYTEM2	0201	79	CRDRSW	0300	86	RPRSFLAG	0370	100	MARKNV
0157	1486	DOCKTEMP	0202	79	APSESX	0301	86	ALTCODE	0371	100	NVSAVE
0157	1496	ANET	0203	80	COGFLAG	0302	86	TURNONFL	0372	100	CAERFLSH
0157	1496	FLATEM	0205	90	INITALGN	0303	87	FULSEFLG	0373	100	CADRMARK
0160	77	V67FLAG	0206	80	360SW	0304	87	CSFGFLG	0374	100	TEMPFLG
0160	1362	TEMP2P2	0211	80	FLVR	0305	87	CMDKFLG	0375	100	FAILPEG
0160	1363	PLAYTEM4	0211	80	P7071FLG	0306	87	CLPRCFLG	0400	100	VACIUSE
0160	1486	COFFCTR	0212	90	FLPF	0307	87	ACC4-2FL	0401	100	VAC1
0160	1486	SCRATCHX	0213	80	FLFT	0310	87	ACRBTFLG	0454	100	VAC2LSF
0160	1496	1/ANET	0214	80	FLRCS	0311	87	XCVINFLG	0455	100	VAC2
									0530	100	VAC3USE
									0531	100	VAC3
									0604	100	VAC4USE
									0605	100	VAC4
									0660	100	VAC5LSF
									0661	100	VAC5
									0705	1298	GCLCC
									0734	100	ACTCODE
									0734	100	STARCODE
									0735	100	SINCDL
									0735	100	SINCDLY
									0735	100	STARALGN
									0737	100	SINCDLZ
									0741	100	SINCDUX
									0743	100	CCSCDL
									0743	100	CCSCDLY
									0745	100	CCSCDLZ
									0747	100	CCSCDLX
									0751	100	-PHASE1
									0752	100	PHASE1
									0753	100	-PHASE2
									0754	101	PHASE2
									0755	101	-PHASE3
									0756	101	PHASE3
									0757	101	-PHASE4
									0760	101	PHASE4
									0761	101	-PHASE5
									0762	101	PHASE5
									0763	101	-PHASE6
									0764	101	PHASE6
									0765	101	COLSPCT
									0765	101	CCUSPCTY
									0767	101	COLSPCTZ
									0771	101	COLSPCTX
									0773	101	MINDEX
									0774	101	MNUMBER
									0775	101	CSPCNT
									0776	101	CSPCCLNT
									0777	101	DECBRACH
									1000	101	VEREREG
									1001	101	NCLAREC
									1002	101	XREG
									1003	101	YREG
									1004	101	ZREG
									1005	101	XREGFLF

FRASABLE & EQUALS CROSS-REFERENCE TABLE SHOWING DEFINITION, PAGE OF DEFINITION, AND SYMBOL

DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
1006	101	HITEMOUT	1070	1362	MARKFLAG	1163	104	TEMPER60	1276	106	DELPERCP	1356	108	WHCHREAD
1006	101	YRFCLP	1071	103	ERANKTEM	1164	104	FRICTIME	1277	106	IMCDES30	1357	108	SELFERRAS
1007	101	LCTEMCLT	1071	1362	SAVEFLAG	1165	104	UPVERBSV	1300	106	IMCDES32	1357	108	SFALL
1007	101	ZPECLP	1072	103	MARK2PAC	1166	104	EBL2	1301	106	IMCAGR	1360	108	ERESTORE
1010	101	MCDREF	1073	102	RLSAVE	1166	104	INTWAK1Q	1301	106	MCDCAOR	1361	108	SFLFFET
1011	101	DSPLCK	1074	102	1/PIPADT	1166	104	LPTMP	1302	106	CFTCACP	1362	108	SNODE
1012	101	REQRET	1075	103	TEMK	1166	1216	INTWAKLC	1303	106	RACCACP	1363	108	ALMCACR
1013	102	LOADSTAT	1076	103	SC	1167	104	COMPNUMB	1304	106	ATTICADR	1365	108	ERCCLNT
1014	102	CLPASS	1077	103	SAMPLEW	1170	104	UPCLDMCD	1306	106	ATTIPRIQ	1366	108	SCOUT1
1015	102	ACUT	1100	103	RRTARGET	1171	104	UPVERR	1307	106	MAPKSTAT	1371	108	SKEEP1
1016	102	NCLNCADR	1100	103	RLSCC	1172	104	UPCCUNT	1310	106	DSRUPTSW	1372	108	SKEEP2
1017	102	MONSAVE	1100	102	SAMPLESUM	1173	104	UPCLFF	1311	106	LCYRC	1373	108	SKEEP3
1020	102	MONSAVE1	1100	575	RFLOSVFR	1217	105	RM	1312	106	RRRET	1374	108	SKEEP4
1021	102	MONSAVE2	1100	607	LCSSW	1225	105	VN	1313	106	RDES	1375	108	SKEEP5
1022	102	CSPTAR	1104	102	TIMEFOLD	1233	105	PIPTIME	1314	106	RFINDEX	1376	109	SKEEP6
1036	102	NGTEM	1106	103	MCDFA	1235	105	GCT/2	1315	106	WIXA	1377	108	END-LE
1037	102	AVBNKTEM	1106	102	TANG	1235	553	CLRSCP	1316	106	WIXR	1377	108	SKEEP7
1040	102	VERESAVE	1110	103	MODER	1237	553	SP1RAL	1317	106	ZIXA	E3,1400	110	LST1
1041	102	CADRSTOR	1110	103	NSAME	1241	553	PCSOCODE	1320	107	ZIXB	E2,1410	110	LST2
1042	102	DSPLIST	1112	103	DESRET	1242	105	MASS	1321	107	AGSWCRD	E3,1432	110	PSREQ
1043	102	CLTVBACT	1112	103	CLDATAGE	1243	105	WEIGHT/G	1322	107	RATEINDEX	E3,1434	110	LCNGFXIT
1044	102	DSPTFM1	1113	103	DESCLCNT	1245	105	ABCELV	1323	107	DELAYLOC	E3,1436	110	FFSNAME1
1044	102	NORPTFM1	1114	104	TDEC	1246	105	PGUIDE	1326	107	LEMMASS	E3,1437	110	FFSBB1
1047	102	DSPTFM2	1116	104	CLLREC	1250	105	DVTHUSF	1327	107	CSMMASS	E3,1440	110	FFSNAME2
1050	102	DSPTFMX	1117	104	LAT	1251	105	AVGCEXIT	1330	107	CNRRANGE	E3,1441	110	FFSBB2
1050	102	CPTICNX	1121	104	LONG	1251	105	AVGEXIT	1331	107	CNRRDCT	E3,1442	110	FFSNAME3
1052	102	TBASE1	1123	104	ALT	1253	105	TEMX	1332	107	CNINDEX	E3,1443	110	FFSBB3
1053	102	PHSPRCT1	1125	104	YV	1254	105	TEMY	1333	107	CNIRVELX	E3,1444	110	FFSNAME4
1054	102	TBASE2	1133	104	ZV	1255	105	TEMZ	1334	107	CNIRVELY	E3,1445	110	FFSBB4
1055	102	PHSPRCT2	1141	104	P4C/RET	1256	105	PIPAGE	1335	107	CNIRVELZ	E3,1446	110	FFSNAME5
1055	823	PIPCTR	1142	104	GENRET	1256	107	W.LIND	1336	107	CNIRALT	E3,1447	110	FFSBB5
1056	102	TBASE3	1143	104	CPTICN1	1257	105	CHSMASK	1337	107	BALLEXIT	E3,1450	110	FFSNAME6
1057	102	PHSPRCT3	1144	104	CPTICN2	1257	107	W.LIND1	1340	107	CAPDATR1	E3,1451	110	FFSBB6
1057	234	MNTEMP	1145	104	CPTICN3	1260	105	CHSMASK	1341	107	TEVENT	E3,1452	110	FEIASX
1060	102	TBASE4	1146	104	LCNGCADR	1261	105	SPNCX	1343	107	DB	E3,1452	110	PIPARIAS
1060	234	BASITEMP	1150	104	LCNGBASE	1262	105	RCSEFLAGS	1343	1496	DBVAL1	E3,1453	110	PIPASCF
1061	102	PHSPRCT4	1152	104	LCNGTIME	1263	105	TSADR	1344	108	AZ	E3,1453	110	PIPASCFX
1062	102	TBASE5	1154	104	CDUTEMFX	1265	105	CL3QSAV	1345	108	EL	E3,1454	110	PBIASY
1063	102	PHSPRCT5	1155	104	CDUTEMPY	1266	105	CL3FSAV	1346	108	WCHFFASE	E3,1455	110	PIPASCFY
1064	102	TBASE6	1156	104	CDUTEMP2	1267	105	RADTIME	1347	108	ES22R2	E3,1456	110	PBIASZ
1065	102	PHSPRCT6	1157	104	PIFATMPX	1270	106	RADCEL	1350	108	ES22IRM	E3,1457	110	PIPASCFZ
1066	102	NVWCOR1	1160	104	PIFATMPY	1271	106	TTOTIG	1351	108	SKLSKAL	E3,1460	110	NECX
1067	102	FBANKSAV	1161	104	PIFATMPZ	1273	106	FVALVEST	1353	108	SKALSKAL	E3,1461	110	NBDY
1067	1362	DSPLFG	1162	104	DISPDEX	1274	106	DELPERCP	1354	108	TRUNCNMC	E3,1462	110	NECZ
1070	103	MARKBAN	1162	149	P21CPIG	1275	106	DELGERCR	1355	108	SHAFTCMD	E3,1463	111	ACIAX

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DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
E3,1464	111	AD1AY	E3,1706	112	TEFFHY	E4,1467	115	ALPHAM	E4,1602	116	RPADTEM	E4,1672	120	FBEAANB
E3,1465	111	ADIAZ	E3,1706	113	TIMSARC	E4,1471	115	BETAM	E4,1602	116	RRATF	E4,1672	120	RDDTD
E3,1466	111	ADSPAX	E3,1711	112	AZC	E4,1473	115	TAL.	E4,1602	116	WAVEL	E4,1674	117	DELVEET2
E3,1467	111	ADSPAY	E3,1713	112	-AYC	E4,1475	115	DT/2	E4,1602	119	BETAS8	E4,1674	120	YDCTD
E3,1470	111	ADSPAZ	E3,1715	112	AXO	E4,1477	115	F	E4,1602	119	FR-ELEV	E4,1676	120	ZDCTC
E3,1471	111	COMMAND	E3,1717	112	R-OTHER	E4,1501	115	GMODE	E4,1602	119	YAWANG	E4,1700	120	/R/NAC
E3,1471	111	GOOMP	E3,1717	121	R(CSM)	E4,1502	115	IRETURN	E4,1604	116	RTFET4	E4,1702	117	RACT1
E3,1474	111	CCUINC	E3,1725	112	V-OTHER	E4,1503	115	NORNGAM	E4,1604	116	TSTART82	E4,1702	118	CVLCS
E3,1477	111	GOCMRSW	E3,1725	121	V(CSM)	E4,1504	115	RRQV	E4,1604	116	WXBIA5	E4,1702	120	LAXIS
E3,1500	111	DIFREQCNT	E3,1733	112	REFSYMAT	E4,1504	116	BASETHV	E4,1604	119	RLM	E4,1710	117	RACT2
E3,1501	111	UPSVFLAG	E3,1735	112	ACTCMT	E4,1512	115	KFRPTN	E4,1606	116	RCME	E4,1710	118	ULCS
E3,1502	111	RRECT	E3,1757	113	LS21X	E4,1512	115	CR1CFX	E4,1606	118	RRASS36	E4,1710	120	YDCT
E3,1510	111	VRECT	E3,1760	113	LOSVEL	E4,1513	115	RQV	E4,1614	116	VCNE	E4,1712	120	ZDCT
E3,1516	111	TE1	E3,1760	113	VSUBC	E4,1513	116	BASETIME	E4,1614	118	LNFB6	E4,1714	120	GEFF
E3,1520	111	DELTA V	E3,1760	607	LCSSV1/4	E4,1515	116	CRIG	E4,1615	118	AGSBUFFF	E4,1716	118	FARC
E3,1526	111	TNLV	E3,1766	113	MLCSV	E4,1516	116	STATEXIT	E4,1622	117	CELCV	E4,1716	118	NCMTR1
E3,1534	111	QCV	E3,1766	607	SAVECOUT	E4,1517	115	FAROX	E4,1630	117	ECL	E4,1716	118	RTSR1/MU
E3,1542	111	VCV	E3,1770	113	RANGEVAR	E4,1517	116	BASECTV	E4,1630	117	CSAV	E4,1716	121	G(CSM)
E3,1550	111	TC	E3,1772	113	RATEVAR	E4,1521	115	HPEPX	E4,1630	117	KEL	E4,1720	118	FPER
E3,1552	111	XKFF	E3,1774	113	RVARMIN	E4,1521	115	FPSV	E4,1630	117	MEI	E4,1720	118	RTML
E3,1552	126	XPREV	E3,1775	112	VVARMIN	E4,1527	115	XKFFNEW	E4,1630	117	MFS	E4,1722	119	RINIT
E3,1554	111	RRECTCSM	E3,1776	113	TCCF	E4,1531	115	VECTAB	E4,1630	117	VZBEA*NB	E4,1724	121	WM
E3,1554	111	FRECTOTH	E3,1777	113	END-ERR	E4,1537	115	VACX	E4,1636	117	EO2	E4,1730	115	VIN1T
E3,1562	111	VRECTCSM	E4,1400	114	MEMORY	E4,1537	116	BASECTP	E4,1636	117	VYBEA*NB	E4,1732	121	/LONC/
E3,1570	112	T-OTHER	E4,1400	114	WRENDPCS	E4,1537	116	V82FLAGS	E4,1636	117	YNBSAV	E4,1734	120	LRXCCLDL
E3,1570	112	TCTCM	E4,1400	118	TRANS1	E4,1540	116	TFF	E4,1644	117	VXBEA*NB	E4,1734	120	Y
E3,1570	112	TCTCTHER	E4,1401	114	WRENDVEL	E4,1541	115	VACY	E4,1644	117	ZNBSAV	E4,1735	120	LRXCCLDL
E3,1572	112	DFLTAGSM	E4,1402	114	WSHAFT	E4,1542	116	-TPEP	E4,1652	117	LRVTIME	E4,1736	119	VIPRIME
E3,1600	112	NUVCSM	E4,1403	114	WTRLN	E4,1543	115	VACZ	E4,1652	117	T1TCT2	E4,1736	120	LRXCCLDL
E3,1606	112	RCVCSM	E4,1404	114	RMAX	E4,1545	115	XNBRTIP	E4,1652	118	+NCA	E4,1736	121	CRCCT
E3,1614	112	VCVCSM	E4,1405	114	VMAX	E4,1553	115	YNBPIP	E4,1654	117	LRXCDD	E4,1737	120	LRVTIMDL
E3,1622	112	TCCSM	E4,1406	114	WSUPPEPOS	E4,1561	115	ZABPIP	E4,1654	117	T2TCT3	E4,1740	121	YDCT
E3,1624	112	XKFCRSM	E4,1407	114	WSUPVEL	E4,1567	115	VONE*	E4,1655	117	LRXCDD	E4,1742	121	DDCT
E3,1626	112	RRECTHIS	E4,1410	114	SHAFTVAR	E4,1567	116	BASETHF	E4,1656	117	ELEV	E4,1744	119	FCAIX
E3,1626	112	RRECTLEM	E4,1411	114	TRUNVAR	E4,1574	115	VCTABND	E4,1656	117	LRXCDD	E4,1744	121	FCCNS
E3,1634	112	VRECTLEM	E4,1412	114	504LM	E4,1575	120	REAILCNT	E4,1657	117	PIRTEM	E4,1745	119	FCAIY
E3,1642	112	TCTLEM	E4,1420	114	AGSK	E4,1576	116	ERSILCNT	E4,1660	117	UP1	E4,1746	119	FCAIZ
E3,1642	112	TCTHIS	E4,1422	114	RLS	E4,1600	116	PERMIN	E4,1660	118	LARM	E4,1746	121	YCCNS
E3,1644	112	DFLTALFM	E4,1422	118	ALFDR	E4,1600	116	RANGE	E4,1662	120	AT	E4,1747	119	DELVTFF
E3,1652	112	NUVLEM	E4,1430	114	RRODY	E4,1600	116	WRCS	E4,1662	120	VFCRIZ	E4,1750	121	FRATE
E3,1660	112	RCVLEM	E4,1431	115	ALFHAV	E4,1600	118	AGSBUFF	E4,1664	120	ANGTERV	E4,1751	119	LMFCS
E3,1666	112	VCVLEM	E4,1437	115	RTAV	E4,1600	119	ALPHASB	E4,1664	120	VE	E4,1752	121	YRATE
E3,1674	112	TCLM	E4,1445	115	PHIV	E4,1600	119	RTCHANG	E4,1666	117	DELVFET1	E4,1754	121	ATY
E3,1676	112	XKFERLEM	E4,1453	115	PSIV	E4,1600	119	RR-AZ	E4,1666	120	TTC	E4,1756	121	ATR
E3,1700	112	X789	E4,1461	115	FV	E4,1600	119	RSTACK	E4,1670	120	TBLP	E4,1757	119	LMVEL

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DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
E4,1760	121	ATP	E5,1436	122	RAPFG	E5,1476	122	PTGNZ	E5,1550	129	DELM	E5,1664	124	XCC
E4,1762	121	YAW	E5,1436	128	CDUTIMEF	E5,1476	129	ANGY	E5,1552	123	K1FARM	E5,1664	124	XNB
E4,1764	121	PITCH	E5,1436	129	WANGI	E5,1500	122	KIGNX/B4	E5,1554	123	J2FARM	E5,1664	127	DELTA>
E4,1765	119	DELVEFT3	E5,1440	128	CDUANG	E5,1500	129	ANGX	E5,1556	123	K2FARM	E5,1664	127	TRIFA
E4,1773	120	RTSTDEX	E5,1440	128	TEMPACC	E5,1502	122	KIGNY/B8	E5,1560	123	THETCR17	E5,1667	127	TEMPVAR
E4,1774	120	RTSTMAX	E5,1440	129	TORCNOX	E5,1502	129	CRIFTC	E5,1560	129	WPLATI	E5,1670	126	TCESTRED
E4,1775	120	RTSTBASE	E5,1440	129	WANGT	E5,1504	122	KIGNV/B4	E5,1562	123	RAMIN	E5,1672	124	YCC
E4,1776	120	RTSTLOC	E5,1441	128	CDLRFADF	E5,1504	129	CRIFT1	E5,1562	129	GFCCCMPS	E5,1672	124	YNB
E4,1777	120	PSAMPPT	E5,1441	128	TEMP	E5,1506	122	LCWCRT	E5,1563	129	ERCCMP	E5,1672	126	CEOMSCN
E5,1400	120	END-E4	E5,1442	128	CDUREACI	E5,1507	122	HIGHCRIT	E5,1564	123	YLM	E5,1673	126	LN
E5,1400	122	TLAND	E5,1442	128	NCB1TS	E5,1510	122	V2FC	E5,1566	123	ABTPCCT	E5,1700	124	ZFC
E5,1400	122	W	E5,1442	129	DRIFTT	E5,1510	129	VLAUN	E5,1570	123	CCSTFET1	E5,1700	124	ZNB
E5,1400	128	AZIMUTH	E5,1443	128	GCULLIMIT	E5,1512	129	ACGWG	E5,1571	129	ZEPONDX	E5,1701	126	VTARGET
E5,1402	122	PBRFG	E5,1443	128	CHAN	E5,1516	122	TALVEPT	E5,1572	123	CCSTFET2	E5,1702	126	VTARGET
E5,1402	128	LATITUDE	E5,1444	122	VAPFG	E5,1520	122	DELFIX	E5,1572	129	ISFCXT	E5,1706	124	GACC
E5,1402	820	PDG	E5,1444	128	LCS1	E5,1520	129	FCSNV	E5,1573	129	ASECXT	E5,1706	124	LANDLAT
E5,1404	128	FRVECTOR	E5,1444	129	ALX1S	E5,1522	122	LPALPHA	E5,1574	123	CG	E5,1706	124	STARAC
E5,1410	122	VBREF	E5,1445	129	CMFX1	E5,1522	129	CP1PAY	E5,1574	129	PERFDLAY	E5,1706	124	VEARTH
E5,1410	820	VDR	E5,1446	129	ALK	E5,1523	123	LPBETA1	E5,1574	848	ASCSAVE	E5,1706	125	CULTRIX
E5,1412	128	LENGTHOT	E5,1452	122	AAPEFG	E5,1524	123	LPALPHA2	E5,1576	129	CVFLCWCK	E5,1706	125	XSC1
E5,1413	128	LCSVEG	E5,1452	128	LCS2	E5,1525	123	LRBETA2	E5,1616	123	CUTOPLN	E5,1706	127	VAP1ANCE
E5,1414	128	NCXCTR	E5,1452	129	THEFAN	E5,1526	123	LPVMAX	E5,1616	123	RANGEESP	E5,1710	124	LANCLCNC
E5,1415	128	P1PINDEX	E5,1460	122	VAPFG*	E5,1526	129	CP1PAZ	E5,1620	123	JPARM	E5,1710	126	RTNAPSE
E5,1416	122	ABPFG	E5,1460	128	CALCDIR	E5,1527	123	LRVF	E5,1620	123	R60VSAVE	E5,1710	126	RTNLAMB
E5,1416	128	POSITION	E5,1460	129	FILOSLV	E5,1530	123	LRWVZ	E5,1620	123	VB1AS	E5,1710	126	RTNTR
E5,1416	821	ADG	E5,1461	128	CDUFLAG	E5,1530	129	ALTIM	E5,1622	123	KPARM	E5,1710	126	RTNTT
E5,1417	128	QPLAGE	E5,1462	122	AAPEFG*	E5,1531	123	LRWVY	E5,1624	123	RP	E5,1711	126	U2
E5,1420	128	QPLACES	E5,1462	128	GYTCRETQ	E5,1531	129	ALTIMS	E5,1626	123	RGL	E5,1711	127	GFF2SVG
E5,1421	128	SOLTHDR	E5,1462	129	INTVCS	E5,1532	123	LRWVX	E5,1634	123	CLAND	E5,1712	124	LANCALT
E5,1424	122	VBRFG*	E5,1462	129	VLAUN	E5,1532	129	ALDK	E5,1634	123	CLANCX	E5,1712	127	CMEGAN1
E5,1424	821	VDG2TTF	E5,1463	128	CP1NSEG	E5,1533	123	LRWVFX	E5,1636	123	DLANDY	E5,1714	124	CCLT
E5,1426	122	ABPFG*	E5,1464	122	JAPFG*	E5,1534	123	LPWVFY	E5,1640	123	CLANZ	E5,1714	124	VSUN
E5,1426	821	ATG2TTF	E5,1464	128	SAVE	E5,1534	128	MAKREG	E5,1642	122	ENDW	E5,1714	125	YSCI
E5,1430	122	JBRFG*	E5,1464	129	WPLATC	E5,1535	123	LRWVFX	E5,1642	124	XSM	E5,1714	125	ZSCI
E5,1430	128	TEMPTIME	E5,1466	122	GAINAPPR	E5,1536	123	LRWVFF	E5,1642	126	DELX	E5,1717	126	MAGVEC2
E5,1430	821	JDG2TTF	E5,1467	128	SFCNST1	E5,1536	128	CDUNDX	E5,1642	127	Z1	E5,1717	126	R2
E5,1432	122	GAINBPAK	E5,1470	122	TCGFAPPR	E5,1537	123	REDSOALE	E5,1644	124	-CCSB	E5,1720	127	CMEGAN2
E5,1432	128	TMBARK	E5,1470	128	TIMER	E5,1537	128	RESULCT	E5,1644	126	DELT	E5,1721	126	UR1
E5,1434	122	TCGFBRBK	E5,1470	129	INTY	E5,1540	123	TAUROD	E5,1646	124	SINB	E5,1722	124	VCCA
E5,1434	128	CDUTIMEI	E5,1471	122	TCGIAPPR	E5,1542	123	LAG/TAU	E5,1646	126	URFECT	E5,1726	127	CMEGAN3
E5,1434	128	GENFL	E5,1472	122	VIGN	E5,1542	126	CONATPL	E5,1650	124	YSM	E5,1727	126	SNTF
E5,1434	128	RDSP	E5,1472	128	DATAFL	E5,1543	128	CDUANG	E5,1654	126	RVEC	E5,1730	124	STAR
E5,1434	129	AINLA	E5,1472	129	ANGZ	E5,1544	123	MINFPCPE	E5,1654	126	RIVFC	E5,1730	125	SAX
E5,1434	129	WANGO	E5,1474	122	RIGNX	E5,1546	123	MAXFORCE	E5,1656	124	ZSM	E5,1731	126	CSTF
E5,1435	122	TCGIBRAK	E5,1474	129	INTZ	E5,1550	123	J1FARM	E5,1662	126	R2VEC	E5,1733	126	1-CSTF

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DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
E5,1734	127	HOLDW	E6,1410	130	LMKACSN	E6,1456	131	FLAST	E6,1532	134	1JACCR	E6,1641	127	DELCCCL1
E5,1735	126	CSTH-RHO	E6,1411	130	OKOR	E6,1457	131	TCQR	E6,1533	134	1JACCU	E6,1642	135	DELCCCL2
E5,1736	124	CTCP	E6,1412	130	IGNACSG	E6,1460	131	GLDPMIN	E6,1534	134	1JACCV	E6,1642	137	CEMGAL2
E5,1737	124	OGC	E6,1413	130	IGNACSR	E6,1461	131	CLDGMIN	E6,1535	134	SKIPU	E6,1643	125	CEMGAPD
E5,1737	126	P	E6,1414	130	M11	E6,1462	131	SAVFHAND	E6,1536	134	SKIPV	E6,1644	135	CEMGACC
E5,1741	124	IGC	E6,1415	130	M21	E6,1464	121	PERRCR	E6,1537	134	ADSO	E6,1645	135	CEMGARC
E5,1741	126	R1A	E6,1416	130	M31	E6,1465	131	NXT6ADR	E6,1541	134	ACSR	E6,1646	135	MIS
E5,1743	124	MGC	E6,1417	130	M22	E6,1466	121	TENEXT	E6,1542	124	ACU	E6,1646	137	FCCUW
E5,1742	126	VVEC	E6,1420	130	M32	E6,1470	121	T6FURTHA	E6,1544	134	ACSV	E6,1646	127	FCDLWLSR
E5,1745	125	QMTN	E6,1421	130	CEMGAP	E6,1472	131	NEXTP	E6,1545	134	ACSTERN	E6,1646	137	VEC1
E5,1746	125	QMAJ	E6,1422	130	CEMGAG	E6,1473	131	NEXTU	E6,1546	124	ACSTERN	E6,1647	137	GCDLWLSR
E5,1747	125	OGCT	E6,1423	130	CEMGAR	E6,1474	131	NEXTV	E6,1547	135	ACCSW	E6,1650	127	KPCDLW
E5,1751	126	FCC	E6,1424	130	ALPHAQ	E6,1475	131	-2JFTLIM	E6,1547	135	BLCKCTCF	E6,1651	137	FLAGCCDW
E5,1753	126	PTNPRM	E6,1425	130	ALPHAR	E6,1476	131	-RATEDB	E6,1550	125	ACCSW	E6,1652	137	FLPALTNC
E5,1754	126	SCNRDOT	E6,1426	130	CEMGAL	E6,1476	131	TARGETDB	E6,1551	1495	1/ANETP	E6,1653	127	UNFC/2
E5,1755	125	RESTI	E6,1426	131	URATEDIF	E6,1477	132	RETJADE	E6,1553	1495	1/ACCSTP	E6,1654	137	VEC2
E5,1755	126	RCFSTPED	E6,1427	130	CEMGAV	E6,1500	132	SENSTYP	E6,1555	135	FLAT	E6,1661	137	UNWC/2
E5,1756	125	RESTJ	E6,1427	131	EDCTP	E6,1501	123	NEGLC	E6,1556	135	ZCNE3LIM	E6,1667	137	UNFV/2
E5,1756	127	TCPOS	E6,1427	131	VRATEDIF	E6,1502	135	ALLOCGTS	E6,1557	1495	PACCFULN	E6,1667	137	UNFVX/2
E5,1757	125	STARIND	E6,1427	134	EDCT	E6,1503	133	NEGLR	E6,1561	1495	PCE1	E6,1670	126	COF
E5,1757	126	DELCEP	E6,1430	130	TRAPEDP	E6,1504	123	KC	E6,1562	1495	PCE2	E6,1671	137	UNFVY/2
E5,1757	126	TRPLAMP	E6,1431	130	TRAPFDC	E6,1505	133	AXISCTP	E6,1563	1495	PCE4	E6,1672	127	UNFVZ/2
E5,1760	125	STAPSAV1	E6,1432	130	TRAPEDR	E6,1505	133	SAVESR	E6,1564	1495	PCE3	E6,1675	127	-CELCNR
E5,1761	126	CRFPEV	E6,1433	130	NPTRAPS	E6,1506	123	KRDAP	E6,1565	1495	PAXDIST	E6,1676	136	ECCU
E5,1761	126	TPREV	E6,1434	131	NCTRAP	E6,1507	133	ACCCCTC	E6,1567	135	1/ANET1	E6,1701	126	KSPNDX
E5,1763	126	FPSILONL	E6,1435	131	NPTRAPS	E6,1510	123	QACCCDT	E6,1570	135	1/ANET2	E6,1702	136	KCPNCX
E5,1764	127	TOVEL	E6,1436	131	EDCTC	E6,1511	133	ACCCDTR	E6,1572	125	1/ACCOAST	E6,1703	136	KV1
E5,1765	126	COGA	E6,1436	131	GRATEDIF	E6,1512	133	RACCCDT	E6,1575	125	ACCFCT21	E6,1703	136	K1
E5,1765	126	INDCP	E6,1437	131	EDCTR	E6,1513	132	DCWNTCRK	E6,1576	125	ACCFCT25	E6,1703	136	MF1SYM
E5,1766	125	STARSAV2	E6,1437	131	RRATEDIF	E6,1513	133	PCSTCRPK	E6,1601	125	FIRED3	E6,1703	136	KCDL
E5,1772	127	EGRESS	E6,1440	131	OLDXFCPP	E6,1514	133	NEGTCIKP	E6,1603	135	CCASTCB	E6,1703	136	P21
E5,1773	127	CRIGIN	E6,1441	131	CLDYFCRF	E6,1515	133	POSTORKL	E6,1605	135	AXISDIST	E6,1703	136	TMFI
E5,1773	127	P3OEXIT	E6,1442	131	CLDZFCRG	E6,1516	134	NEGTCRKU	E6,1627	135	CCEFFC	E6,1703	126	TMIS
E5,1774	125	TALIGN	E6,1443	131	CH3ITEMP	E6,1517	124	PCSTFRKV	E6,1630	135	CCEFFR	E6,1705	136	C21
E5,1774	125	FND-PS	E6,1444	131	STIKSENS	E6,1520	134	NEGTCRKV	E6,1631	125	COTROLER	E6,1706	136	NEXTIME
E5,1776	125	RTX1	E6,1445	131	TCP	E6,1521	134	NC.UJFTS	E6,1632	135	CGINTMR	E6,1707	136	C21
E5,1777	125	RTX2	E6,1446	131	DXERRR	E6,1522	134	NC.UJFTS	E6,1633	135	INCTS	E6,1707	136	TTMP
E6,1400	130	HIASCENT	E6,1450	131	OYFRCR	E6,1523	134	NC.VJFTS	E6,1634	125	RGINTMR	E6,1711	126	BIASTEMP
E6,1401	130	COLTIME	E6,1450	131	QERROR	E6,1524	134	TJP	E6,1635	135	COLXC	E6,1711	126	C2SQP
E6,1402	130	PITTIME	E6,1451	133	QIFF	E6,1525	134	TJU	E6,1635	127	DCU	E6,1711	134	KV2
E6,1403	130	DKTRAP	E6,1452	131	OZFERRR	E6,1525	135	TJFTU	E6,1636	135	COLYD	E6,1711	136	K2
E6,1404	130	CKMEGAN	E6,1452	131	RERRR	E6,1526	134	TJV	E6,1637	135	COLZC	E6,1713	136	C2SQM
E6,1405	130	DKKACSN	E6,1452	133	RLFF	E6,1527	134	L,PVT-CG	E6,1640	125	DELCDLX	E6,1715	126	C2FF
E6,1406	130	LMTRAP	E6,1454	131	PLAST	E6,1530	134	1JACC	E6,1640	127	DELCCCU	E6,1717	136	C2MP
E6,1407	130	LMCEMGAN	E6,1455	131	QLAST	E6,1531	134	1JACCQ	E6,1641	125	DELCCLY	E6,1717	136	KV3

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DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
E6,1717	136	K3	E6,1746	133	JCTRATEG	E7,1427	139	RPCRTIME	E7,1502	146	CMEGA	E7,1570	148	MASS1
E6,1717	136	QGF	E6,1746	133	SCPATCH	E7,1430	139	PPCRTQSW	E7,1505	142	VAPREC	E7,1570	150	1/DVC
E6,1721	136	C1PP	E6,1746	134	APCSOIF1	E7,1421	139	TAEWA	E7,1505	142	VFASS1	E7,1570	155	DVCNTR1
E6,1723	136	C1MP	E6,1746	138	CAFTREG2	E7,1423	140	DELVLVC	E7,1505	145	VPASS4	E7,1572	148	RIS
E6,1725	136	BRAF	E6,1747	133	HALFAPG	E7,1433	140	DELVSLV	E7,1507	148	CVTOTAL	E7,1573	142	DELVC51
E6,1725	136	CCFSKFW	E6,1747	133	JCTRATER	E7,1441	140	TIG	E7,1511	148	GC8LTME	E7,1573	142	SECMAK
E6,1725	136	IG	E6,1747	134	HH	E7,1443	140	PTARG	E7,1513	142	VACT2	E7,1573	142	TDEC2
E6,1725	137	VECATEMP	E6,1747	138	DAPTRFG3	E7,1443	141	ZEPLINA	E7,1513	148	AFIVCCNV	E7,1573	150	TFIPCLD
E6,1733	136	CAM	E6,1750	132	CPSBURN	E7,1444	141	ELVTRA	E7,1515	148	DVCNTR	E7,1575	142	DELEL
E6,1733	136	TM	E6,1750	133	QRCNTR	E7,1445	141	AZINCR1	E7,1516	148	TCC	E7,1575	142	CFLVNIC
E6,1735	136	AM	E6,1750	138	DAPTRFG4	E7,1446	141	ELINCR1	E7,1520	148	P	E7,1575	142	CFLVTP1
E6,1737	131	TEMP31	E6,1751	132	USPPCR	E7,1451	140	CELLT4	E7,1520	148	UNITGC8L	E7,1575	142	CVPREV
E6,1737	132	ABSEDQTP	E6,1751	133	FUNCTION	E7,1453	140	TFI	E7,1521	142	FEASS2	E7,1575	142	KT
E6,1737	132	ABSTJ	E6,1751	138	DAPTRFG5	E7,1453	140	TTOGO	E7,1521	142	PFPRFC	E7,1577	142	C1FFALT
E6,1737	132	PCTEMP1	E6,1752	132	VERRCR	E7,1455	140	WHICH	E7,1524	146	BVECTCR	E7,1600	148	VIS
E6,1737	133	CSTTEMPS	E6,1752	134	F	E7,1456	140	LCSCCUNT	E7,1526	148	CCLVREF	E7,1601	142	POSTCSI
E6,1737	133	K2THETA	E6,1752	138	DAPTRFG6	E7,1457	140	AIG	E7,1526	148	V	E7,1603	142	FAFFA1
E6,1737	134	EDTSG	E6,1753	138	CAPARLET	E7,1460	140	AMG	E7,1527	142	VPASS2	E7,1603	142	FCSTCC
E6,1737	138	CAPTEMP1	E6,1754	138	DAPLR1P1	E7,1461	140	ACG	E7,1527	142	VFFREC	E7,1605	142	CLSTEED
E6,1740	132	PCTEMP2	E6,1755	138	DAPBGEFT	E7,1462	140	MARKCTR	E7,1534	148	HCALC	E7,1605	142	LCCFCT
E6,1740	134	ROTENSEF	E6,1757	138	DAPZPLPT	E7,1462	140	TRMKCNT	E7,1535	142	RACT3	E7,1605	142	POSTTP1
E6,1740	138	CAPTEMP2	E6,1761	138	AK	E7,1462	141	/AFC/	E7,1536	148	UNIT/R/	E7,1606	148	XSCREF
E6,1741	132	POLYTEMP	E6,1762	138	AK1	E7,1463	141	NORMFX	E7,1543	142	UNVEC	E7,1606	148	XSPD
E6,1741	133	KCENTRAL	E6,1763	138	AK2	E7,1464	141	CSAVED	E7,1543	142	VACT3	E7,1606	150	PIFSET
E6,1741	133	SFTEFLAG	E6,1764	138	EDRIVFX	E7,1465	141	FCDD	E7,1544	148	RN1	E7,1607	142	GAMFREV
E6,1741	134	FIRFEET	E6,1765	138	EDRIVEY	E7,1465	141	RTRN	E7,1544	150	LANDTEMP	E7,1607	143	INTIME
E6,1741	138	CAPTEMP3	E6,1766	138	EDRIVEZ	E7,1466	141	NN	E7,1544	150	CLFTEMPS	E7,1607	150	FTNFCLD
E6,1742	132	TEMPALM	E6,1767	138	PJETCTR	E7,1467	141	FP	E7,1546	146	DELTAQ	E7,1610	150	FWEIGHT
E6,1742	133	K2CENTRAL	E6,1771	138	UJETCTR	E7,1470	141	SUBEXIT	E7,1550	146	MARKCNT	E7,1611	142	CELDV
E6,1742	134	TTDAXIS	E6,1771	138	END-TE	E7,1471	141	E7QVFLA	E7,1551	142	FEASS3	E7,1611	142	CELTEE
E6,1742	138	DAPTEMP4	E6,1771	138	VJETCTR	E7,1471	141	WCCARES	E7,1551	146	XYMARK	E7,1611	142	1STRT
E6,1743	132	NUMBER1	E7,1490	139	ATTIGINC	E7,1471	142	VACT1	E7,1552	146	MKEEX	E7,1611	143	X1INPLT
E6,1743	133	KCENTRAL	E7,1492	139	PTIGINC	E7,1471	145	RTARG1	E7,1552	148	VA1	E7,1612	150	FIF
E6,1743	138	CAPTEMP5	E7,1494	139	ACTAZ	E7,1471	146	TX789	E7,1552	150	TTF/RTMP	E7,1613	142	CSIALRM
E6,1744	132	ROTINCEX	E7,1412	139	ANTFL	E7,1471	148	ARVSL	E7,1553	146	PIANVEC	E7,1613	142	TITER
E6,1744	133	KCENTRAL	E7,1420	139	LRPMAX	E7,1473	120	RDOT	E7,1554	150	ELINCR	E7,1614	148	YSCREF
E6,1744	133	INTINDEX	E7,1421	139	LRWH	E7,1473	148	EDCTISF	E7,1556	150	AZINCR	E7,1614	148	YSMD
E6,1744	134	ACRSCIF2	E7,1422	139	ZCCMTIME	E7,1475	148	TTFD1SP	E7,1557	142	VPASS3	E7,1614	150	FSEUEC55
E6,1744	138	DAPTEMP6	E7,1423	139	TENDERAK	E7,1477	142	RAPREC	E7,1560	148	P1PTIME1	E7,1615	142	VERENCLN
E6,1745	133	DEL	E7,1423	140	REFPCONT	E7,1477	142	FEASS1	E7,1560	150	KEEP-2	E7,1615	150	FC
E6,1745	133	JCTRATE	E7,1424	139	TENDAPPR	E7,1477	146	GAMMA	E7,1561	146	TSIGHT	E7,1616	142	RECTV
E6,1745	134	HOLDQ	E7,1424	140	REFCSTM	E7,1477	148	SAVET-30	E7,1562	148	GDT1/2	E7,1616	143	1TCTR
E6,1745	138	DAPTRFG1	E7,1425	139	DELTTFAP	E7,1501	148	DELVCTL	E7,1562	150	TABLTTF	E7,1617	150	TTFROT
E6,1745	1499	CLDSEASF	E7,1426	139	LFACTIME	E7,1501	148	VGBODY	E7,1565	142	VACT4	E7,1620	142	CENTANG
E6,1746	133	A2CENTRAL	E7,1426	140	DELTAIM	E7,1501	829	TCC1	E7,1565	143	VTFRIME	E7,1620	150	ECOLD

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DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
E7,1621	150	D2DPS	E7,1654	150	HMFAS	E7,1700	146	E1	E7,1734	145	CMEGAC	4000	28	FFTAG12
E7,1621	150	CUPPERMS	E7,1655	143	DELVSIN	E7,1700	151	LATVEL	E7,1734	145	CMFGDISP	4000	28	FFTAG13
E7,1621	150	WCHPHOLD	E7,1655	144	IC	E7,1701	151	FCRVEL	E7,1735	147	RRSHAFT	4000	28	FFTAG2
E7,1622	143	FLVIMU	E7,1655	153	END-F7.5	E7,1702	146	E2	E7,1736	144	MCCT	4000	28	FFTAG3
E7,1622	148	ZSMC	E7,1656	150	VN2	E7,1702	151	TRAKLATV	E7,1736	145	NSRCHPAT	4000	28	FFTAG4
E7,1622	149	ZSCRF	E7,1656	151	GNLR	E7,1703	145	VXRCM	E7,1737	145	SAVLEMV	4000	28	FFTAG7
E7,1622	150	FILLFR	E7,1656	151	GNUV	E7,1703	145	P21BASEV	E7,1737	147	LRS22.1X	4000	28	FFTAG8
E7,1623	150	FLPASSO	E7,1656	151	LPACRET1	E7,1703	151	TRAKFWDV	E7,1740	144	TDFCAY	4000	28	FFTAG9
E7,1624	150	TRIP	E7,1660	149	LNOCHTM	E7,1704	146	E3	E7,1740	147	RPECPSIT	4000	28	RADAREFF
E7,1626	150	VGL	E7,1662	149	TRANSTM	E7,1704	146	VY	E7,1741	152	ALTBITS	4000	153	ENC-E7.2
E7,1630	143	TPASS4	E7,1663	143	DELVSAB	E7,1704	151	VFY	E7,1742	144	VFX	4060	155	LPRTBE
E7,1630	149	ENC-ALIC	E7,1663	143	VGDISP	E7,1705	152	VH	E7,1742	765	2VFXHUST	4101	1091	CCT60000
E7,1630	149	RSLRL	E7,1664	149	NCSMVFL	E7,1706	144	VG	E7,1743	152	RUNIT	4144	1362	VEREMASK
E7,1630	153	FND-F7.3	E7,1664	151	DELTAH	E7,1706	152	VVECT	E7,1744	144	IFFTURN1	4201	454	PINSLPBT
E7,1630	153	RCC	E7,1665	143	QTEVP1	E7,1711	145	LCSDSPD	E7,1745	147	R65CNTR	4242	210	V00N34
E7,1632	143	QTEMP	E7,1665	143	PGFXT	E7,1711	149	P21VFL	E7,1745	152	LASTLADW	4303	458	ENDBLFF
E7,1632	153	YCO	E7,1665	143	SAVQR52	E7,1711	152	ALTRATE	E7,1745	153	ENC-E7.0	4317	1065	FCURTFEN
E7,1633	143	TCSI	E7,1666	143	QOZY4	E7,1712	146	MZ	E7,1746	146	N45FLAG	4317	1065	CCT16
E7,1634	150	LAND	E7,1666	151	FLINEED	E7,1712	152	ALTSVE	E7,1746	147	RDCMSAV	4320	1087	CCT11
E7,1634	153	1/DOV1	E7,1666	151	FUNNYDSP	E7,1713	146	P21GAM	E7,1746	152	RCCCOUNT	4320	1091	NINE
E7,1635	143	TTD1	E7,1666	151	TPECES	E7,1714	144	RMAG	E7,1747	153	ENC-F7.1	4350	1002	FEANKMASK
E7,1636	149	LCCSM	E7,1667	151	LCCKANGL	E7,1714	152	LDCSAVE	E7,1750	147	RDCM	4350	1091	BANKMASK
E7,1636	153	1/DOV2	E7,1670	143	XXXALT	E7,1714	823	PIPCTRI	E7,1752	147	TANGAB	4350	1276	-MAXACRS
E7,1637	143	TTD10	E7,1670	151	FCLREFRM	E7,1715	149	F21ALT	E7,1754	147	MKTIME	4355	219	CCT20000
E7,1640	153	1/DOV3	E7,1670	151	LRLCTR	E7,1715	152	DT	E7,1756	147	RM	4355	1091	BIT13-14
E7,1641	143	RTIG	E7,1671	151	LRRCTR	E7,1716	144	MUASTFR	E7,1756	152	RDCSCALI	4355	1091	PRIC30
E7,1642	150	TTF/8	E7,1672	143	END-IN/M	E7,1716	152	CALTEATE	E7,1757	152	LASTTP1P	4356	463	R12-1
E7,1642	153	XRANGE	E7,1672	144	LT	E7,1717	145	LXVECT	E7,1760	147	FANGRECT	4357	1276	SEBITS
E7,1644	149	NEWVEL	E7,1672	145	ERACM	E7,1717	152	QAXIS	E7,1761	152	THISTP1P	4360	1091	CCT23
E7,1644	150	FLIDUMMY	E7,1672	151	LRMCTR	E7,1717	152	LXVF	E7,1762	144	TIESAVE	4361	272	OCT21
E7,1644	151	VCGVERT	E7,1673	151	LRSCTR	E7,1720	144	ML/A	E7,1762	147	P21T1MF	4361	382	CEC17
E7,1644	153	FNGOFFDT	E7,1674	145	IACCFEX	E7,1720	146	SCALSHFT	E7,1763	152	CLDPIPA	4361	885	17CMS
E7,1645	150	AZIDUMMY	E7,1674	151	STILBADH	E7,1721	146	RXZ	E7,1764	144	TICSAVFF	4362	782	ASTINDEX
E7,1645	153	VGVECT	E7,1675	145	PLMSRCH	E7,1722	144	RTMAG	E7,1764	147	SCAXIS	4362	1091	CCT25
E7,1646	150	ZERDUMMY	E7,1675	146	ISSET	E7,1723	146	ULC	E7,1764	152	CLDPIPAY	4362	1381	LP21
E7,1646	151	NIGNLOOP	E7,1675	146	LGRFT	E7,1724	144	RIC	E7,1765	152	CLCP1PAZ	4363	501	CCT00012
E7,1647	143	VTIG	E7,1675	146	RCPFT	E7,1725	120	ZAXIS1	E7,1766	144	MLSCALE	4363	1091	TEN
E7,1647	151	FLVDUMMY	E7,1675	149	P21BASEP	E7,1725	145	LVECT	E7,1766	152	CELVRCD	4512	467	ENDP1NRF
E7,1647	151	NGU10SUR	E7,1675	151	STILBADV	E7,1725	152	LH7P	E7,1772	147	PCINTVSM	4616	527	ENCFMCCF
E7,1647	151	WCHVPT	E7,1676	146	ED	E7,1731	146	SINTHETA	E7,1774	152	HCALC1	4733	1496	1/C2
E7,1650	150	LRADEPT	E7,1676	146	MX	E7,1732	144	SS	E7,1777	153	ENC-E7	4734	1087	LIMITS
E7,1651	150	VSELECT	E7,1676	151	LATVMETR	E7,1733	145	DATAGOOD	E7,1777	153	ENC-E7.4	4735	65	NEFC2E1T
E7,1652	149	NEWPOS	E7,1677	151	FCRMVETR	E7,1733	147	RFRUN	4000	28	FFTAG1	4735	67	NJETSE1T
E7,1652	150	HMFAS	E7,1700	144	VSPRTV	E7,1733	152	DELVS	4000	28	FFTAG10	4735	69	CRFT81T
E7,1653	153	TXD	E7,1700	144	VGTIG	E7,1734	144	F	4000	28	FFTAG11	4735	70	PCCFE1T

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DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
4735	72	MRKIDBIT	4740	65	MCCABIT	4742	132	PBIT	4746	66	RRABBIT	4750	1091	EIGHT
4735	73	DSKYFRIT	4740	67	RCDFLRIT	4742	1091	PRIC1	4746	68	NCURFBIT	4750	1275	SBIT4
4735	75	S32BIT1	4740	69	LCSCMBIT	4742	1275	SBIT110	4746	69	FINALEIT	4750	1409	CSFLYALT
4735	77	ITSARIT	4740	70	LLNABIT	4743	66	P25FLPIT	4746	71	ORPWFBIT	4751	66	FPEEFBIT
4735	78	PFQFLBIT	4740	72	RDSFFBIT	4743	69	IMFLPIT	4746	73	RINBREIT	4751	68	SLOFEBIT
4735	83	LPPYBIT	4740	74	NOTP3BIT	4743	71	READRBIT	4746	74	3AXISBIT	4751	70	CALC3BIT
4735	85	CDFSRBIT	4740	75	S32BIT3B	4743	71	RO4FLBIT	4746	76	REDFL8BIT	4751	71	VINTFBIT
4735	87	FULSES	4740	77	ASTARBIT	4743	72	MRKANBIT	4746	78	V37FLBIT	4751	73	MKCVBIT
4735	1091	NFGMAX	4740	79	CMCCABIT	4743	74	DMENFBIT	4746	79	ORCEFBIT	4751	75	SCLSSEIT
4735	1091	VLC4DCOD	4740	80	FLPCBIT	4743	77	RVSFBIT	4746	81	RTFLBIT	4751	76	NTARGBIT
4735	1275	SPIT15	4740	83	VXINRBIT	4743	81	LEFARBIT	4746	84	LFC32BIT	4751	78	VERIFBIT
4736	65	JSKCHBIT	4740	85	ANTENBIT	4743	84	XCRFLBIT	4746	86	LRFSRBIT	4751	81	MIDIFBIT
4736	67	DIFLEBIT	4740	87	OLPRCBIT	4743	86	ALTSCBIT	4746	88	LLIAGEF	4751	84	NC511BIT
4736	68	SRCHORBIT	4740	921	TTFSCALE	4743	87	XOVINHIT	4746	816	-AZBIT	4751	86	RRRSEIT
4736	70	GLOKFBIT	4740	1091	PRIC4	4743	1275	SBIT9	4746	1275	SBIT6	4751	88	ACCSOKAY
4736	72	PRICDRIT	4740	1275	SBIT12	4743	1295	SPSCCDE	4747	66	LCKCRBIT	4751	616	VLITE
4736	75	S32BIT2	4741	43	MINC5M	4744	66	IMUSFBIT	4747	68	TRACKBIT	4751	1091	FCLR
4736	77	MANUFBIT	4741	65	P21FLPIT	4744	67	VFLFLPIT	4747	69	AVFLBIT	4751	1275	S+4
4736	80	FLVFRIT	4741	69	STFRBIT	4744	69	XDELVRIT	4747	71	STATFBIT	4751	1275	SEIT3
4736	82	INTFLBIT	4741	70	NR29FRIT	4744	71	PRECRBIT	4747	73	MRP1BIT	4752	37	DFLAYNLM
4736	85	RFMGDRIT	4741	72	MWAI1BIT	4744	72	MRVANBIT	4747	74	ACFBSYST	4752	66	R10FLBIT
4736	87	USFCRJTS	4741	74	R77FLBIT	4744	74	ZOOMBIT	4747	76	AVEGFBIT	4752	68	GLESSEIT
4736	1091	HAIF	4741	77	SWANDBIT	4744	76	MLNFLBIT	4747	79	AFSESBIT	4752	70	CALC2BIT
4736	1091	PGS1/2	4741	79	LMCCNBIT	4744	77	V67FLBIT	4747	81	GLITBIT	4752	71	C6CR9BIT
4736	1091	SPIT10	4741	80	FLFI1BIT	4744	79	SURFFBIT	4747	84	RFADVBIT	4752	75	MLGVFBIT
4736	1275	SBIT14	4741	84	PSTH1BIT	4744	81	FLAFBIT	4747	86	LFALTEIT	4752	76	ALXFLBIT
4737	40	FIRTHFCT	4741	85	RFPCSBIT	4744	84	LRINHBIT	4747	88	CBSLECT2	4752	78	V82EMEIT
4737	65	MIDFLBIT	4741	87	ACC4CR2X	4744	86	LRVELBIT	4747	616	FLITE	4752	80	INITATEIT
4737	67	FPADEFBIT	4741	132	QR8BIT	4744	87	DRIFTBIT	4747	741	CCT20	4752	81	MICAVEIT
4737	68	ACMCCBIT	4741	1091	EPANK4	4744	1275	SBITP	4747	744	LSTLIN	4752	84	VFLSFBIT
4737	70	PEFSMBIT	4741	1091	RRIC2	4744	1321	IMUSEFLG	4747	816	+AZBIT	4752	86	ALTCMBIT
4737	72	KRMIDBIT	4741	1091	2K	4745	66	PADVZBIT	4747	1275	SBIT5	4752	88	AUTRATE2
4737	74	SNLFFBIT	4741	1275	SBIT11	4745	67	UPDATBIT	4747	1402	CALLGMBL	4752	738	BLANKDEX
4737	75	S22PIT3A	4742	66	FSPASBIT	4745	69	ETP1BIT	4750	66	NEEDLEBIT	4752	815	+FLBIT
4737	77	ICNFLBIT	4742	67	R61FLPIT	4745	71	CULTBIT	4750	69	RFRATEBIT	4752	1091	TWC
4737	79	NFWIBIT	4742	70	VFLACBIT	4745	73	PRCNVBIT	4750	71	INLYPBIT	4752	1275	S+2
4737	80	R7071BIT	4742	72	NWAI1BIT	4745	74	NGCNBIT	4750	73	NRLPTBIT	4752	1275	SBIT2
4737	82	AFSFLBIT	4742	74	RNGSCBIT	4745	78	IDLEFBIT	4750	75	NCFRNBIT	4752	1379	LF72
4737	85	PCDLOBIT	4742	76	GMBDRBIT	4745	79	INFINEIT	4750	78	UPLOCBIT	4753	66	CLDESBIT
4737	87	CSMLOCKD	4742	77	NCRMSBIT	4745	82	REINTBIT	4750	80	CCCAFBIT	4753	70	NCCCEIT
4737	219	CCT1000U	4742	79	FLUNCBIT	4745	84	VELDARIT	4750	84	RNGEDBIT	4753	71	DIMGBIT
4737	750	FEXTRA	4742	81	FLRCSPIT	4745	86	RCDLFRIT	4750	86	PRCATBIT	4753	73	XDSRBIT
4737	1091	PRIC10	4742	84	NOLPRPIT	4745	88	RHCSCALE	4750	88	CESELEBIT	4753	75	RENDEWBIT
4737	1091	QUARTFR	4742	85	DESIGEIT	4745	1088	SUPFR100	4750	233	QC10CC10	4753	77	ATTFLEBIT
4737	1275	SEIT13	4742	87	AORBITRAN	4745	1275	SBIT7	4750	821	TSCALINV	4753	78	TFFSWBIT

EPAS4ELE & EQUALS CROSS-REFERENCE TABLE SHOWING DEFINITION, PAGE OF DEFINITION, AND SYMBOL

DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
4753	80	360SWBIT	5006	923	VBCENCS	6474	1091	CCT30002	04,3543	1382	UPFART3	05,2407	194	AGSLIST
4753	81	AVEMDRIT	5007	224	STARTEB	6744	1017	Q+2	04,3672	1384	UPCUT	05,2407	194	UPCMLIST
4753	85	EFLSHBIT	5007	1091	EBANK3	6745	1284	TOC	04,3673	1381	LFCUT4	05,2407	205	LMAGS10L
4753	86	TURNONBT	5007	1276	FRASCON6	7666	1091	CCT11001	05,2000	29	ABCRST1	05,3771	1237	2/3
4753	88	ALTPATE1	5007	1419	CGIMRITS	7715	554	BIT12,14	05,2000	29	ASENT3	06,2000	25	EARTHLOC
4753	210	LAGSLIST	5011	37	FRASID	7721	1431	25/32	05,2000	29	CCWNTFLM	06,2000	29	IMUCCP
4753	816	-ELBIT	5012	1276	SICRITS	7725	1091	B12T14	05,2000	29	EPHEM1	06,2000	29	NIDCGIM
4753	1091	CNF	5014	598	AR298RDR	7732	156	100MRUPT	05,2000	29	FPANDRES	06,2000	29	RCSMONT
4753	1275	S+1	5014	1423	BITS9,11	7732	1403	MS100	05,2000	29	CREITAL3	06,2000	29	T4RLP
4753	1275	SP1T1	5015	1091	EBANK6	7734	160	20MRUPT	05,2066	195	LMCRBMOL	06,2703	181	10CLFALL
4753	1375	LB71	5020	500	BITSFT	7743	534	-45DEGSR	05,2127	197	LMCSTA01	06,2703	181	1MLFAIL
4753	1423	1/10SEC	5020	1276	SBANK3	7743	1362	PIANKASK	05,2127	199	LAFEND01	06,3140	188	ENDRRMON
4753	1436	1/10S	5020	1419	RGIMRITS	7744	530	-BIT12	05,2127	203	LMLSAL01	06,3140	189	DAPT4S
4754	1276	S-ZERO	5024	1290	OC114000	7744	587	MINEL2	05,2136	197	LMCSTA02	06,3164	152	RCSMONT
4755	236	ENLADP00	5025	182	OC115000	7750	1276	S-2	05,2136	199	LMRENDQ2	06,3250	193	SFAILTAE
4755	1275	S+ZERO	5026	182	33RDMSK	7751	1276	S-2	05,2136	201	LMCSASC2	06,3260	193	EFAILTAB
4755	1379	UP7C	5026	224	IM23INIT	7751	1298	MINLS2	05,2136	203	LMLSAL02	07,2000	29	ACTMARK1
4756	224	NLMGPPS	5155	1374	OCALAFM	7752	1091	MINLS1	05,2136	205	LMAGSIC2	07,2000	29	ASENT2
4756	1275	S+5	5270	182	GLCKCKK	7752	1091	NEG1	05,2145	197	LMCSTA03	07,2000	29	MODESV
4756	1381	LPDTPFAS	5270	190	ENDCAPT4	7752	1276	S-1	05,2145	199	LMREND03	07,2667	844	SETXFLAG
4757	446	DSPMSK	5270	191	RCSMONTX	00,2000	28	PLAYJOB	05,2145	201	LMCSASC3	07,3202	1321	IMLFIN20
4757	1091	LOW3	5464	1363	LINLS	01,2000	28	LCACDAP1	05,2145	203	LMLSAL03	07,3704	1320	CPTSTALL
4757	1276	S+7	5472	263	ENDGXTVB	01,2000	28	RESTART	05,2145	205	LMAGS103	10,2000	29	CISPLAYS
4757	1364	OC17	5472	263	TERMGXTV	01,2000	239	PROTTAB	05,2154	197	LMCSTA04	10,2000	29	FLESHLOC
4760	737	VB99PFX	5472	1362	ENDGXT	01,2001	239	CADRTAB	05,2154	200	LMREND04	10,2000	29	PHASETAB
4760	1091	ACUTCFN	5634	1374	ARCFT	01,2016	239	2.2SPOT	05,2154	201	LMCSASC4	10,2000	29	RTECCCES
4761	1065	TH1PTCFN	5650	233	NFG7	01,2016	240	3.2SPOT	05,2154	203	LMLSAL04	10,2000	29	SLECTML
4762	737	CNTCNDEX	5650	1276	S-7	01,2016	243	6.2SPOT	05,2154	205	LMAGS104	10,2330	1362	GCXCSF
4764	1088	DEC27	5741	182	120MS	01,2337	257	V50N48	05,2157	197	LMCSTAC5	10,2334	1362	GCXCSF
4765	737	VB97DEX	5741	1321	BITS364	01,2517	1086	SW/	05,2157	200	LMREND05	10,2350	1362	GCXDSFR
4765	1088	DEC29	5741	1474	TWCLVE	04,2000	28	ACTMARK2	05,2157	201	LMCSAS05	10,2352	1362	CCXDSFFR
4766	280	250MS+1	6000	28	FETAG5	04,2000	28	CCNICS1	05,2157	203	LMLSAL05	10,3051	1362	GOAGIN
4766	1501	PATFLIM1	6000	28	FETAG6	04,2000	28	E/PRCG	05,2157	205	LMAGS105	10,3071	1362	GCPLAY
4767	1501	PATFDB1	6001	741	?	04,2000	28	KEYKLP1	05,2170	201	LMCSASC6	11,2000	29	F20CPS+11
4771	305	MINXON	6010	210	V00N25	04,2000	28	FINELLL4	05,2170	203	LMLSAL06	11,2000	29	INTVEL
4771	1276	CNTRCCN	6077	1298	OC1177	04,2000	28	R02	05,2172	194	NCPDLST	11,2000	29	CRBITAL
4771	1321	PITS486	6112	1091	VLCAD*	04,2000	28	R36LM	05,2172	197	LMCSTADL	12,2000	29	CN1CS
4771	1423	40CYC	6115	1276	S-4	04,2000	28	LFDAT2	05,2224	200	LMREND06	12,2000	30	JATPRET2
4771	1436	40CYCL	6245	1091	SIX	04,2000	28	VERB37	05,2224	202	LMCSAS06	12,2000	30	CREITAL1
4774	1325	OC162	6245	1275	S+6	04,2040	449	MCDRCUTE	05,2224	203	LMLSAL08	12,2000	37	LOCNITZ
4775	1091	OC1120	6250	567	RIN3	04,3022	37	LCDF174	05,2226	203	LMLSAL09	12,2002	37	LOCNITY
4776	1091	OC1140	6250	1091	LCW2	04,3023	1177	8EF16	05,2232	199	LMREND07	12,2004	37	LCDFALF
4776	1436	60MS	6250	1091	THPFE	04,3027	1177	EEF22	05,2276	203	LMLSAL07	12,2004	37	LOCNITX
4777	302	1SECF	6250	1275	S+3	04,3262	1279	LPPART2	05,2303	201	LMCSAS07	12,2004	1093	FALFCF
4777	756	SFC01	6250	1379	LF73	04,3501	1381	UPSTCRF	05,2357	203	LMLSAL09	12,2004	1128	DF1/2

FRASABLE & EQUALS CROSS-REFERENCE TABLE SHOWING DEFINITION, PAGE OF DEFINITION, AND SYMECL

DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL	DEF	PAGE	SYMBOL
12,2004	1140	L31	17,3136	1426	14Y5	23,2515	37	AP1AP2	30,2000	34	FLCGSLB	36,2107	741	SERVACDR
12,2006	37	LC6ZFRQS	20,2000	31	DAPS3	23,2515	37	THISAXIS	30,2000	34	LCWUPER	36,2150	725	P12SPCT
12,2006	1193	ZERFCDP	20,2000	31	LDAPCDP	23,2517	37	HIUNIT	30,2000	34	P12	36,2150	725	F42SPCT
12,2006	1129	20ZFRQ	21,2000	31	DAPS4	23,2521	37	HIDPHALF	30,2000	34	VR67A	36,2153	725	PE3SPCT
12,2006	1177	KEPZERO	21,2000	31	R10	23,2521	37	HILNITX	30,3007	850	T2A	36,3003	737	V99RECYC
12,2006	1237	DPZERC	21,2000	31	P11	23,2521	596	COS6ODEG	30,3754	918	DAZMAX	37,2000	36	INLSUFER
12,2017	37	RMM	22,2000	32	KALCMON1	23,2521	1092	DHPALF	30,3756	918	DELFR1M	37,2000	36	1MU2
12,2017	1193	LDPCSMAX	22,2000	32	KALCMON2	23,2523	37	H16ZFRCS	31,2000	34	FTRCT	37,2000	36	1NU4
12,2021	37	RME	22,2000	32	LANCONST	23,2523	596	ZERC/SP	31,2000	34	F2CPS*31	37,2000	36	PC5PC6
12,3765	1237	DQUARTER	22,2000	32	RENDEFZ	23,2523	1145	ZERCC	31,2000	34	VE67	37,2000	36	R21
12,3765	1237	PCS174	22,2000	32	R30LCC	23,2523	1273	TFFZEROS	31,2442	807	ENCLLJCB	37,2000	36	SERV1
12,2000	30	ABTFLCS	22,2000	32	SFRV2	24,2000	32	PLANT3	32,2070	34	ABCRIS	37,3541	555	PIPSRINE
13,2000	30	INTINIT	22,2744	365	LOC SKIRT	24,2000	32	P205	32,2000	34	F2CPS*32	40,2000	36	PINEALL1
13,2000	30	LATLNG	22,3541	37	DELRSPL	24,2000	494	PROG22	32,2000	34	LR522	40,2000	36	PINSLUFER
13,2000	30	LFMGFCM	22,3541	718	SPLRST	25,2000	32	PLANTIN3	32,2000	34	P2FS4	40,2000	36	R21LCC
13,2000	30	ORBITAL2	22,3707	856	CUTGRAVE	25,2000	32	P2051	32,2000	34	PEELCC	40,2000	36	SELFUFER
13,2000	30	P76LCC	23,2000	32	APCFER1	25,2000	32	P2052	32,2000	34	R47	40,3356	445	FNDECEL
13,3662	37	ATPDTH	23,2000	32	ASENT7	25,2000	32	RADARPT	32,2000	34	SFFV	40,3550	452	ENCRELS
13,2735	37	ACFPHIS	23,2000	32	EXTVB1	25,2000	32	RRLEADIN	33,2000	34	ASENT6	40,3577	455	FNDESEL1
13,2750	37	MOVATHIS	23,2000	32	INFLIGHT	25,2000	32	R29S1	33,2000	34	R29/SERV	40,3577	1284	OSPMMLCB
13,3044	37	QTHPREC	23,2000	32	INTPRET1	26,2000	33	BAWLANGS	33,2000	34	SFFVICES	40,3737	473	ENDPINS1
13,3060	37	THISPREC	23,2000	32	MFASINC	26,2000	33	MANUVER	33,2105	850	10CC5	41,2000	36	P1NALL2
14,2000	31	ASENT4	23,2000	32	MFASINC1	26,2000	33	MANUVEP1	33,2456	882	ENVCAT	41,2622	418	ENDRCTL
14,2000	31	P50S1	23,2000	32	NORMLTZ	26,2000	33	PLANTIN1	34,2000	34	ASCFLIT	41,3236	433	ENDRUTIN
14,2000	31	STAP1A	23,2000	32	PCWFLITE	26,2000	33	PLANTIN2	34,2000	34	ASENT8	41,3743	471	ENDPINS2
14,2500	928	S50	23,2000	32	PDWFLIT1	26,2000	33	P2053	34,2000	34	CS1/CDH1	42,2000	36	PINEALL3
14,2603	936	P56	23,2000	32	P12A	27,2000	33	ASENT1	34,2000	34	F2CPS*34	42,2000	36	SEANC
14,3250	938	P54	23,2000	32	RCOTRAP	27,2000	33	P40S1	34,2000	34	P2CS1	42,3606	438	ENDFMSS
15,2000	31	EPHEM	23,2000	32	R61	27,2000	33	SERV3	34,2000	34	R12STUFF	43,2000	36	EXTVERPS
15,2000	31	P50S	23,2000	32	P62	27,2000	33	TCF=FF	34,2000	34	SERV4	43,2000	36	SELFCHEC
15,2465	251	DP1/12	23,2103	487	R62DISP	27,2000	33	TCF=FF1	35,2000	35	CS1/CDH	43,2002	468	PINTEST
15,3647	977	LUNPOS	23,2237	1273	PPAC1	27,2000	33	VFCPT	35,2000	35	P2CS	43,2227	269	CPTCCAPV
16,2000	31	DAPS1	23,2513	37	HIDP1/4	27,3753	1272	TCOANZIG	35,2000	35	P4CS2	43,2357	272	VSCN66
16,3576	1430	INDXYZ	23,2513	501	GNEB-2	30,2000	34	ASENT	35,2000	35	P40S3	43,3062	289	V74
17,2000	31	C13RANK	23,2513	1273	TFF1/4	30,2000	34	ASENT5	36,2000	36	P40S	43,3115	291	CCTFCSUM
17,2000	31	DAPS2	23,2515	37	HILNITZ	30,2000	34	FCOLW	36,2057	756	ACADN85	43,3761	1378	CKMDVCRE
17,2710	1442	ATTSTEER												

SUMMARY OF SYMBOL TABLE LISTINGS

4920 DEFINED NORMALLY

2196 DEFINED BY EQUALS

TOTAL: 7116

MEMORY TYPE & AVAILABILITY DISPLAY

0000 TO	0057	SPECIAL OR NON-EXISTENT MEMORY	26,2000 TO	27,3774	RESERVED SWITCHABLE FIXED MEMORY
	0060	AVAILABLE ERASABLE MEMORY	27,3775 TO	27,3777	AVAILABLE SWITCHABLE FIXED MEMORY
0061 TO	1377	RESERVED ERASABLE MEMORY	30,2000 TO	30,3764	RESERVED SWITCHABLE FIXED MEMORY
E3,1400 TO	E5,1641	RESERVED SWITCHABLE ERASABLE MEMORY	30,3765 TO	30,3777	AVAILABLE SWITCHABLE FIXED MEMORY
E5,1642 TO	E5,1777	AVAILABLE SWITCHABLE ERASABLE MEMORY	31,2000 TO	31,2743	RESERVED SWITCHABLE FIXED MEMORY
E6,1400 TO	F6,1771	RESERVED SWITCHABLE ERASABLE MEMORY	31,3744 TO	31,3777	AVAILABLE SWITCHABLE FIXED MEMORY
E6,1772 TO	F6,1777	AVAILABLE SWITCHABLE ERASABLE MEMORY	32,2000 TO	32,2766	RESERVED SWITCHABLE FIXED MEMORY
E7,1400 TO	E7,1744	RESERVED SWITCHABLE ERASABLE MEMORY	32,3767 TO	32,3777	AVAILABLE SWITCHABLE FIXED MEMORY
E7,1745 TO	E7,1777	AVAILABLE SWITCHABLE ERASABLE MEMORY	32,2000 TO	33,2764	RESERVED SWITCHABLE FIXED MEMORY
			32,3765 TO	33,3777	AVAILABLE SWITCHABLE FIXED MEMORY
4000 TO	5767	RESERVED FIXED MEMORY	34,2000 TO	34,3652	RESERVED SWITCHABLE FIXED MEMORY
5770 TO	5777	AVAILABLE FIXED MEMORY	34,3653 TO	34,3777	AVAILABLE SWITCHABLE FIXED MEMORY
6000 TO	7763	RESERVED FIXED MEMORY	35,2000 TO	35,3740	RESERVED SWITCHABLE FIXED MEMORY
7764 TO	7777	AVAILABLE FIXED MEMORY	35,3741 TO	35,3777	AVAILABLE SWITCHABLE FIXED MEMORY
00,2000 TO	01,3777	RESERVED SWITCHABLE FIXED MEMORY	36,2000 TO	36,3773	RESERVED SWITCHABLE FIXED MEMORY
02,2000 TO	03,3777	SPECIAL OR NON-EXISTENT MEMORY	36,3774 TO	36,3777	AVAILABLE SWITCHABLE FIXED MEMORY
04,2000 TO	04,3754	RESERVED SWITCHABLE FIXED MEMORY	37,2000 TO	37,3773	RESERVED SWITCHABLE FIXED MEMORY
04,3755 TO	04,3777	AVAILABLE SWITCHABLE FIXED MEMORY	37,3774 TO	37,3777	AVAILABLE SWITCHABLE FIXED MEMORY
05,2000 TO	05,3776	RESERVED SWITCHABLE FIXED MEMORY	40,2000 TO	40,3760	RESERVED SWITCHABLE FIXED MEMORY
	05,3777	AVAILABLE SWITCHABLE FIXED MEMORY	40,3761 TO	40,3777	AVAILABLE SWITCHABLE FIXED MEMORY
06,2000 TO	06,3774	RESERVED SWITCHABLE FIXED MEMORY	41,2000 TO	41,2745	RESERVED SWITCHABLE FIXED MEMORY
06,3775 TO	06,3777	AVAILABLE SWITCHABLE FIXED MEMORY	41,3746 TO	41,3777	AVAILABLE SWITCHABLE FIXED MEMORY
07,2000 TO	07,3766	RESERVED SWITCHABLE FIXED MEMORY	42,2000 TO	42,2772	RESERVED SWITCHABLE FIXED MEMORY
07,3767 TO	07,3777	AVAILABLE SWITCHABLE FIXED MEMORY	42,3773 TO	42,3777	AVAILABLE SWITCHABLE FIXED MEMORY
10,2000 TO	11,3776	RESERVED SWITCHABLE FIXED MEMORY	42,2000 TO	43,3774	RESERVED SWITCHABLE FIXED MEMORY
	11,3777	AVAILABLE SWITCHABLE FIXED MEMORY	42,3775 TO	43,3777	AVAILABLE SWITCHABLE FIXED MEMORY
12,2000 TO	12,3775	RESERVED SWITCHABLE FIXED MEMORY	44,2000 TO	57,3777	SPECIAL OR NON-EXISTENT MEMORY
12,3776 TO	12,3777	AVAILABLE SWITCHABLE FIXED MEMORY	60,2000 TO	67,3777	AVAILABLE SWITCHABLE FIXED MEMORY
13,2000 TO	13,3764	RESERVED SWITCHABLE FIXED MEMORY	70,2000 TO	73,3777	SPECIAL OR NON-EXISTENT MEMORY
13,3765 TO	13,3777	AVAILABLE SWITCHABLE FIXED MEMORY			
14,2000 TO	15,3762	RESERVED SWITCHABLE FIXED MEMORY			
15,3763 TO	15,3777	AVAILABLE SWITCHABLE FIXED MEMORY			
16,2000 TO	21,3773	RESERVED SWITCHABLE FIXED MEMORY			
21,3774 TO	21,3777	AVAILABLE SWITCHABLE FIXED MEMORY			
22,2000 TO	22,3775	RESERVED SWITCHABLE FIXED MEMORY			
22,3776 TO	22,3777	AVAILABLE SWITCHABLE FIXED MEMORY			
23,2000 TO	23,3773	RESERVED SWITCHABLE FIXED MEMORY			
23,3774 TO	23,3777	AVAILABLE SWITCHABLE FIXED MEMORY			
24,2000 TO	25,3741	RESERVED SWITCHABLE FIXED MEMORY			
25,3742 TO	25,3777	AVAILABLE SWITCHABLE FIXED MEMORY			

ROUTINE: COUNT DATA FOR ROUTINE'S LAST REACH:TOTAL:CUMUL

ROUTINE: COUNT DATA FOR ROUTINE'S LAST REACH:TOTAL:CUMUL

BANKSUM	REF	1	LAST	28	TC	28:	0	0	0
00/DELAY	REF	1	LAST	28	TC	38:	63	63	63
00/INTER	REF	1	LAST	1367	TC	1369:	32	32	95
	REF	1	LAST	1039	TC	1079:	974	974	1069
01/EXEC	REF	1	LAST	1098	TC	1108:	280	280	1349
01/INTER	REF	1	LAST	1079	TC	1087:	157	157	1506
01/PSRCU	REF	3	LAST	1297	TC	1299:	55	166	1674
01/POSTAB	REF	1	LAST	239	TC	244:	135	135	1609
01/PO3	REF	2	LAST	295	TC	298:	92	94	1903
01/WAIT	REF	2	LAST	1123	TC	1125:	44	185	2052
02/ALARM	REF	2	LAST	1372	TC	1374:	79	108	2200
02/PANK	REF	1	LAST	590	TC	994:	76	76	2276
02/CAPT6	REF	1	LAST	1394	TC	1395:	18	18	2294
02/DSPLA	REF	1	LAST	1344	TC	1344:	16	16	2310
02/EXEC	REF	2	LAST	1108	TC	1111:	6	65	2375
02/EXTVB	REF	1	LAST	1370	TC	1371:	4	4	2379
02/FCCNS	REF	1	LAST	1087	TC	1089:	64	64	2443
02/FLAG	REF	1	LAST	1365	TC	1367:	32	32	2475
02/IMCCE	REF	1	LAST	1299	TC	1300:	5	5	2480
02/INTER	REF	1	LAST	1094	TC	1095:	32	32	2512
02/PHASE	REF	1	LAST	1288	TC	1290:	71	71	2583
02/PIN	REF	6	LAST	466	TC	469:	37	246	2829
02/P17	REF	1	LAST	382	TC	384:	18	18	2847
02/PSLR	REF	1	LAST	522	TC	528:	68	68	2915
02/RSPDU	REF	2	LAST	1296	TC	1297:	10	17	2932
02/RUPTS	REF	1	LAST	154	TC	156:	54	54	2986
02/TRAN	REF	1	LAST	1365	TC	1370:	15	15	3001
02/T4RPT	REF	1	LAST	156	TC	157:	12	12	3013
02/WAIT	REF	2	LAST	1121	TC	1123:	24	78	3091
03/DAP	REF	1	LAST	1449	TC	1451:	2	2	3093
03/FCCNS	REF	1	LAST	1089	TC	1092:	32	32	3125
03/INTER	REF	3	LAST	1096	TC	1139:	732	952	4077
03/KILL	REF	1	LAST	743	TC	743:	8	8	4085
03/PHASE	REF	1	LAST	1292	TC	1293:	4	4	4089
03/PDC	REF	1	LAST	225	TC	225:	8	8	4097
03/P20	REF	1	LAST	596	TC	598:	5	5	4102
03/P40	REF	1	LAST	40	TC	40:	1	1	4103
03/P24	REF	1	LAST	518	TC	518:	9	9	4112
04/CCNIC	REF	3	LAST	1178	TC	1181:	65	110	4222
04/INTIN	REF	1	LAST	1216	TC	1219:	54	54	4276

04/KFYLP	REF	1	LAST	1328	TC	1344:	68	68	4344
04/LT-LG	REF	1	LAST	45	TC	45:	4	4	4348
04/MARK	REF	1	LAST	249	TC	250:	32	32	4380
04/FIN	REF	2	LAST	466	TC	466:	7	16	4396
04/P00	REF	1	LAST	225	TC	236:	316	316	4712
04/P07	REF	2	LAST	373	TC	374:	5	32	4744
04/P27	REF	1	LAST	1379	TC	1387:	248	248	4952
04/P57	REF	1	LAST	975	TC	977:	12	12	5004
04/P02	REF	1	LAST	1322	TC	1325:	17	17	5021
04/R36	REF	1	LAST	701	TC	703:	93	93	5114
05/ASSENT	REF	1	LAST	845	TC	845:	2	2	5116
05/CLIST	REF	1	LAST	194	TC	207:	242	242	5256
05/DPRCG	REF	1	LAST	983	TC	990:	183	183	5541
05/EPHEM	REF	2	LAST	579	TC	583:	0	52	5553
05/P70	REF	1	LAST	824	TC	826:	56	56	5649
05/START	REF	2	LAST	212	TC	225:	473	474	6123
06/ICOMP	REF	1	LAST	327	TC	340:	262	262	6405
06/LLRCT	REF	1	LAST	1139	TC	1141:	9	9	6414
06/MIDG	REF	1	LAST	692	TC	693:	30	30	6444
06/T4FCS	REF	1	LAST	192	TC	194:	69	69	6513
06/T4RPT	REF	2	LAST	157	TC	192:	618	628	7141
07/ASSENT	REF	1	LAST	844	TC	845:	15	15	7156
07/IMCCE	REF	1	LAST	1300	TC	1322:	558	558	7714
07/MARK	REF	2	LAST	251	TC	261:	286	407	8121
07/R59	REF	1	LAST	261	TC	262:	32	32	8153
10/DSPLA	REF	3	LAST	1372	TC	1372:	9	678	8821
10/MIDG	REF	1	LAST	693	TC	695:	24	24	8855
10/PHASE	REF	2	LAST	1290	TC	1292:	66	75	8920
10/POWFL	REF	1	LAST	1255	TC	1261:	115	115	9045
10/RTB	REF	1	LAST	1387	TC	1394:	130	130	9175
11/F20PS	REF	1	LAST	814	TC	816:	66	66	9241
11/INITV	REF	1	LAST	666	TC	692:	194	194	9435
11/OPRIT	REF	1	LAST	1218	TC	1239:	830	830	10265
12/CCNIC	REF	3	LAST	1181	TC	1200:	502	986	11251
12/ICONS	REF	1	LAST	1093	TC	1094:	19	19	11270
13/ALARM	REF	1	LAST	1374	TC	1378:	10	10	11280
13/GEOM	REF	1	LAST	321	TC	325:	79	79	11355
13/INTIN	REF	4	LAST	1212	TC	1216:	134	603	11562
13/LT-LG	REF	1	LAST	1125	TC	1132:	155	155	12117
13/DRPRT	REF	1	LAST	46	TC	46:	20	20	12137

ROUTINE: COUNT DATA FOR ROUTINE'S LAST PEACH:TOTAL:CUMUL

13/P76	REF	1	LAST	709	TO	713:	58	58	12235
14/ASENT	REF	1	LAST	845	TO	847:	57	57	12292
14/INFLT	REF	1	LAST	941	TO	942:	0	0	12292
14/LCSAM	REF	2	LAST	928	TO	930:	67	75	12367

14/P51	REF	1	LAST	942	TO	946:	127	127	12494
14/R50	REF	1	LAST	940	TO	941:	64	64	12558
14/R51	REF	1	LAST	934	TO	938:	135	135	12692
14/R52	REF	1	LAST	948	TO	950:	68	68	12761

14/R54	REF	1	LAST	939	TO	940:	41	41	12802
14/R55	REF	1	LAST	938	TO	939:	26	26	12828
14/R56	REF	1	LAST	930	TO	934:	132	132	12960
14/STARS	REF	1	LAST	47	TO	51:	223	223	13183

14/S52.1	REF	1	LAST	946	TO	947:	25	25	13208
14/S52.3	REF	1	LAST	947	TO	948:	16	16	13224
15/APHFM	REF	1	LAST	977	TO	979:	73	73	13297
15/P51	REF	1	LAST	954	TO	957:	65	65	13362

15/R52	REF	1	LAST	920	TO	928:	157	157	13519
15/P57	REF	2	LAST	960	TO	975:	435	556	14075
15/R59	REF	2	LAST	950	TO	954:	149	189	14264
16/DAR	REF	1	LAST	1460	TO	1462:	60	60	14324

16/DAP1C	REF	1	LAST	1400	TO	1404:	139	139	14463
16/DAPF	REF	1	LAST	1411	TO	1432:	794	794	15257
17/DARQR	REF	1	LAST	1432	TO	1449:	624	624	15881
17/DAPTJ	REF	1	LAST	1451	TO	1460:	315	315	16196

17/DAPT6	REF	2	LAST	1395	TO	1396:	5	39	16235
20/DAPAC	REF	4	LAST	1487	TO	1498:	355	720	16955
20/DAPIF	REF	1	LAST	1396	TO	1400:	74	74	17025
20/AFEDL	REF	1	LAST	1404	TO	1411:	156	156	17185

20/P03	REF	1	LAST	293	TO	295:	73	73	17258
21/DAPAC	REF	1	LAST	1476	TO	1476:	8	8	17266
21/DAPBL	REF	1	LAST	1498	TO	1498:	82	82	17348
21/DAPET	REF	1	LAST	1462	TO	1476:	388	388	17736

21/P7C	REF	2	LAST	829	TO	829:	16	30	17766
21/R10	REF	2	LAST	851	TO	903:	467	473	18239
21/R11	REF	1	LAST	823	TO	824:	49	49	18288
21/SERV	REF	1	LAST	867	TO	868:	16	16	18304

22/P2ERS	REF	1	LAST	822	TO	823:	10	10	18314
22/INCCR	REF	1	LAST	1145	TO	1166:	50	50	18364
22/KALC	REF	1	LAST	352	TO	371:	670	670	19034
22/R30	REF	2	LAST	713	TO	720:	199	203	19237

ROUTINE: COUNT DATA FOR ROUTINE'S LAST REACH:TOTAL:CUMUL

22/SERV	REF	1	LAST	858	TO	860:	24	24	19261
22/SR30S	REF	1	LAST	720	TO	723:	62	62	19323
23/EXTVB	REF	1	LAST	271	TO	271:	33	33	19356
23/F2DPS	REF	1	LAST	816	TO	816:	6	6	19362

23/GFCM	REF	1	LAST	325	TO	327:	34	34	19396
23/ICMS	REF	1	LAST	1092	TO	1093:	16	16	19412
23/INCCR	REF	2	LAST	1145	TO	1145:	196	334	19746
23/INFLT	REF	1	LAST	1239	TO	1249:	184	184	19930

23/PERAR	REF	1	LAST	695	TO	701:	78	78	20008
23/ROWFL	REF	1	LAST	1249	TO	1255:	152	152	20160
23/R61	REF	1	LAST	519	TO	522:	145	145	20305
23/R62	REF	1	LAST	487	TO	488:	11	11	20316

23/SEPV	REF	1	LAST	861	TO	862:	24	24	20340
24/LPS2J	REF	1	LAST	569	TO	576:	46	46	20386
24/LURDT	REF	1	LAST	1133	TO	1136:	63	63	20449
24/P20	REF	2	LAST	457	TO	503:	226	256	20705

24/P21	REF	1	LAST	655	TO	661:	122	122	20827
24/R22	REF	2	LAST	509	TO	510:	5	5	20832
24/R25	REF	1	LAST	504	TO	506:	37	37	20869
24/R21	REF	1	LAST	510	TO	515:	161	161	21030

24/R22	REF	1	LAST	506	TO	509:	147	147	21177
24/R23	REF	1	LAST	515	TO	517:	41	41	21218
24/R24	REF	2	LAST	518	TO	519:	16	38	21256
24/R29	REF	2	LAST	608	TO	611:	69	87	21343

25/LPS20	REF	1	LAST	570	TO	573:	12	12	21355
25/LURCT	REF	1	LAST	1136	TO	1138:	68	68	21423
25/PLEAD	REF	1	LAST	492	TO	494:	56	56	21479
25/PRLPT	REF	3	LAST	615	TO	617:	33	273	21752

25/RSUB	REF	2	LAST	565	TO	569:	60	624	22276
26/BALL	REF	1	LAST	479	TO	483:	50	50	22426
26/LRS24	REF	1	LAST	561	TO	596:	172	172	22598
26/LSR22	REF	1	LAST	579	TO	591:	522	532	22130

26/LURDT	REF	3	LAST	1138	TO	1139:	26	65	23195
26/R06	REF	1	LAST	475	TO	479:	103	103	23298
26/R63	REF	1	LAST	340	TO	352:	65	65	23363
27/ASENT	REF	2	LAST	849	TO	850:	21	36	23399

27/KILL	REF	1	LAST	743	TO	746:	38	38	23437
27/R12	REF	1	LAST	44	TO	44:	4	4	23441
27/P40	REF	2	LAST	746	TO	748:	83	93	23534
27/P70	REF	1	LAST	39	TO	39:	8	8	23542

ROUTINE: COUNT DATA FOR ROUTINE'S LAST REACH: TOTAL: CUMUL

27/SERV	REF	1	LAST	860 TC	861:	31	31	23573
27/S4C.1	REF	1	LAST	758 TC	762:	101	101	23674
27/S4C.2	REF	1	LAST	762 TC	763:	28	28	23702
27/S4C.6	REF	1	LAST	774 TC	777:	40	40	23742
27/S4C.8	REF	1	LAST	763 TC	766:	57	57	23795
27/S4C.9	REF	2	LAST	769 TC	774:	200	202	24001
27/S41.1	REF	1	LAST	777 TC	778:	4	4	24005
27/TFF	REF	2	LAST	1261 TC	1275:	266	268	24273
27/VFCPT	REF	1	LAST	483 TC	487:	136	136	24409
27/40.13	REF	1	LAST	766 TC	769:	102	102	24512
30/ASENT	REF	2	LAST	838 TC	844:	312	314	24826
30/FXTVB	REF	1	LAST	612 TC	615:	47	47	24873
30/FCCW	REF	1	LAST	903 TC	920:	441	441	25314
30/P12	REF	1	LAST	831 TC	834:	156	156	25470
31/EXTVR	REF	1	LAST	611 TC	613:	93	93	25563
31/F2DFS	REF	4	LAST	816 TC	822:	135	687	26250
31/P13	REF	1	LAST	793 TC	795:	78	78	26328
31/THPCT	REF	2	LAST	786 TC	791:	130	135	26463
32/F2DPS	REF	2	LAST	810 TC	814:	179	180	26643
32/LRS22	REF	2	LAST	573 TC	579:	123	137	26780
32/P20	REF	1	LAST	495 TC	497:	103	103	26883
32/P63	REF	1	LAST	778 TC	784:	181	181	27064
32/P70	REF	2	LAST	829 TC	831:	24	138	27202
32/R25	REF	1	LAST	603 TC	608:	151	151	27353
32/R47	REF	1	LAST	207 TC	212:	138	138	27491
32/SERV	REF	1	LAST	861 TC	861:	3	3	27494
33/ASENT	REF	1	LAST	850 TC	852:	44	44	27538
33/R29	REF	1	LAST	596 TC	602:	97	97	27635
33/SERV	REF	8	LAST	887 TC	891:	88	913	28546
34/ASENT	REF	3	LAST	847 TC	849:	77	127	28675
34/GSI	REF	1	LAST	635 TC	653:	650	650	29225
34/P12	REF	1	LAST	834 TC	836:	23	23	29348

ROUTINE: COUNT DATA FOR ROUTINE'S LAST REACH: TOTAL: CUMUL

34/P6567	REF	1	LAST	784 TC	786:	42	42	29390
34/SERV	REF	2	LAST	887 TC	887:	14	47	29437
34/S305	REF	1	LAST	619 TC	624:	47	47	29484
35/P30	REF	1	LAST	617 TC	619:	28	28	29512
35/P3272	REF	1	LAST	624 TC	630:	119	119	29631
35/P3373	REF	1	LAST	630 TC	635:	140	140	29771
35/P3474	REF	1	LAST	661 TC	666:	112	112	29883
35/P3575	REF	2	LAST	666 TC	686:	529	543	30426
35/P40	REF	2	LAST	740 TC	741:	23	48	30474
36/P40	REF	6	LAST	752 TC	758:	163	782	31256
36/P41	REF	1	LAST	748 TC	750:	78	78	31334
36/P42	REF	1	LAST	750 TC	751:	22	22	31356
36/P47	REF	1	LAST	751 TC	752:	52	52	31408
37/P05	REF	1	LAST	1326 TC	1328:	32	32	31440
37/P06	REF	1	LAST	1325 TC	1326:	47	47	31487
37/P07	REF	3	LAST	364 TC	399:	267	587	32074
37/P31	REF	1	LAST	703 TC	709:	189	189	32263
37/SERV	REF	2	LAST	864 TC	867:	76	162	32425
40/EXTVB	REF	1	LAST	300 TC	305:	63	63	32488
40/PIN	REF	10	LAST	472 TC	475:	57	928	32416
40/P31	REF	1	LAST	703 TC	703:	15	15	32431
41/PIN	REF	8	LAST	469 TC	472:	82	595	32426
42/EXTVB	REF	2	LAST	288 TC	289:	23	38	32464
42/NOUNS	REF	1	LAST	305 TC	321:	597	597	35061
42/PIN	REF	2	LAST	436 TC	439:	52	238	35255
42/R05	REF	2	LAST	488 TC	492:	114	116	35415
42/R33	REF	1	LAST	276 TC	277:	27	27	35442
43/EXTVB	REF	6	LAST	298 TC	300:	60	505	35947
43/PHASE	REF	1	LAST	1284 TC	1284:	14	14	35961
43/P27	REF	1	LAST	1378 TC	1379:	21	21	35982
43/R0477	REF	1	LAST	277 TC	281:	178	178	36160
43/SELF	REF	1	LAST	1275 TC	1284:	314	314	36474

PARAGRAPHS GENERATED FOR THIS ASSEMBLY; ADDRESS LIMITS AND THE MANUFACTURING LOCATION CODE ARE SHOWN FOR EACH

4300	TC	4377	PARAGRAPH # 010	ROPE MODULE 1, SIDE A, SENSE LINE SET	5 (WIRES 65- 80)
4400	TC	4777	PARAGRAPH # 011	ROPE MODULE 1, SIDE B, SENSE LINE SET	5 (WIRES 65- 80)
5000	TD	5377	PARAGRAPH # 012	ROPE MODULE 1, SIDE A, SENSE LINE SET	6 (WIRES 81- 96)
5400	TC	5777	PARAGRAPH # 013	ROPE MODULE 1, SIDE B, SENSE LINE SET	6 (WIRES 81- 96)
6000	TC	6377	PARAGRAPH # 014	ROPE MODULE 1, SIDE A, SENSE LINE SET	7 (WIRES 97-112)
6400	TC	6777	PARAGRAPH # 015	ROPE MODULE 1, SIDE B, SENSE LINE SET	7 (WIRES 97-112)
7000	TC	7377	PARAGRAPH # 016	ROPE MODULE 1, SIDE A, SENSE LINE SET	8 (WIRES 113-128)
7400	TD	7777	PARAGRAPH # 017	ROPE MODULE 1, SIDE B, SENSE LINE SET	8 (WIRES 113-128)
00,2000	TC	00,2377	PARAGRAPH # 020	ROPE MODULE 1, SIDE A, SENSE LINE SET	1 (WIRES 1- 16)
00,2400	TC	00,2777	PARAGRAPH # 021	ROPE MODULE 1, SIDE B, SENSE LINE SET	1 (WIRES 1- 16)
00,3000	TC	00,3377	PARAGRAPH # 022	ROPE MODULE 1, SIDE A, SENSE LINE SET	2 (WIRES 17- 32)
00,3400	TC	00,3777	PARAGRAPH # 023	ROPE MODULE 1, SIDE B, SENSE LINE SET	2 (WIRES 17- 32)
01,2000	TC	01,2377	PARAGRAPH # 024	ROPE MODULE 1, SIDE A, SENSE LINE SET	3 (WIRES 33- 48)
01,2400	TC	01,2777	PARAGRAPH # 025	ROPE MODULE 1, SIDE B, SENSE LINE SET	3 (WIRES 33- 48)
01,3000	TC	01,3377	PARAGRAPH # 026	ROPE MODULE 1, SIDE A, SENSE LINE SET	4 (WIRES 49- 64)
01,3400	TC	01,3777	PARAGRAPH # 027	ROPE MODULE 1, SIDE B, SENSE LINE SET	4 (WIRES 49- 64)
04,2000	TC	04,2377	PARAGRAPH # 040	ROPE MODULE 1, SIDE A, SENSE LINE SET	9 (WIRES 129-144)
04,2400	TC	04,2777	PARAGRAPH # 041	ROPE MODULE 1, SIDE B, SENSE LINE SET	9 (WIRES 129-144)
04,3000	TC	04,3377	PARAGRAPH # 042	ROPE MODULE 1, SIDE A, SENSE LINE SET	10 (WIRES 145-160)
04,3400	TC	04,3777	PARAGRAPH # 043	ROPE MODULE 1, SIDE B, SENSE LINE SET	10 (WIRES 145-160)
05,2000	TC	05,2377	PARAGRAPH # 044	ROPE MODULE 1, SIDE A, SENSE LINE SET	11 (WIRES 161-176)
05,2400	TC	05,2777	PARAGRAPH # 045	ROPE MODULE 1, SIDE B, SENSE LINE SET	11 (WIRES 161-176)
05,3000	TC	05,3377	PARAGRAPH # 046	ROPE MODULE 1, SIDE A, SENSE LINE SET	12 (WIRES 177-192)
05,3400	TC	05,3777	PARAGRAPH # 047	ROPE MODULE 1, SIDE B, SENSE LINE SET	12 (WIRES 177-192)
06,2000	TC	06,2377	PARAGRAPH # 050	ROPE MODULE 2, SIDE A, SENSE LINE SET	1 (WIRES 1- 16)
06,2400	TC	06,2777	PARAGRAPH # 051	ROPE MODULE 2, SIDE B, SENSE LINE SET	1 (WIRES 1- 16)
06,3000	TC	06,3377	PARAGRAPH # 052	ROPE MODULE 2, SIDE A, SENSE LINE SET	2 (WIRES 17- 32)
06,3400	TC	06,3777	PARAGRAPH # 053	ROPE MODULE 2, SIDE B, SENSE LINE SET	2 (WIRES 17- 32)
07,2000	TC	07,2377	PARAGRAPH # 054	ROPE MODULE 2, SIDE A, SENSE LINE SET	3 (WIRES 33- 48)
07,2400	TC	07,2777	PARAGRAPH # 055	ROPE MODULE 2, SIDE B, SENSE LINE SET	3 (WIRES 33- 48)
07,3000	TC	07,3377	PARAGRAPH # 056	ROPE MODULE 2, SIDE A, SENSE LINE SET	4 (WIRES 49- 64)
07,3400	TD	07,3777	PARAGRAPH # 057	ROPE MODULE 2, SIDE B, SENSE LINE SET	4 (WIRES 49- 64)
10,2000	TC	10,2377	PARAGRAPH # 060	ROPE MODULE 2, SIDE A, SENSE LINE SET	5 (WIRES 65- 80)
10,2400	TC	10,2777	PARAGRAPH # 061	ROPE MODULE 2, SIDE B, SENSE LINE SET	5 (WIRES 65- 80)
10,3000	TC	10,3377	PARAGRAPH # 062	ROPE MODULE 2, SIDE A, SENSE LINE SET	6 (WIRES 81- 96)
10,3400	TC	10,3777	PARAGRAPH # 063	ROPE MODULE 2, SIDE B, SENSE LINE SET	6 (WIRES 81- 96)
11,2000	TC	11,2377	PARAGRAPH # 064	ROPE MODULE 2, SIDE A, SENSE LINE SET	7 (WIRES 97-112)
11,2400	TC	11,2777	PARAGRAPH # 065	ROPE MODULE 2, SIDE B, SENSE LINE SET	7 (WIRES 97-112)
11,3000	TC	11,3377	PARAGRAPH # 066	ROPE MODULE 2, SIDE A, SENSE LINE SET	8 (WIRES 113-128)
11,3400	TC	11,3777	PARAGRAPH # 067	ROPE MODULE 2, SIDE B, SENSE LINE SET	8 (WIRES 113-128)
12,2000	TC	12,2377	PARAGRAPH # 070	ROPE MODULE 2, SIDE A, SENSE LINE SET	9 (WIRES 129-144)
12,2400	TD	12,2777	PARAGRAPH # 071	ROPE MODULE 2, SIDE B, SENSE LINE SET	9 (WIRES 129-144)
12,3000	TC	12,3377	PARAGRAPH # 072	ROPE MODULE 2, SIDE A, SENSE LINE SET	10 (WIRES 145-160)

PARAGRAPHS GENERATED FOR THIS ASSEMBLY; ADDRESS LIMITS AND THE MANUFACTURING LOCATION CODE ARE SHOWN FOR EACH

12,3400	TC 12,3777	PARAGRAPH # 073	RCPE MODULE 2, SIDE B, SENSE LINE SET 10 (WIRES 145-160)
13,2000	TC 13,2377	PARAGRAPH # 074	RCPE MODULE 2, SIDE A, SENSE LINE SET 11 (WIRES 161-176)
13,2400	TC 13,2777	PARAGRAPH # 075	RCPE MODULE 2, SIDE B, SENSE LINE SET 11 (WIRES 161-176)
13,3000	TC 13,3377	PARAGRAPH # 076	RCPE MODULE 2, SIDE A, SENSE LINE SET 12 (WIRES 177-192)
13,3400	TC 13,3777	PARAGRAPH # 077	RCPE MODULE 2, SIDE B, SENSE LINE SET 12 (WIRES 177-192)
14,2000	TC 14,2377	PARAGRAPH # 100	RCPE MODULE 3, SIDE A, SENSE LINE SET 1 (WIRES 1-16)
14,2400	TC 14,2777	PARAGRAPH # 101	RCPE MODULE 3, SIDE B, SENSE LINE SET 1 (WIRES 1-16)
14,3000	TC 14,3377	PARAGRAPH # 102	RCPE MODULE 3, SIDE A, SENSE LINE SET 2 (WIRES 17-32)
14,3400	TC 14,3777	PARAGRAPH # 103	RCPE MODULE 3, SIDE B, SENSE LINE SET 2 (WIRES 17-32)
15,2000	TC 15,2377	PARAGRAPH # 104	RCPE MODULE 3, SIDE A, SENSE LINE SET 3 (WIRES 33-48)
15,2400	TC 15,2777	PARAGRAPH # 105	RCPE MODULE 3, SIDE B, SENSE LINE SET 3 (WIRES 33-48)
15,3000	TC 15,3377	PARAGRAPH # 106	RCPE MODULE 3, SIDE A, SENSE LINE SET 4 (WIRES 49-64)
15,3400	TC 15,3777	PARAGRAPH # 107	RCPE MODULE 3, SIDE B, SENSE LINE SET 4 (WIRES 49-64)
16,2000	TC 16,2377	PARAGRAPH # 110	RCPE MODULE 3, SIDE A, SENSE LINE SET 5 (WIRES 65-80)
16,2400	TC 16,2777	PARAGRAPH # 111	RCPE MODULE 3, SIDE B, SENSE LINE SET 5 (WIRES 65-80)
16,3000	TC 16,3377	PARAGRAPH # 112	RCPE MODULE 3, SIDE A, SENSE LINE SET 6 (WIRES 81-96)
16,3400	TC 16,3777	PARAGRAPH # 113	RCPE MODULE 3, SIDE B, SENSE LINE SET 6 (WIRES 81-96)
17,2000	TC 17,2377	PARAGRAPH # 114	RCPE MODULE 3, SIDE A, SENSE LINE SET 7 (WIRES 97-112)
17,2400	TC 17,2777	PARAGRAPH # 115	RCPE MODULE 3, SIDE B, SENSE LINE SET 7 (WIRES 97-112)
17,3000	TC 17,3377	PARAGRAPH # 116	RCPE MODULE 3, SIDE A, SENSE LINE SET 8 (WIRES 113-128)
17,3400	TC 17,3777	PARAGRAPH # 117	RCPE MODULE 3, SIDE B, SENSE LINE SET 8 (WIRES 113-128)
20,2000	TC 20,2377	PARAGRAPH # 120	RCPE MODULE 3, SIDE A, SENSE LINE SET 9 (WIRES 129-144)
20,2400	TC 20,2777	PARAGRAPH # 121	RCPE MODULE 3, SIDE B, SENSE LINE SET 9 (WIRES 129-144)
20,3000	TC 20,3377	PARAGRAPH # 122	RCPE MODULE 3, SIDE A, SENSE LINE SET 10 (WIRES 145-160)
20,3400	TC 20,3777	PARAGRAPH # 123	RCPE MODULE 3, SIDE B, SENSE LINE SET 10 (WIRES 145-160)
21,2000	TC 21,2377	PARAGRAPH # 124	RCPE MODULE 3, SIDE A, SENSE LINE SET 11 (WIRES 161-176)
21,2400	TC 21,2777	PARAGRAPH # 125	RCPE MODULE 3, SIDE B, SENSE LINE SET 11 (WIRES 161-176)
21,3000	TC 21,3377	PARAGRAPH # 126	RCPE MODULE 3, SIDE A, SENSE LINE SET 12 (WIRES 177-192)
21,3400	TC 21,3777	PARAGRAPH # 127	RCPE MODULE 3, SIDE B, SENSE LINE SET 12 (WIRES 177-192)
22,2000	TC 22,2377	PARAGRAPH # 130	RCPE MODULE 4, SIDE A, SENSE LINE SET 1 (WIRES 1-16)
22,2400	TC 22,2777	PARAGRAPH # 131	RCPE MODULE 4, SIDE B, SENSE LINE SET 1 (WIRES 1-16)
22,3000	TC 22,3377	PARAGRAPH # 132	RCPE MODULE 4, SIDE A, SENSE LINE SET 2 (WIRES 17-32)
22,3400	TC 22,3777	PARAGRAPH # 133	RCPE MODULE 4, SIDE B, SENSE LINE SET 2 (WIRES 17-32)
23,2000	TC 23,2377	PARAGRAPH # 134	RCPE MODULE 4, SIDE A, SENSE LINE SET 3 (WIRES 33-48)
23,2400	TC 23,2777	PARAGRAPH # 135	RCPE MODULE 4, SIDE B, SENSE LINE SET 3 (WIRES 33-48)
23,3000	TC 23,3377	PARAGRAPH # 136	RCPE MODULE 4, SIDE A, SENSE LINE SET 4 (WIRES 49-64)
23,3400	TC 23,3777	PARAGRAPH # 137	RCPE MODULE 4, SIDE B, SENSE LINE SET 4 (WIRES 49-64)
24,2000	TC 24,2377	PARAGRAPH # 140	RCPE MODULE 4, SIDE A, SENSE LINE SET 5 (WIRES 65-80)
24,2400	TC 24,2777	PARAGRAPH # 141	RCPE MODULE 4, SIDE B, SENSE LINE SET 5 (WIRES 65-80)
24,3000	TC 24,3377	PARAGRAPH # 142	RCPE MODULE 4, SIDE A, SENSE LINE SET 6 (WIRES 81-96)
24,3400	TC 24,3777	PARAGRAPH # 143	RCPE MODULE 4, SIDE B, SENSE LINE SET 6 (WIRES 81-96)
25,2000	TC 25,2377	PARAGRAPH # 144	RCPE MODULE 4, SIDE A, SENSE LINE SET 7 (WIRES 97-112)
25,2400	TC 25,2777	PARAGRAPH # 145	RCPE MODULE 4, SIDE B, SENSE LINE SET 7 (WIRES 97-112)
25,3000	TC 25,3377	PARAGRAPH # 146	RCPE MODULE 4, SIDE A, SENSE LINE SET 8 (WIRES 113-128)
25,3400	TC 25,3777	PARAGRAPH # 147	RCPE MODULE 4, SIDE B, SENSE LINE SET 8 (WIRES 113-128)

PARAGRAPHS GENERATED FOR THIS ASSEMBLY; ADDRESS LIMITS AND THE MANUFACTURING LOCATION CODE ARE SHOWN FOR EACH

26,2000	TC 26,2377	PARAGRAPH # 150	RCPE MODULE 4, SIDE A, SENSE LINE SET 9 (WIRES 129-144)
26,2400	TC 26,2777	PARAGRAPH # 151	RCPE MODULE 4, SIDE B, SENSE LINE SET 9 (WIRES 129-144)
26,3000	TC 26,3377	PARAGRAPH # 152	RCPE MODULE 4, SIDE A, SENSE LINE SET 10 (WIRES 145-160)
26,3400	TC 26,3777	PARAGRAPH # 153	RCPE MODULE 4, SIDE B, SENSE LINE SET 10 (WIRES 145-160)
27,2000	TC 27,2377	PARAGRAPH # 154	RCPE MODULE 4, SIDE A, SENSE LINE SET 11 (WIRES 161-176)
27,2400	TC 27,2777	PARAGRAPH # 155	RCPE MODULE 4, SIDE B, SENSE LINE SET 11 (WIRES 161-176)
27,3000	TC 27,3377	PARAGRAPH # 156	RCPE MODULE 4, SIDE A, SENSE LINE SET 12 (WIRES 177-192)
27,3400	TC 27,3777	PARAGRAPH # 157	RCPE MODULE 4, SIDE B, SENSE LINE SET 12 (WIRES 177-192)
30,2000	TC 30,2377	PARAGRAPH # 160	RCPE MODULE 5, SIDE A, SENSE LINE SET 1 (WIRES 1-16)
30,2400	TC 30,2777	PARAGRAPH # 161	RCPE MODULE 5, SIDE B, SENSE LINE SET 1 (WIRES 1-16)
30,3000	TC 30,3377	PARAGRAPH # 162	RCPE MODULE 5, SIDE A, SENSE LINE SET 2 (WIRES 17-32)
30,3400	TC 30,3777	PARAGRAPH # 163	RCPE MODULE 5, SIDE B, SENSE LINE SET 2 (WIRES 17-32)
31,2000	TC 31,2377	PARAGRAPH # 164	RCPE MODULE 5, SIDE A, SENSE LINE SET 3 (WIRES 33-48)
31,2400	TC 31,2777	PARAGRAPH # 165	RCPE MODULE 5, SIDE B, SENSE LINE SET 3 (WIRES 33-48)
31,3000	TC 31,3377	PARAGRAPH # 166	RCPE MODULE 5, SIDE A, SENSE LINE SET 4 (WIRES 49-64)
31,3400	TC 31,3777	PARAGRAPH # 167	RCPE MODULE 5, SIDE B, SENSE LINE SET 4 (WIRES 49-64)
32,2000	TC 32,2377	PARAGRAPH # 170	RCPE MODULE 5, SIDE A, SENSE LINE SET 5 (WIRES 65-80)
32,2400	TC 32,2777	PARAGRAPH # 171	RCPE MODULE 5, SIDE B, SENSE LINE SET 5 (WIRES 65-80)
32,3000	TC 32,3377	PARAGRAPH # 172	RCPE MODULE 5, SIDE A, SENSE LINE SET 6 (WIRES 81-96)
32,3400	TC 32,3777	PARAGRAPH # 173	RCPE MODULE 5, SIDE B, SENSE LINE SET 6 (WIRES 81-96)
33,2000	TC 33,2377	PARAGRAPH # 174	RCPE MODULE 5, SIDE A, SENSE LINE SET 7 (WIRES 97-112)
33,2400	TC 33,2777	PARAGRAPH # 175	RCPE MODULE 5, SIDE B, SENSE LINE SET 7 (WIRES 97-112)
33,3000	TC 33,3377	PARAGRAPH # 176	RCPE MODULE 5, SIDE A, SENSE LINE SET 8 (WIRES 113-128)
33,3400	TC 33,3777	PARAGRAPH # 177	RCPE MODULE 5, SIDE B, SENSE LINE SET 8 (WIRES 113-128)
34,2000	TC 34,2377	PARAGRAPH # 200	RCPE MODULE 5, SIDE A, SENSE LINE SET 9 (WIRES 129-144)
34,2400	TC 34,2777	PARAGRAPH # 201	RCPE MODULE 5, SIDE B, SENSE LINE SET 9 (WIRES 129-144)
34,3000	TC 34,3377	PARAGRAPH # 202	RCPE MODULE 5, SIDE A, SENSE LINE SET 10 (WIRES 145-160)
34,3400	TC 34,3777	PARAGRAPH # 203	RCPE MODULE 5, SIDE B, SENSE LINE SET 10 (WIRES 145-160)
35,2000	TC 35,2377	PARAGRAPH # 204	RCPE MODULE 5, SIDE A, SENSE LINE SET 11 (WIRES 161-176)
35,2400	TC 35,2777	PARAGRAPH # 205	RCPE MODULE 5, SIDE B, SENSE LINE SET 11 (WIRES 161-176)
35,3000	TC 35,3377	PARAGRAPH # 206	RCPE MODULE 5, SIDE A, SENSE LINE SET 12 (WIRES 177-192)
35,3400	TC 35,3777	PARAGRAPH # 207	RCPE MODULE 5, SIDE B, SENSE LINE SET 12 (WIRES 177-192)
36,2000	TC 36,2377	PARAGRAPH # 210	RCPE MODULE 6, SIDE A, SENSE LINE SET 1 (WIRES 1-16)
36,2400	TC 36,2777	PARAGRAPH # 211	RCPE MODULE 6, SIDE B, SENSE LINE SET 1 (WIRES 1-16)
36,3000	TC 36,3377	PARAGRAPH # 212	RCPE MODULE 6, SIDE A, SENSE LINE SET 2 (WIRES 17-32)
36,3400	TC 36,3777	PARAGRAPH # 213	RCPE MODULE 6, SIDE B, SENSE LINE SET 2 (WIRES 17-32)
37,2000	TC 37,2377	PARAGRAPH # 214	RCPE MODULE 6, SIDE A, SENSE LINE SET 3 (WIRES 33-48)
37,2400	TC 37,2777	PARAGRAPH # 215	RCPE MODULE 6, SIDE B, SENSE LINE SET 3 (WIRES 33-48)
37,3000	TC 37,3377	PARAGRAPH # 216	RCPE MODULE 6, SIDE A, SENSE LINE SET 4 (WIRES 49-64)
37,3400	TC 37,3777	PARAGRAPH # 217	RCPE MODULE 6, SIDE B, SENSE LINE SET 4 (WIRES 49-64)
40,2000	TC 40,2377	PARAGRAPH # 220	RCPE MODULE 6, SIDE A, SENSE LINE SET 5 (WIRES 65-80)
40,2400	TC 40,2777	PARAGRAPH # 221	RCPE MODULE 6, SIDE B, SENSE LINE SET 5 (WIRES 65-80)
40,3000	TC 40,3377	PARAGRAPH # 222	RCPE MODULE 6, SIDE A, SENSE LINE SET 6 (WIRES 81-96)
40,3400	TC 40,3777	PARAGRAPH # 223	RCPE MODULE 6, SIDE B, SENSE LINE SET 6 (WIRES 81-96)
41,2000	TC 41,2377	PARAGRAPH # 224	RCPE MODULE 6, SIDE A, SENSE LINE SET 7 (WIRES 97-112)

PARAGRAPHS GENERATED FOR THIS ASSEMBLY; ADDRESS LIMITS AND THE MANUFACTURING LOCATION CODE ARE SHOWN FOR EACH

41,2400	TC 41,2777	PARAGRAPH # 225	RCRE MODULE 6, SIDE E, SENSE LINE SET 7 (WIRES 97-112)
41,3000	TC 41,3377	PARAGRAPH # 226	RCRE MODULE 6, SIDE A, SENSE LINE SET 8 (WIRES 113-128)
41,3400	TC 41,3777	PARAGRAPH # 227	RCRE MODULE 6, SIDE B, SENSE LINE SET 8 (WIRES 113-128)
42,2000	TC 42,2377	PARAGRAPH # 230	RCRE MODULE 6, SIDE A, SENSE LINE SET 9 (WIRES 129-144)
42,2400	TC 42,2777	PARAGRAPH # 231	RCRE MODULE 6, SIDE B, SENSE LINE SET 9 (WIRES 129-144)
42,3000	TC 42,3377	PARAGRAPH # 232	RCRE MODULE 6, SIDE A, SENSE LINE SET 10 (WIRES 145-160)
42,3400	TC 42,3777	PARAGRAPH # 233	RCRE MODULE 6, SIDE B, SENSE LINE SET 10 (WIRES 145-160)
43,2000	TC 43,2377	PARAGRAPH # 234	RCRE MODULE 6, SIDE A, SENSE LINE SET 11 (WIRES 161-176)
43,2400	TC 43,2777	PARAGRAPH # 235	RCRE MODULE 6, SIDE B, SENSE LINE SET 11 (WIRES 161-176)
43,3000	TC 43,3377	PARAGRAPH # 236	RCRE MODULE 6, SIDE A, SENSE LINE SET 12 (WIRES 177-192)
43,3400	TC 43,3777	PARAGRAPH # 237	RCRE MODULE 6, SIDE B, SENSE LINE SET 12 (WIRES 177-192)

OCTAL LISTING FOR PARAGRAPH # 011, WITH PARITY BIT IN PINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

4000	00004 0	34054 1	56006 1	12665 1	52011 0	00006 1	34056 0	52006 0
4010	52011 0	00006 1	31264 0	52006 0	52011 0	34057 1	56006 1	13410 0
4020	52011 0	34064 1	56006 1	12000 1	52011 0	34060 0	56006 1	13256 1
4030	52011 0	34061 1	56006 1	12332 0	52011 0	34060 0	56006 1	13301 1
4040	52011 0	34062 1	56006 1	13472 1	52011 0	34063 0	56006 1	13157 0
4050	52011 0	34065 0	56006 1	12302 0	C: 12103 0	C: 02117 1	C: 36106 0	C: 02103 1
4060	C: 10100 1	C: 16107 0	C: 12100 0	C: 52107 0	C: 14106 0	C: 22107 1	C: 04025 1	C: 10003 0
4070	C: 14031 0	C: 20023 0	C: 24017 1	C: 30036 1	C: 34034 1	C: 40023 1	C: 44025 1	C: 50027 0
4100	C: 54000 0	C: 60000 1	00004 0	00006 1	00004 0	54001 1	00006 1	06004 0
4110	00006 1	14115 1	00006 1	00004 1	54001 1	44723 0	60001 0	00006 1
4120	14113 0	00006 1	00003 1	00002 0	34144 1	71021 1	00006 1	14121 1
4130	04132 0	31017 0	54023 1	30023 0	34616 1	C: 62341 0	34755 1	55012 1
4140	31021 0	04255 1	04143 0	05155 0	C: 37600 0	04364 1	41040 0	55012 1
4150	04616 1	C: 62341 0	04635 0	C: 62002 1	22007 0	54123 0	34736 1	71020 0
4160	61011 0	00000 0	00002 0	34753 1	60002 0	55026 1	23021 0	04204 0
4170	34211 0	56006 1	00006 1	04007 1	55027 0	34201 0	00006 1	01007 1
4200	02000 0	C: 62101 0	53037 0	05165 0	34735 1	55020 0	00002 0	22002 0
4210	04220 0	04224 1	30001 0	75012 0	60004 0	55041 1	05123 0	05155 0
4220	11041 1	04227 1	00002 0	04227 1	11042 1	04227 1	00002 0	05624 1
4230	C: 31206 1	34201 0	00006 1	01007 1	34242 1	55012 1	44360 1	54776 0
4240	04635 0	C: 61504 1	C: 00042 1	34201 0	00006 1	01007 1	34254 0	55012 1
4250	44360 1	54776 0	04635 0	C: 61476 0	C: 00041 1	74757 1	54123 0	34736 1
4260	71020 0	61011 0	10000 0	00002 0	24002 0	10123 0	14270 1	00002 0
4270	22002 0	34302 1	56006 1	00006 1	04007 1	52131 0	34201 0	00006 1
4300	01007 1	03550 1	C: 60101 1	55016 0	54003 0	74357 0	65007 0	54145 0
4310	00002 0	31016 1	14304 0	54003 0	74357 0	65007 0	00002 0	C: 00016 0
4320	C: 00011 1	C: 00004 0	54020 1	40020 1	40020 1	40020 1	40020 1	56020 0
4330	00002 0	54022 0	40022 0	40022 0	40022 0	40022 0	56022 1	00002 0
4340	60000 1	61000 1	60000 1	60000 1	60000 1	00002 0	C: 00037 0	C: 01740 0
4350	C: 76000 0	05072 1	05203 0	05261 1	05105 0	C: 30000 1	C: 03777 0	C: 00377 1
4360	C: 00023 0	C: 00021 1	C: 00025 0	C: 00012 1	34745 0	00006 1	05011 1	00002 0
4370	44745 1	00006 1	03011 1	00002 0	34747 1	00006 1	05011 1	00002 0

OCTAL LISTING FOR PARAGRAPH # 011, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNSEC FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

4400	00006 1	30025 0	52014 0	00002 0	00006 1	30156 0	20156 1	60154 1
4410	26154 0	54007 1	00002 0	54162 0	00002 0	54135 1	10000 0	30135 0
4420	17312 0	14417 0	44755 0	54154 0	54155 1	54156 1	00002 0	34746 0
4430	00016 1	05011 1	00002 0	44746 1	00006 1	03011 1	00002 0	44444 0
4440	60002 0	60004 0	04635 0	C: 10631 1	C: 02003 0	22007 0	54123 0	34726 1
4450	71020 0	61011 0	10000 0	14455 0	14164 1	24002 0	14427 1	56002 0
4460	54144 1	44736 0	01004 0	71020 0	56020 0	11042 1	04470 0	04473 0
4470	34755 1	57042 0	05137 1	00003 1	44747 0	00006 1	03011 1	34755 1
4500	55011 1	00144 0	56002 0	54144 1	11042 1	04507 1	04473 0	34755 1
4510	55011 1	00144 0	00006 1	64515 1	14516 0	40000 0	50002 0	60000 1
4520	00006 1	66744 0	16742 1	00006 1	50002 0	50000 1	30001 0	24002 0
4530	52062 1	22002 0	34740 0	70110 0	10000 0	14550 1	30061 0	04512 0
4540	C: 66161 1	00001 0	34562 1	60062 0	04512 0	C: 64420 0	00001 0	04560 0
4550	34562 0	60062 0	04512 0	C: 66673 0	00001 0	30061 0	04512 0	C: 51615 1
4560	50001 0	00001 0	C: 00765 0	C: 16450 1	34752 1	71300 1	10000 0	00002 0
4570	34744 1	54001 1	34615 1	70110 0	00006 1	14601 0	34750 1	70110 0
4600	16000 0	31001 0	61025 0	70001 1	00006 1	16745 0	31035 0	00006 1
4610	06001 0	74733 0	64735 1	55035 1	00002 0	C: 10102 0	52134 0	50002 0
4620	30000 1	24002 0	54001 1	22004 0	75012 0	56002 0	52134 0	50002 0
4630	02000 0	56134 1	56004 0	56134 1	00123 0	56002 0	50000 1	30000 1
4640	54004 1	75012 0	56002 0	50002 0	12000 1	35012 1	70133 1	60134 1
4650	00002 0	54135 1	56004 0	00006 1	04007 1	56135 0	75012 0	56001 0
4660	00004 0	00006 1	01007 1	50001 0	22000 0	56135 0	00006 1	01007 1
4670	00002 1	54004 1	30135 0	00002 0	52072 1	50002 0	30000 1	24002 0
4700	54001 1	22004 0	75012 0	56002 0	52072 1	50002 0	02000 0	56073 0
4710	56004 0	56073 0	00072 1	54164 0	24744 1	54023 1	30006 1	54165 1
4720	50002 0	30000 1	54004 1	75012 0	56002 0	56164 1	14642 0	00006 1
4730	01007 1	00002 0	C: 37777 1	C: 27777 1	C: 57777 1	C: 40000 0	C: 20000 0	C: 10000 0
4740	C: 04000 0	C: 02000 0	C: 01000 0	C: 00400 0	C: 00200 0	C: 00100 0	C: 00040 0	C: 00020 0
4750	C: 00100 0	C: 00004 0	C: 00002 0	C: 00001 0	C: 77777 0	C: 00000 1	C: 00005 1	C: 00007 0
4760	C: 00010 0	C: 00015 0	C: 00017 1	C: 00030 1	C: 00022 1	C: 00025 1	C: 00032 0	C: 00045 0
4770	C: 00046 0	C: 00050 1	C: 00055 1	C: 00060 1	C: 00062 0	C: 00120 1	C: 00140 1	C: 00144 0

OCTAL LISTING FOR PARAGRAPH # 012, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

5000	C: 00310 0	C: 00401 1	C: 00454 1	C: 00620 0	C: 00777 0	C: 01124 1	C: 01211 1	C: 01400 1
5010	C: 01426 0	C: 01776 0	C: 01777 1	C: 02177 1	C: 02400 1	C: 03000 1	C: 03400 0	C: 05000 1
5020	C: 06000 1	C: 07000 0	C: 11000 1	C: 13000 0	C: 14000 1	C: 15000 0	C: 16000 0	C: 17000 1
5030	C: 17770 1	C: 21000 1	64736 1	55075 0	15036 0	41075 0	60000 1	55075 0
5040	15051 1	57075 1	51075 1	64734 0	40000 0	61075 1	55075 0	15051 1
5050	15067 1	00006 1	71075 0	55076 0	00006 1	75005 0	67742 1	00006 1
5060	71076 0	67722 1	00006 1	71075 0	20001 1	55075 0	00002 0	50000 1
5070	44734 1	00002 0	00004 0	65164 1	54063 0	00006 1	50002 0	30001 0
5100	52066 0	35163 0	56004 0	54061 1	12626 0	00004 0	54063 0	00006 1
5110	50002 0	31001 0	52066 0	35163 0	56004 0	12602 0	56002 0	67751 0
5120	56002 0	15112 1	22002 0	35163 0	56006 1	12707 1	40164 0	54001 1
5130	35163 0	54006 0	12706 0	54164 0	35163 0	54004 1	12777 0	00004 0
5140	54065 0	44752 1	26002 1	35163 0	56004 0	12024 0	00004 0	54063 0
5150	35163 0	56006 1	54165 1	20012 0	13073 1	35163 0	54004 1	12104 0
5160	30061 0	54004 1	16744 1	C: 02602 1	C: 00110 1	56001 0	00006 1	01007 1
5170	54006 0	00001 0	C: 77677 1	00004 0	54001 1	34733 1	26002 1	30006 1
5200	00006 1	04007 1	56001 0	00004 0	56002 0	54061 1	00006 1	50061 0
5210	30001 0	54063 0	35220 1	56006 1	13232 0	52062 1	64752 0	52006 0
5220	C: 02063 0	50002 0	30000 1	24002 0	56002 0	54063 0	30006 1	00006 1
5230	04007 1	54001 1	35235 0	54061 1	15212 1	15257 0	C: 72537 0	C: 73714 1
5240	10076 1	15261 0	15261 0	15244 1	11301 0	15256 1	15251 0	15256 1
5250	15256 1	37726 0	05072 1	C: 03563 1	C: 14063 1	15261 0	05221 0	C: 00764 1
5260	05240 1	10332 1	35220 1	54006 0	13415 0	30016 0	00006 1	01007 1
5270	00006 1	22012 1	30016 0	56006 1	52011 0	00003 1	50017 1	53153 0
5300	00006 1	50002 0	30001 0	53147 0	00006 1	35310 0	52006 0	C: 03453 0
5310	C: 02063 0	50002 0	30000 1	24002 0	55010 0	35320 0	22006 1	14640 0
5320	C: 20213 0	50002 0	40000 0	61010 1	00006 1	16744 1	16742 1	00004 0
5330	50002 0	30000 1	24002 0	54072 0	74757 1	60000 1	54071 0	30072 1
5340	75030 0	00006 1	74740 1	56072 1	74735 0	54066 0	50002 0	30000 1
5350	24002 0	54065 0	15363 0	00004 0	50002 0	30000 1	24002 0	00004 0
5360	54065 0	34753 1	54066 0	00006 1	35367 0	52006 0	C: 02224 1	C: 20103 1
5370	22073 0	22006 1	22073 0	75024 0	10000 0	17753 0	30062 0	74745 1

CCTAL LISTING FOR PARAGRAPH # 014, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

6000	C: 00464 1	34764 0	54001 1	40000 0	52760 1	04635 0	C: 10024 0	C: 00024 1
6010	C: 00031 0	46121 0	06004 0	70110 0	54110 0	44752 1	00006 1	03012 1
6020	00052 0	C: 41000 1	37727 1	56004 0	12022 1	00006 1	36021 0	15165 1
6030	C: 03041 1	C: 66107 1	36041 1	00004 0	22000 1	50002 0	30000 1	22006 1
6040	12200 0	C: 56063 1	00003 1	00006 1	22164 1	30006 1	54165 1	74735 0
6050	54115 0	54023 1	16073 1	22006 1	16145 1	00006 1	50116 1	30001 0
6060	52155 1	34755 1	54156 1	54163 1	30165 0	54006 0	10023 1	16102 0
6070	10067 1	15126 0	24164 1	50164 1	30005 1	10000 0	16365 0	C: 00177 0
6100	54023 1	76077 0	54020 1	10020 1	16252 0	16746 0	74753 0	10000 0
6110	16151 0	50164 1	40001 1	10000 0	16220 0	C: 77773 1	24164 1	54116 0
6120	66254 1	10000 0	67746 0	16130 1	30120 1	26116 0	50020 0	76276 0
6130	00006 1	66141 1	75012 0	65012 1	56116 1	60115 1	54004 1	50020 0
6140	76276 0	74357 0	65007 0	56116 1	54003 0	50020 0	76276 0	37736 1
6150	54020 1	30120 1	54130 1	24164 1	50164 1	40000 0	10000 0	24130 0
6160	16161 0	54116 0	77745 1	00006 1	16167 0	30115 1	26116 0	50130 0
6170	40046 1	26116 0	77747 0	00006 1	16207 0	77745 1	00006 1	16211 1
6200	20116 1	54164 1	75012 0	64741 1	54116 0	50020 0	36276 1	30120 1
6210	16215 0	35007 0	56116 1	54003 0	74357 0	26116 0	50020 0	36276 1
6220	34360 0	70020 1	66225 1	10000 0	16236 1	C: 77767 1	66115 1	10000 0
6230	50000 1	46247 1	16240 0	50163 0	46245 0	16240 0	50163 0	46247 1
6240	26166 1	54116 0	50020 0	76276 0	C: 00002 0	C: 00006 1	C: 00006 1	C: 00002 0
6250	C: 00003 1	C: 00006 1	10020 1	16266 1	C: 77722 0	24164 1	50164 1	30000 1
6260	54117 1	35013 0	54004 1	70020 1	50000 1	16337 1	54004 1	10020 1
6270	50000 1	12000 1	10163 1	12017 1	12017 1	12121 0	C: 00122 0	16510 1
6300	17074 1	17660 1	17404 1	16706 1	16473 0	16055 0	17627 1	16504 1
6310	16623 1	16526 1	17337 0	16562 1	16631 1	17342 1	17621 1	17577 1
6320	17602 0	17606 1	17624 1	16754 0	16752 0	17041 1	17334 0	17462 0
6330	17430 0	17010 0	17065 1	17000 1	16334 1	17575 0	17616 0	12345 0
6340	12352 0	12355 1	12361 0	12365 1	12373 0	12407 1	12416 1	12401 1
6350	12412 0	12470 1	12475 1	12450 0	12510 0	12517 1	12460 0	30165 0
6360	54004 1	24164 1	50164 1	40000 0	67752 0	54116 0	74356 1	56116 1
6370	77725 1	00006 1	74747 0	50000 1	16375 1	06425 1	16064 1	06417 0

OCTAL LISTING FOR PARAGRAPH # 015, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

6400	16064 1	06422 0	16064 1	06425 1	16462 1	06425 1	16147 1	06425 1
6410	16466 1	76425 1	16471 1	06425 1	34766 1	54020 1	16255 1	50120 1
6420	46046 1	16424 1	50120 1	40047 0	26116 0	40116 0	64772 1	10000 0
6430	30120 1	16426 1	35007 0	56116 1	54003 0	74357 0	26116 0	00006 1
6440	30155 0	50116 1	52001 1	10163 1	16457 0	00002 0	00706 1	30160 0
6450	50116 1	52003 0	00006 1	30162 1	50116 1	52005 0	00002 0	30156 0
6460	50116 1	54002 1	00002 0	37735 1	54020 1	16111 1	34735 1	54020 1
6470	16111 1	36112 0	16150 1	50116 1	30002 0	54156 1	00006 1	50116 1
6500	30001 0	52155 1	34753 1	16063 0	22007 0	50116 1	30000 1	16060 0
6510	00006 1	50116 1	30001 0	52155 1	00006 1	50116 1	30003 1	52160 1
6520	00006 1	50116 1	37005 1	52162 0	44752 0	16063 0	00006 1	50116 1
6530	30001 0	52155 1	50166 0	52001 1	50163 0	36247 0	26166 1	10163 1
6540	16555 0	16553 0	54163 1	54156 1	52160 1	50166 0	51775 0	52162 0
6550	50166 0	51777 1	16064 1	54156 1	16064 1	54163 1	56156 0	50166 0
6560	53777 0	16064 1	00006 1	50116 1	30001 0	52155 1	50166 0	52001 1
6570	50163 0	36247 0	26166 1	10163 1	16613 1	16514 0	00006 1	50116 1
6600	30003 1	52160 1	50166 0	51775 0	00006 1	50116 1	30005 1	52162 0
6610	50166 0	51777 1	16064 1	00006 1	50116 1	30003 1	52160 1	30156 0
6620	50166 0	53777 0	16520 1	24164 1	50164 1	30000 1	50116 1	54000 0
6630	16064 1	24164 1	50164 1	30000 1	50116 1	60000 1	54004 1	75012 0
6640	50000 1	32000 0	54117 1	30165 0	74350 1	64350 0	60164 1	50120 1
6650	54052 1	30117 0	77745 1	00006 1	16665 0	30165 0	54006 0	30117 0
6660	54004 1	75012 0	64741 1	54164 0	16045 1	30117 0	66254 1	10000 0
6670	30117 0	16700 1	30120 1	60117 0	50000 1	30000 1	54117 1	16652 1
6700	54003 0	74357 0	50000 1	31400 1	54117 1	16652 1	50164 1	30001 0
6710	50116 1	60000 1	54004 1	75012 0	50000 1	32000 0	54117 1	16652 1
6720	30165 0	54004 1	50164 1	30001 0	54117 1	16652 1	10154 0	00002 0
6730	16732 0	16744 1	10155 1	00002 0	16736 1	16744 1	10156 1	00002 0
6740	16742 1	16744 1	50002 0	00001 0	50002 0	00002 0	30165 0	54006 0
6750	50164 1	00001 0	34735 1	16755 1	34355 0	26116 0	00006 1	50116 1
6760	00003 1	20160 1	00006 1	16765 1	27017 0	00006 1	50116 1	00005 1
6770	20162 0	00006 1	16774 1	07014 0	00006 1	50116 1	00001 0	17003 1

OCTAL LISTING FOR PARAGRAPH # 016, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

7000	00006 1	50116 1	30001 0	20155 1	00006 1	16064 1	07022 C	16064 1
7010	00006 1	50116 1	40001 1	17003 1	54001 1	34755 1	17021 1	54001 1
7020	36250 C	56001 0	50000 1	44734 1	54130 1	00006 1	24000 1	50001 0
7030	26155 1	54007 1	34755 1	60130 0	50001 0	26154 0	54007 1	00002 C
7040	17155 0	00006 1	50116 1	30003 1	52160 1	00006 1	40001 1	20160 1
7050	00006 1	17053 1	07017 0	00006 1	50116 1	30005 1	52162 0	00006 1
7060	40001 1	26162 0	00006 1	17065 1	07014 0	00006 1	50116 1	30001 C
7070	52155 1	00006 1	40001 1	17003 1	00006 1	50116 1	30002 0	20156 1
7100	50116 1	60000 1	60154 1	54154 0	16064 1	17006 1	50002 C	30000 1
7110	24002 0	54116 0	50116 1	30001 0	54156 1	34755 1	56155 0	54135 1
7120	00006 1	70156 0	56156 0	00006 1	70154 0	50156 1	30000 1	30000 1
7130	56135 0	50116 1	70135 1	20156 1	56154 1	00006 1	70135 1	20155 1
7140	00002 0	34755 1	54163 1	56156 0	60000 1	54001 1	00002 0	60155 0
7150	54155 1	00002 C	60154 1	54154 0	00002 0	54121 1	00002 C	34752 C
7160	54136 1	00006 1	22137 1	07112 1	52160 1	52155 1	52131 0	30156 C
7170	54132 0	30136 0	26116 0	07112 1	52156 1	20132 0	60154 1	60130 0
7200	54130 1	17203 0	54121 1	52162 0	52155 1	30136 0	26116 C	07112 1
7210	52132 0	20156 1	60154 1	60130 0	54154 0	00137 1	07022 0	00137 1
7220	00006 1	22141 0	54117 1	22140 1	17235 0	50002 C	30000 1	54140 0
7230	60000 1	60002 C	54117 1	64756 1	54141 1	36276 1	54116 0	00006 1
7240	50117 0	30004 0	52155 1	52123 0	17250 0	54140 0	44752 1	26117 1
7250	07112 1	00006 1	50117 0	30002 0	20155 1	18100 0	17245 1	00141 C
7260	34755 1	54156 1	22002 C	06726 1	17270 1	17310 0	44733 C	17271 0
7270	34733 1	54002 1	00006 1	24000 1	60156 0	54156 1	34755 1	60002 0
7300	60155 0	54155 1	34755 1	60002 C	60154 1	54154 0	54155 1	00001 C
7310	54156 1	17305 1	54155 1	00006 1	70156 1	54156 1	34755 1	56155 0
7320	17131 1	54135 1	00006 1	70155 1	52155 1	00006 1	70135 1	30001 C
7330	26154 0	00006 1	30155 0	00002 C	07157 0	34755 1	16063 0	34752 C
7340	54140 0	17245 0	44363 1	54140 0	36245 1	54136 1	07535 0	07161 0
7350	00006 1	20123 1	52155 1	52134 0	00006 1	30125 1	52160 1	00006 1
7360	30127 0	52162 0	30140 1	26116 0	07161 0	52123 0	52155 1	52125 0
7370	52160 1	52127 1	52162 0	30140 1	26116 0	07161 0	52134 0	52155 1

OCTAL LISTING FOR PARAGRAPH # 020, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "X" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

00,2000	13207 0	13530 0	13517 0	13610 1	13612 0	13174 1	12116 1	17673 0
00,2010	13232 0	13023 1	13176 0	13245 0	16357 1	13274 1	13247 1	36245 1
00,2020	70020 1	54021 0	13020 1	12101 1	C: 00024 1	50021 1	34736 1	54135 1
00,2030	10020 1	20050 0	16063 0	30135 0	00006 1	70156 1	54156 1	30135 0
00,2040	00004 1	70154 0	52155 1	30135 0	00006 1	70001 1	20156 1	16064 1
00,2050	30156 0	00006 1	70135 1	56155 0	00006 1	70135 1	56155 0	60001 0
00,2060	60000 1	54156 1	12064 0	26155 1	34755 1	54156 1	56154 1	00006 1
00,2070	70135 1	20155 1	00002 0	30135 0	00006 1	70155 1	54155 1	56001 0
00,2100	12060 1	30021 1	54135 1	00006 1	30156 0	20156 1	60154 1	60154 1
00,2110	54154 0	12110 1	54121 1	10135 1	12102 1	10020 1	07141 1	16064 1
00,2120	16064 1	34757 0	70020 1	54135 1	10020 1	12145 1	C: 00176 1	50135 0
00,2130	34736 1	54135 1	02073 1	52155 1	52160 1	52155 1	02073 1	52155 1
00,2140	52162 0	52155 1	02073 1	17423 1	54135 1	00006 1	30155 0	20155 1
00,2150	00006 1	12153 0	07022 0	00006 1	30160 0	20160 1	00006 1	12161 1
00,2160	07017 0	00006 1	30162 1	20162 0	00006 1	12167 1	07014 0	10135 1
00,2170	12144 0	16064 1	54135 1	06726 1	12176 1	12212 0	07262 0	30154 1
00,2200	12207 1	24135 0	00006 1	30156 0	20156 1	60154 1	26154 0	60000 1
00,2210	54000 0	12201 1	40135 1	16626 1	70116 0	10000 0	12224 0	34742 1
00,2220	70116 0	10000 0	07141 1	16064 1	54135 1	34744 1	00006 1	70116 0
00,2230	76250 1	50000 1	12233 0	12332 0	12342 1	12336 1	10163 1	12277 0
00,2240	12277 0	30135 0	63733 0	00006 1	62127 1	67752 0	54135 1	34755 1
00,2250	54001 1	56154 1	56155 0	02272 1	20155 1	56157 1	56160 0	02272 1
00,2260	20160 1	56161 1	56162 1	02272 1	20162 0	10135 1	54135 1	12242 0
00,2270	C: 04604 1	16064 1	60000 1	54156 1	34755 1	56001 0	00002 0	30135 0
00,2300	62733 0	00006 1	62322 0	67752 0	54135 1	34755 1	56154 1	56155 0
00,2310	54156 1	10135 1	54135 1	02300 0	C: 22650 1	34742 1	70116 0	10000 0
00,2320	07141 1	16064 1	50135 0	34736 1	54135 1	34742 1	70116 0	10000 0
00,2330	12031 0	12033 1	40135 1	62126 0	54135 1	12236 0	42126 1	60135 0
00,2340	40000 0	54135 1	16163 1	12346 0	12346 0	12145 1	40116 0	00006 1
00,2350	74746 1	54020 1	12103 0	44753 0	54136 1	54137 0	54140 0	10130 1
00,2360	12516 0	12563 1	12531 0	54156 1	07262 0	10154 0	12414 0	12371 1
00,2370	12413 1	56131 1	56130 0	56155 0	56154 1	10130 1	12422 0	12401 1

OCTAL LISTING FOR PARAGRAPH # 021, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

00,2400	12416 1	40154 0	00006 1	62405 1	24136 0	34733 1	54154 0	02630 0
00,2410	34753 1	54121 1	06064 0	24136 0	40131 0	12402 1	00006 1	40131 0
00,2420	52131 0	24136 1	10154 0	12437 1	12426 1	12433 0	10155 1	12437 1
00,2430	16064 1	12433 0	16064 1	00006 1	40155 1	52155 1	24136 0	40154 0
00,2440	67752 0	60130 0	10000 0	12505 1	C: 60001 0	12446 1	34736 1	60000 1
00,2450	60155 0	54155 1	34755 1	64733 1	26154 0	34736 1	60000 1	60131 1
00,2460	54131 0	34755 1	64733 1	26130 1	40154 0	60130 0	10000 0	12505 1
00,2470	C: 00133 0	12405 0	54140 0	40155 1	60131 1	00006 1	62405 1	12505 1
00,2500	00006 1	24137 1	00006 1	30131 1	20131 0	30130 0	60000 1	54000 0
00,2510	12500 1	52155 1	50137 1	02565 0	54156 1	16064 1	10000 0	12422 0
00,2520	40131 0	00006 1	62422 1	34736 1	60000 1	26131 0	34755 1	54130 1
00,2530	12363 1	10000 0	12416 1	30121 1	00006 1	62416 0	44736 0	12524 1
00,2540	22021 1	00006 1	74736 0	56001 0	60021 1	56001 0	12571 1	20001 1
00,2550	20001 1	20001 1	20001 1	20001 1	20001 1	20001 1	20001 1	20001 1
00,2560	20001 1	20001 1	20001 1	20001 1	52155 1	10140 0	C: 06552 0	12642 1
00,2570	52155 1	00006 1	10130 1	52155 1	40154 0	00006 1	70131 0	60155 0
00,2600	54000 0	12606 1	00006 1	60130 0	24154 1	12610 0	00006 1	62620 1
00,2610	00006 1	60130 0	00006 1	12616 0	00006 1	62624 0	24154 1	12625 0
00,2620	00006 1	12630 1	00006 1	26154 0	60130 0	22007 0	00006 1	10130 1
00,2630	54155 1	10136 1	00002 0	00002 0	00002 0	00006 1	40155 1	52155 1
00,2640	34755 1	00002 0	40154 0	60130 0	00006 1	12647 1	12570 0	34733 1
00,2650	54154 0	40131 0	60155 0	12624 1	44752 0	54137 0	54127 1	03010 0
00,2660	52131 0	07547 0	52131 0	10130 1	12721 0	12667 0	12715 1	56131 1
00,2670	56130 0	56155 0	56154 1	00006 1	12676 0	12405 0	56160 0	56157 1
00,2700	00006 1	12703 0	12405 0	56162 1	56161 1	00006 1	12710 1	12405 0
00,2710	10130 1	12721 0	12405 0	12715 1	12405 0	00006 1	40131 0	52131 0
00,2720	24127 0	00006 1	30131 1	52134 0	12732 1	00006 1	24137 1	00006 1
00,2730	30131 1	20131 0	30130 0	60000 1	54000 0	12725 1	02750 1	52160 1
00,2740	52155 1	52160 1	02750 1	52162 0	52155 1	52162 0	02750 1	17422 1
00,2750	30127 0	54136 1	10154 0	12767 1	12756 0	12763 0	10155 1	12767 1
00,2760	00002 0	12763 0	00002 0	00006 1	40155 1	52155 1	24136 0	44753 0
00,2770	54140 0	40154 0	60133 0	10000 0	13004 1	12777 0	12405 0	54140 0

OCTAL LISTING FOR PARAGRAPH # 022, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

00,3000	40155 1	60134 1	00006 1	62405 1	52155 1	50137 1	12565 1	C: 32506 0
00,3010	56002 0	52155 1	17547 0	52155 1	52160 1	07547 0	52160 1	52162 0
00,3020	07547 0	52162 0	00000 1	03010 0	07535 0	34755 1	56121 0	54141 1
00,3030	03317 1	30141 0	56121 0	00006 1	13036 0	12405 0	00006 1	30155 0
00,3040	50120 1	52143 1	03343 0	10154 0	13051 1	54001 1	50120 1	52045 1
00,3050	12405 0	44317 1	60135 0	10000 0	40000 0	13133 1	13065 0	44761 1
00,3060	54135 1	30154 1	54001 1	34755 1	13112 1	10135 1	13074 0	42024 1
00,3070	54135 1	07546 1	30155 0	13112 1	40000 0	54135 1	40000 0	50000 1
00,3100	34736 1	54130 1	00006 1	70155 1	56120 0	00006 1	70154 0	56001 0
00,3110	60130 0	56001 0	50120 1	52045 1	44753 0	54140 0	52123 0	52155 1
00,3120	52131 0	03151 1	52125 0	52155 1	52160 1	03151 1	52127 1	52155 1
00,3130	52162 0	03151 1	17423 1	54135 1	34755 1	56123 1	56122 0	56125 1
00,3140	56124 0	56127 1	56126 1	40135 1	50000 1	34736 1	00006 1	70154 0
00,3150	13062 1	10154 0	13170 0	13155 1	13162 0	10155 1	13170 0	00002 0
00,3160	13162 0	00002 1	44755 0	54136 1	00006 1	40155 1	50135 0	12564 0
00,3170	54136 1	52155 1	50135 0	12564 0	03300 1	16064 1	10163 1	13226 0
00,3200	13226 0	03317 1	22163 0	00006 1	30155 0	50120 1	52043 1	03343 0
00,3210	10135 1	13213 0	16064 1	63733 0	00006 1	63221 0	22007 0	22116 1
00,3220	12313 1	50135 0	34735 1	54135 1	34755 1	12036 1	06726 1	16064 1
00,3230	16064 1	17673 1	44751 1	26166 1	00006 1	50000 1	30003 1	52160 1
00,3240	00006 1	50166 0	30001 0	52162 0	16524 0	03317 1	17335 1	00006 1
00,3250	30155 0	50166 0	52001 1	50162 0	36247 0	26166 1	10163 1	13272 1
00,3260	16064 1	00006 1	30160 0	50166 0	51775 0	00006 1	30162 1	50166 0
00,3270	51777 1	16064 1	30156 0	16557 1	50120 1	30052 0	54117 1	16655 0
00,3300	30155 0	00006 1	70000 0	54156 1	34755 1	56155 0	00006 1	70154 0
00,3310	20001 1	20156 1	56154 1	00006 1	70000 0	20155 1	00002 0	00006 1
00,3320	22137 1	03300 1	52160 1	52155 1	52131 0	30156 0	54132 0	03300 1
00,3330	52156 1	20132 0	60154 1	60130 0	54130 1	13337 1	54121 1	52162 0
00,3340	52155 1	03300 1	17210 1	34755 1	54135 1	10154 0	13405 1	13351 1
00,3350	13373 1	56156 0	56155 0	54154 0	34757 0	54135 1	10154 0	13405 1
00,3360	13362 1	13376 1	56155 0	54154 0	34757 0	26135 1	10154 0	12405 1
00,3370	00002 0	13376 1	13453 1	10000 0	13402 0	10155 1	34755 1	13453 1

OCTAL LISTING FOR PARAGRAPH # 023, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

00,3400	13402 0	13452 1	52155 1	05716 1	C: 21302 0	62444 1	00006 1	63456 0
00,3410	52155 1	22021 1	00006 1	74736 0	52155 1	56021 1	26155 1	22214 0
00,3420	00006 1	70154 0	62566 0	54130 1	30154 1	22007 0	00006 1	10130 1
00,3430	00006 1	74736 0	26130 1	00006 1	74736 0	52155 1	00006 1	10130 1
00,3440	54131 0	34755 1	56001 0	00006 1	10130 1	54001 1	30131 1	20155 1
00,3450	00006 1	13455 1	34733 1	54154 0	54155 1	00002 0	64737 0	00006 1
00,3460	63512 0	52155 1	22021 1	00006 1	74736 0	52155 1	56021 1	26155 1
00,3470	33007 0	00006 1	70154 0	62270 0	13423 0	00006 1	30156 0	20156 1
00,3500	60154 1	26154 0	24135 0	00006 1	30156 0	20156 1	60154 1	26154 0
00,3510	60000 1	54022 0	10022 0	10022 0	13475 0	13417 1	13470 0	06726 1
00,3520	13523 1	13526 1	13526 1	00006 1	40155 1	52155 1	34737 0	26154 0
00,3530	52155 1	20001 1	54000 0	13536 0	00006 1	40001 1	52155 1	30154 1
00,3540	60000 1	54001 1	13553 0	50000 1	34735 1	60000 1	00006 1	60154 1
00,3550	54154 0	40155 1	54155 1	00006 1	30155 0	52134 0	03300 1	07225 0
00,3560	C: 00003 1	C: 14441 0	C: 37325 1	C: 53250 0	C: 60764 1	C: 12146 1	C: 21276 1	C: 75466 1
00,3570	C: 71471 0	C: 00236 0	C: 32757 0	32470 0	07111 1	00006 1	30156 0	26156 1
00,3600	60154 1	26154 0	00006 1	30156 0	20156 1	60154 1	26154 0	16064 1
00,3610	23621 0	13613 1	33713 1	54136 1	06726 1	13625 1	13721 0	00006 1
00,3620	40155 1	52155 1	23724 1	56136 0	54127 0	44736 0	60154 1	10000 0
00,3630	13721 1	13707 0	13642 0	10155 1	34755 1	13637 1	13642 0	54155 1
00,3640	54154 0	00136 0	00006 1	40155 1	64736 1	52155 1	52134 0	03343 0
00,3650	10135 1	13714 1	52155 1	52134 0	52155 1	07225 0	C: 00006 1	C: 13240 0
00,3660	C: 23630 0	C: 74721 0	C: 47775 1	C: 02440 0	C: 20237 0	C: 75067 1	C: 70742 1	C: 03436 0
00,3670	C: 26756 1	C: 74027 0	C: 57640 1	C: 03046 0	C: 07143 0	C: 76654 1	C: 42244 0	32470 0
00,3700	07111 1	00136 0	00006 1	40155 1	64736 1	52155 1	00137 1	00006 1
00,3710	40155 1	64737 0	52155 1	16064 1	50000 1	34736 1	54135 1	02073 1
00,3720	13652 1	00006 1	13637 1	00006 1	30165 0	05722 0	C: 01301 1	34755 1
00,3730	13627 1	34737 0	13640 1	C: 77763 0	13702 0	35000 1	00004 0	54002 1
00,3740	34752 0	54070 1	50000 1	21323 1	00006 1	13753 1	10070 1	12741 1
00,3750	52134 0	05706 0	C: 31104 0	32772 1	54061 1	30004 0	60070 0	54001 1
00,3760	33774 0	15211 1	04645 1	50070 0	55323 0	05123 0	34755 1	50006 1
00,3770	57323 1	05137 1	5261 1	C: 03760 0	C: 03766 0	C: 03775 1	C: 03776 1	CKSM 72464 1

OCTAL LISTING FOR PARAGRAPH # 024, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "&" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

01,2000	C: 76466 1	C: 76731 0	00010 0	00020 0	00010 0	00026 0	00010 0	00056 1
01,2010	00062 0	00172 1	00145 1	00163 0	00010 0	00174 0	C: 21000 1	C: 05155 0
01,2020	C: 04760 0	C: 00144 0	C: 05261 1	C: 04660 0	C: 76300 0	C: 75427 1	C: 03710 1	C: 32000 0
01,2030	C: 03632 0	C: 66067 0	C: 02631 1	C: 75173 0	C: 26063 0	C: 05000 1	C: 02613 1	C: 26063 0
01,2040	C: 02734 0	C: 75533 0	C: 27710 1	C: 14000 1	C: 02414 1	C: 50067 0	C: 10000 0	C: 02223 0
01,2050	C: 54067 1	C: 26060 0	C: 02654 1	C: 50067 0	C: 77777 0	C: 75436 1	C: 03710 1	C: 00031 0
01,2060	C: 05771 1	C: 35711 1	C: 76355 0	C: 74110 1	C: 05710 1	C: 20000 0	C: 02540 1	C: 56067 0
01,2070	C: 04704 0	C: 75423 0	C: 03710 1	C: 77777 0	C: 75433 1	C: 03710 1	C: 25000 0	C: 03547 1
01,2100	C: 64067 1	C: 00062 0	C: 75211 1	C: 03710 1	C: 00764 1	C: 75370 1	C: 03710 1	C: 76260 1
01,2110	C: 74231 1	C: 03710 1	C: 12000 1	C: 03227 0	C: 74067 0	C: 00764 1	C: 75477 1	C: 03710 1
01,2120	C: 77777 0	C: 75423 0	C: 03710 1	C: 13000 0	C: 03012 1	C: 30065 1	C: 77777 0	C: 75345 1
01,2130	C: 03710 1	C: 01477 1	C: 75935 0	C: 74067 0	C: 52777 1	C: 02070 1	C: 42067 0	C: 52777 1
01,2140	C: 02073 1	C: 42067 0	C: 46777 1	C: 02024 0	C: 10067 1	C: 46777 1	C: 05655 1	C: 04067 1
01,2150	C: 52777 1	C: 02575 1	C: 74067 0	C: 22000 1	C: 02463 1	C: 46067 1	C: 00310 0	C: 74166 0
01,2160	C: 01710 0	C: 00310 0	C: 74166 0	C: 01710 0	C: 20000 0	C: 02206 1	C: 66067 0	C: 00310 0
01,2170	C: 74166 0	C: 01710 0	C: 77777 0	C: 74326 0	C: 01710 0	C: 77777 0	C: 74361 0	C: 01710 0
01,2200	C: 00144 0	C: 75054 1	C: 03710 1	C: 30000 1	C: 02562 0	C: 10063 0	C: 17000 1	C: 03354 0
01,2210	C: 74067 0	35015 0	54003 0	34745 0	70111 1	10000 0	32340 1	62341 0
01,2220	55444 0	22342 1	55476 1	34737 0	70111 1	00006 1	12235 0	31444 1
01,2230	00006 1	72342 1	55444 0	32344 0	55476 1	00003 1	32336 0	04616 1
01,2240	C: 20353 0	12247 0	12253 0	12236 0	34751 0	05464 1	15155 1	00064 0
01,2250	04674 0	C: 40115 0	15472 1	40156 1	74737 1	10000 0	32000 0	62001 1
01,2260	61326 1	00006 1	62236 1	20111 0	74737 1	00006 1	12274 0	44741 0
01,2270	61327 0	00006 1	62236 1	31327 0	61326 1	22007 0	53244 0	00064 0
01,2300	04674 0	C: 40115 0	00003 1	40106 1	74737 1	00006 1	15472 1	32237 1
01,2310	04616 1	C: 20353 0	05472 0	12320 0	12307 0	34751 0	05464 1	15155 1
01,2320	34753 1	052 3 0	C: 02217 0	C: 56066 1	15155 1	32337 1	04616 1	C: 20361 1
01,2330	05472 0	05472 0	05472 0	36007 0	05464 1	15155 1	C: 01457 0	C: 01460 1
01,2340	C: 25101 0	C: 0522 1	C: 03146 1	C: 77445 1	C: 77622 1	02442 1	30117 0	50130 0
01,2350	54046 1	16064 1	02442 1	40117 1	02347 0	02430 1	50117 0	30000 1
01,2360	12347 1	02430 1	50117 0	40000 0	12347 1	02430 1	50130 0	30046 0
01,2370	50117 0	540 0	16064 1	02430 1	50117 0	30000 1	50130 0	56046 0

OCTAL LISTING FOR PARAGRAPH # 025, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "Z" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

01,2400	12370 0	2430 1	50117 0	30000 1	50130 0	26046 1	16064 1	02442 1
01,2410	30117 0	12404 1	02430 1	50117 0	40000 0	12404 1	02442 1	50130 0
01,2420	40050 0	51130 0	60046 0	00006 1	66064 0	50130 0	56046 0	16651 1
01,2430	40117 1	64772 0	10000 0	30120 1	12441 0	35007 0	56117 0	54003 0
01,2440	74357 0	26117 1	30120 1	54130 1	10020 1	24130 0	00002 0	00002 0
01,2450	10020 1	30117 0	04621 0	10154 0	16064 1	16651 1	16064 1	16651 1
01,2460	10121 1	12463 0	16064 1	54121 1	10020 1	12451 1	C: 00360 1	16651 1
01,2470	10020 1	66726 1	16064 1	16651 1	16064 1	10020 1	12504 0	C: 12000 1
01,2500	06726 1	16064 1	16064 1	16651 1	06726 1	16651 1	16651 1	16064 1
01,2510	10020 1	16643 1	05675 0	02430 1	50120 1	30052 0	12370 0	34762 0
01,2520	70117 1	50000 1	34735 1	54131 0	34745 0	00006 1	70117 1	54130 1
01,2530	00004 0	50000 1	30074 1	54002 1	34741 1	00006 1	70117 1	72577 1
01,2540	50000 1	12542 1	30131 1	00006 1	04002 1	12554 0	30131 1	00006 1
01,2550	06002 0	12554 0	40131 0	70002 1	50130 0	54074 0	00003 1	34737 0
01,2560	00006 1	70117 1	72577 1	50000 1	12565 1	40002 1	70131 0	10000 0
01,2570	12600 1	16720 0	12000 1	05675 0	05675 0	30002 0	12566 1	C: 00014 1
01,2600	24164 1	16064 1	54061 1	10400 1	12621 1	10454 0	12621 1	10530 0
01,2610	12621 1	10604 1	12621 1	10660 0	12621 1	22061 0	30002 0	05706 0
01,2620	C: 31201 0	64752 0	22007 0	50000 1	21777 0	26063 0	34755 1	54064 1
01,2630	32635 0	54062 1	50064 0	10167 0	12675 0	C: 00007 0	12675 0	30063 1
01,2640	50064 0	54167 0	75004 1	50064 0	54166 1	10064 1	12662 0	54121 1
01,2650	30166 0	54120 0	10067 1	12662 0	05675 0	05675 0	54067 1	52066 1
01,2660	52165 1	15160 1	52166 0	50064 0	52165 1	50067 0	40167 0	60063 1
01,2670	00006 1	65167 0	30064 0	54067 1	15160 1	33034 0	26064 1	10062 1
01,2700	12631 0	22061 1	30002 0	05706 0	C: 31202 0	22164 1	30165 0	00004 0
01,2710	00006 1	04007 1	56001 0	50067 0	52165 1	52165 1	30165 0	00006 1
01,2720	01007 1	52165 1	50067 0	52155 1	52155 1	52157 0	50067 0	52157 0
01,2730	52157 0	52161 0	50067 0	52161 0	52161 0	52163 1	50067 0	52163 1
01,2740	52163 1	34755 1	56121 0	00006 1	12747 0	40166 1	54166 1	52167 0
01,2750	50067 0	52167 0	52167 0	35004 0	70167 0	54120 0	10166 1	34755 1
01,2760	12765 0	40166 1	54166 1	34753 1	56121 0	54067 1	00003 1	52165 1
01,2770	00006 1	62773 0	52006 0	40000 0	54753 1	54164 0	16053 0	00004 0

OCTAL LISTING FOR PARAGRAPH # 426, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

01,3000	40167 0	54167 0	36077 1	70006 0	00006 1	04007 1	54165 1	44755 0
01,3010	54131 0	13121 1	00004 0	10067 1	13017 0	00003 1	13217 1	34752 0
01,3020	00006 1	05011 1	52165 1	12713 1	54061 1	34755 1	54064 1	32635 0
01,3030	54062 1	50064 0	10167 1	13036 0	C: 00014 1	13045 1	33034 0	26064 1
01,3040	10062 1	13033 0	44753 0	54064 1	15160 1	40065 0	50064 0	60164 1
01,3050	00006 1	13053 0	13036 0	50064 0	40167 0	54063 0	50064 0	54167 0
01,3060	44350 1	70065 0	54741 1	56065 1	74350 1	50064 0	60165 0	54066 0
01,3070	10064 1	12062 0	12652 0	54164 0	34755 1	54130 1	35004 0	70167 0
01,3100	60063 1	54167 0	40000 0	13010 1	00004 0	44755 1	54131 0	56167 1
01,3110	75004 1	54011 1	45164 0	60001 0	00006 1	63121 0	10001 1	50000 0
01,3120	54000 0	10202 1	03172 0	05675 0	13125 0	10217 1	03172 0	05675 0
01,3130	13131 0	10233 1	03172 0	C: 67610 1	13135 1	10247 1	03172 0	05675 0
01,3140	12141 1	1263 1	03172 0	05675 0	13145 0	10277 1	03172 0	05675 0
01,3150	13151 0	10313 1	03172 0	05675 0	13155 1	10131 0	05675 0	05675 0
01,3160	13162 0	13207 0	10130 1	13165 1	12765 0	50060 1	27777 0	63133 0
01,3170	54067 1	12705 0	54132 0	60131 1	10000 0	40132 0	13202 0	13200 1
01,3200	54002 0	00002 0	54131 0	00006 1	22130 0	50130 0	00002 0	44755 0
01,3210	54067 1	00003 1	44752 1	00006 1	03011 1	10067 1	13112 0	34752 0
01,3220	13226 0	31361 1	54001 1	33225 1	15166 1	C: 66102 1	00006 1	05011 1
01,3230	52165 1	15165 1	54062 1	30002 0	00006 1	63524 1	40026 1	64744 1
01,3240	10000 0	66112 0	40000 0	63371 1	60002 0	10300 0	61400 1	13211 0
01,3250	13251 0	40002 1	64736 1	64736 1	56026 0	64735 1	60002 0	00006 1
01,3260	22007 0	57400 1	57401 0	57402 0	57403 1	57404 0	57405 1	57406 1
01,3270	57407 0	30063 1	50002 0	13274 1	53411 0	53413 1	53415 1	53417 0
01,3300	53421 0	53423 1	53425 1	53427 1	53431 1	65236 0	00006 1	15215 0
01,3310	13364 1	10000 0	61401 0	13317 0	64753 1	03375 0	C: 00001 0	10000 0
01,3320	61402 0	13325 1	64753 1	03375 0	C: 00002 0	10000 0	61403 1	13333 0
01,3330	64753 1	03375 0	C: 00003 1	10000 0	61404 0	13341 0	64753 1	03375 0
01,3340	C: 00004 0	10000 0	61405 1	13347 0	64753 1	03375 0	C: 00005 1	10000 0
01,3350	61406 1	13355 0	64753 1	03375 0	C: 00006 1	10000 0	61407 0	13362 0
01,3360	64753 1	03375 0	C: 00007 0	10000 0	03372 1	12266 0	64753 1	03375 0
01,3370	C: 00010 0	C: 40201 0	52062 1	05706 0	C: 31203 1	54064 1	50002 0	30000 1

OCTAL LISTING FOR PARAGRAPH # 127, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "3" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

01,3400	54002 1	24753 1	60064 0	50002 0	27377 1	40064 1	50002 0	12261 0
01,3410	00006 1	04007 1	54016 1	00006 1	22012 1	34734 0	57407 0	57406 1
01,3420	57405 1	57404 0	57403 1	57402 0	57401 0	57400 1	64733 1	26026 1
01,3430	54332 1	44755 0	54232 1	00006 1	45237 0	53431 1	53427 0	53425 1
01,3440	53423 1	53421 0	53417 0	53415 1	53412 1	53411 0	56001 0	00006 1
01,3450	01007 1	56001 0	52006 0	23435 1	34752 0	26002 1	55434 1	31152 0
01,3460	10000 0	13467 0	13464 0	13522 0	31153 1	00006 1	63522 1	00006 1
01,3470	42501 1	21153 0	11153 0	13512 0	13475 0	12476 0	11152 1	13512 0
01,3500	C: 00000 1	C: 20000 0	34736 1	27153 0	05203 0	C: 03517 1	C: 02063 0	33521 1
01,3510	53435 0	52006 0	34736 1	05203 0	C: 03467 1	C: 02063 0	13507 1	53147 0
01,3520	52006 0	C: 05261 1	53435 0	13525 1	52062 1	05716 1	C: 21204 1	30161 1
01,3530	60000 1	54155 1	23771 0	54157 0	33566 1	54707 0	30154 1	75007 1
01,3540	10000 0	13552 1	10154 0	10000 0	13652 1	35024 1	05105 0	C: 03040 0
01,3550	C: 20103 1	03566 1	75007 1	10000 0	13623 1	00006 1	50155 0	31437 0
01,3560	52706 1	30154 1	74757 1	67751 0	10000 0	13735 1	04631 1	13571 0
01,3570	13636 0	33775 1	54704 0	50155 0	31053 0	10000 0	24000 1	13602 1
01,3600	15436 1	13621 0	40000 0	54001 1	50155 0	41052 0	00006 1	60025 0
01,3610	10000 0	40000 0	67734 0	64753 1	60001 0	10000 0	34755 1	13621 0
01,3620	13621 0	64753 1	00704 1	33566 1	54157 0	23772 0	54707 0	30154 1
01,3630	76077 0	54154 0	00006 1	50155 0	31437 0	52706 1	50155 0	31053 0
01,3640	54704 0	00006 1	63646 0	33774 0	56704 1	00704 1	23776 1	56704 1
01,3650	40000 0	00704 1	54020 1	10020 1	13655 0	13753 1	33566 1	54707 0
01,3660	30154 1	54921 0	60021 1	50155 0	62003 0	54156 1	00006 1	50156 0
01,3670	32012 1	22756 0	10000 0	24000 1	13747 1	24000 1	54705 1	23775 1
01,3700	54704 0	30706 0	74742 0	10000 0	13742 1	50156 0	32000 0	15445 0
01,3710	53153 0	00006 1	40025 1	21153 0	00006 1	31151 0	21153 0	11152 1
01,3720	13730 1	13723 0	13616 1	11153 0	13730 1	12726 0	13616 1	12621 0
01,3730	33773 1	54704 0	00006 1	31153 1	00704 1	33775 1	54704 0	50155 0
01,3740	41053 1	15445 0	40706 1	54706 1	50156 0	32000 0	13575 1	56705 0
01,3750	50156 0	32000 0	13640 1	30157 1	54707 0	50155 0	32002 1	60154 1
01,3760	60154 1	60154 1	54156 1	12666 0	36250 0	26156 1	33566 1	54707 0
01,3770	13666 0	C: 03764 1	C: 03542 1	C: 45277 0	C: 05105 0	C: 05203 0	C: 05072 1	CKSM 60400 0

OCTAL LISTING FOR PARAGRAPH # 040, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

04,2000	C: 00312 0	C: 17755 0	C: 00065 1	C: 01265 1	C: 22437 1	C: 16067 1	C: 15625 1	C: 21042 1
04,2010	C: 31276 1	C: 04773 0	C: 25004 1	C: 06702 1	C: 16471 1	C: 01352 1	C: 21412 0	C: 20500 0
04,2120	C: 25477 1	C: 03367 0	C: 27533 1	C: 07571 0	05516 0	C: 00211 1	05516 0	C: 00214 1
04,2020	05476 1	32027 1	04616 1	C: 20477 1	12031 0	12031 0	12031 0	C: 11343 0
04,2040	54774 1	34355 0	54366 0	31277 1	74746 1	10000 0	12065 1	40774 1
04,2050	62401 0	00006 1	12374 1	64753 1	00006 1	12373 0	30774 0	00006 1
04,2060	12117 1	40076 1	74753 0	10000 0	12072 1	05567 0	C: 01520 1	04457 0
04,2070	04635 0	C: 21051 0	32466 1	54155 1	50155 0	32425 1	76077 0	40000 0
04,2100	60774 0	10000 0	10155 1	12073 0	12324 1	30155 0	54773 0	40103 1
04,2110	74746 1	10000 0	12132 1	05516 0	C: 00163 0	15155 1	40074 0	74745 1
04,2120	10000 0	12123 1	12130 0	40074 0	74742 1	10000 0	32370 1	64747 1
04,2130	62371 0	05357 0	34755 1	00006 1	01007 1	32367 1	54374 0	05353 1
04,2140	C: 00014 1	06042 1	I: 77624 1	C: 27412 0	I: 77776 1	05516 0	C: 00124 0	05516 0
04,2150	C: 00055 1	34735 1	54107 0	05516 0	C: 00063 1	05516 0	C: 00056 1	05516 0
04,2160	C: 00141 0	05516 0	C: 00311 1	10774 1	12312 1	04457 0	35017 1	55055 1
04,2170	06011 1	44753 0	70076 1	54076 1	34756 1	54001 1	40000 0	52754 0
04,2200	42372 1	70074 0	54074 0	34755 1	54333 0	55321 1	04674 0	C: 75561 1
04,2210	04674 0	C: 40205 1	44775 1	55071 1	70075 1	54075 1	04674 0	C: 12650 1
04,2220	10774 1	12230 0	04674 0	C: 12645 0	30774 0	55010 0	04635 0	C: 12766 0
04,2230	41010 0	62330 0	00006 1	12252 1	40774 1	62330 0	00006 1	12252 1
04,2240	67751 0	00006 1	12264 1	64756 1	00006 1	12264 1	32326 1	70074 0
04,2250	10000 0	12261 1	42372 1	70074 0	54074 0	06011 1	00006 1	34755 1
04,2260	52754 0	22366 0	54374 0	12226 1	41010 0	66007 0	00006 1	12256 0
04,2270	64756 1	00006 1	12256 0	32326 1	70074 0	60774 0	40000 0	62331 1
04,2300	00016 1	12306 1	62327 0	00006 1	12306 1	12256 0	40075 1	74775 1
04,2310	26075 1	12222 0	32326 1	70074 0	10000 0	12320 0	05516 0	C: 00007 0
04,2320	50773 1	32467 0	00004 0	12274 1	04364 1	12067 0	C: 00500 1	C: 00305 1
04,2330	C: 00026 0	C: 00124 0	00004 0	50773 1	32425 1	55057 0	54020 1	30020 0
04,2340	77730 0	55061 0	54063 0	31057 1	00006 1	74744 0	74757 1	54001 1
04,2350	50773 1	32404 0	55060 1	74350 1	26001 1	31060 0	75012 0	64741 1
04,2360	05116 1	31057 1	76777 0	05314 1	04457 0	05155 0	C: 10335 0	C: 10144 1
04,2370	C: 37667 1	C: 40072 0	C: 00700 0	36250 0	54002 1	00006 1	32403 1	60002 0

NOTAL LISTING FOR PARAGRAPH # 141, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

04,2400	52036 0	C: 00116 0	C: 02067 1	C: 42067 0	C: 26207 0	C: 72641 1	C: 72457 1	C: 72225 1
04,2410	C: 72336 1	C: 71271 0	C: 64777 1	C: 33277 0	C: 32050 0	C: 31421 1	C: 75442 1	C: 75414 1
04,2420	C: 75276 0	C: 75153 1	C: 72635 1	C: 72455 0	C: 72223 1	C: 72034 0	C: 72000 1	C: 50400 0
04,2430	C: 50100 1	C: 51555 0	C: 50000 1	C: 60061 0	C: 77652 0	C: 27714 0	C: 27713 1	C: 27712 0
04,2440	C: 27711 1	C: 27710 1	C: 27704 1	C: 27677 1	C: 27271 0	C: 27264 1	C: 27263 0	C: 27657 0
04,2450	C: 27652 0	C: 27651 0	C: 27650 1	C: 27643 0	C: 27642 1	C: 27641 1	C: 27640 0	C: 27636 1
04,2460	C: 27631 0	C: 27626 0	C: 27625 0	C: 27624 1	C: 27614 1	C: 27006 1	C: 00030 1	C: 00002 0
04,2470	C: 00012 0	C: 00012 0	C: 00002 0	C: 00002 0	C: 00004 0	C: 00004 0	C: 00005 1	C: 00000 1
04,2500	C: 00001 1	C: 00003 1	C: 00003 1	C: 00003 1	C: 00003 1	C: 00002 0	C: 00002 0	C: 00002 0
04,2510	C: 00012 0	C: 00012 0	C: 00002 0	C: 00005 1	C: 00002 0	C: 00002 0	C: 00004 0	C: 00000 1
04,2520	I: 44011 0	C: 01011 0	C: 02735 1	I: 47135 0	C: 00012 1	C: 21577 1	I: 71406 0	I: 73525 1
04,2530	I: 77626 0	C: 60112 1	C: 00011 1	I: 77634 0	C: 21577 1	I: 71406 0	C: 00025 0	I: 73525 1
04,2540	I: 57406 1	C: 14027 1	C: 24007 0	C: 14023 0	I: 72405 0	C: 00001 0	C: 17767 1	I: 72405 0
04,2550	I: 77626 0	C: 50006 1	C: 00023 0	I: 53435 0	C: 03765 0	C: 00031 0	I: 77650 1	C: 02736 1
04,2560	52134 0	53167 1	25166 1	30006 1	75012 0	27167 1	51166 1	27777 0
04,2570	04622 0	02575 1	02574 0	25166 1	25166 1	52167 1	52006 0	22164 1
04,2600	50001 0	30011 0	24001 0	24001 0	53167 1	06042 1	I: 77624 1	C: 01166 1
04,2610	I: 77776 1	23167 0	16044 0	05137 1	44741 0	50064 0	26164 0	00072 1
04,2620	56012 0	54154 0	01004 0	34355 0	05072 1	C: 03577 1	C: 60101 1	00003 1
04,2630	00154 1	54011 1	04220 0	04224 1	04374 0	30001 0	55042 1	05133 0
04,2640	22007 0	34755 1	53051 0	32773 0	04616 1	C: 20324 1	15472 1	12651 0
04,2650	12643 0	53051 0	00006 1	12762 1	52155 1	06042 1	I: 77634 0	C: 21717 0
04,2660	C: 34041 0	C: 27044 1	I: 63275 0	C: 00007 0	C: 00001 0	C: 02207 0	I: 63256 0	I: 53435 0
04,2670	I: 77626 0	C: 61562 1	C: 00015 0	C: 34041 0	C: 27060 1	I: 63275 0	C: 00007 0	C: 00001 0
04,2700	I: 77725 1	C: 01015 0	C: 24037 0	I: 41406 0	I: 63245 1	C: 02207 0	I: 72441 0	C: 02215 0
04,2710	C: 26201 0	C: 00011 0	I: 72441 0	C: 02215 0	C: 26203 1	C: 00007 0	I: 41456 0	I: 47235 0
04,2720	C: 00011 0	C: 01023 0	I: 53552 0	I: 77656 1	C: 24001 0	C: 00023 0	I: 74241 0	C: 00015 0
04,2730	I: 77752 1	I: 53445 1	I: 77656 1	I: 50206 0	C: 00001 0	I: 65552 0	C: 26205 1	I: 50235 0
04,2740	C: 00001 0	I: 71244 0	C: 11747 1	C: 24020 0	I: 77625 0	C: 02205 1	C: 02205 1	I: 47145 1
04,2750	C: 00037 0	C: 21613 0	C: 01051 1	I: 77776 1	32774 1	04616 1	C: 20324 1	15472 1
04,2760	15472 1	12643 0	53001 0	00006 1	12767 1	56001 0	12654 0	06042 1
04,2770	I: 52034 1	C: 21574 1	C: 11660 0	C: 01420 0	C: 01532 1	I: 77220 1	C: 02746 0	C: 01555 0

OCTAL LISTING FOR PARAGRAPH # 042, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

04,3000	I: 47235 0	C: 01563 0	C: 03607 0	I: 77656 1	C: 03622 0	I: 53435 0	C: 02607 0	C: 37615 1
04,3010	C: 02746 1	C: 00000 1	C: 04000 0	C: 00000 1	C: 00200 0	C: 00700 1	C: 00400 0	C: 00000 1
04,3020	C: 10000 0	C: 00000 1	C: 00000 0	C: 00000 1	C: 01000 0	C: 00000 1	C: 00000 0	C: 00000 1
04,3030	C: 00100 0	C: 00000 1	C: 24631 1	C: 23146 0	C: 77467 1	C: 77777 0	C: 03110 1	C: 17665 1
04,3040	C: 00000 1	C: 00000 1	C: 37767 0	C: 27737 0	C: 40010 1	C: 40040 1	I: 43020 1	C: 02753 1
04,3050	C: 03665 1	I: 77614 1	C: 04273 0	I: 45131 0	C: 02672 1	C: 27777 0	C: 11112 0	C: 14045 0
04,3060	I: 56261 1	C: 20606 0	C: 00045 0	C: 32766 1	C: 10005 0	C: 14017 1	C: 02720 0	I: 60316 0
04,3070	C: 00047 1	I: 41275 1	C: 00017 1	C: 00041 1	I: 77657 0	C: 21576 0	I: 44206 0	C: 11025 0
04,3100	C: 16742 1	I: 60205 0	C: 00045 0	C: 00047 1	I: 53605 1	C: 00045 0	C: 20575 1	C: 02740 0
04,3110	I: 77650 1	C: 02753 1	I: 77656 1	C: 16712 1	C: 00045 0	C: 26720 0	I: 77656 1	C: 02722 1
04,3120	I: 72441 0	C: 02712 1	I: 77725 1	C: 00045 0	C: 24041 1	C: 02722 1	I: 76435 1	C: 02712 1
04,3130	I: 75214 1	C: 03705 0	C: 11144 0	C: 02673 1	I: 40056 0	C: 11142 0	C: 16674 0	C: 00045 0
04,3140	I: 43565 0	C: 02673 1	I: 52162 0	C: 11136 0	I: 75246 0	C: 02673 1	I: 77616 0	00003 1
04,3150	00006 1	23166 1	06042 1	I: 53135 0	C: 01502 1	C: 11214 0	I: 77775 1	C: 01503 0
04,3160	C: 25535 0	C: 01511 0	I: 77624 1	C: 27710 1	I: 51535 0	C: 01502 1	I: 53025 0	C: 11225 1
04,3170	C: 11175 1	I: 43174 1	C: 00000 1	C: 00223 1	C: 11200 0	I: 43174 1	C: 00002 0	C: 00063 1
04,3200	I: 50135 0	C: 01502 1	C: 11210 1	I: 77624 1	C: 26662 1	I: 52014 0	C: 01671 0	C: 11212 0
04,3210	I: 77624 1	C: 26735 1	I: 77614 1	C: 02676 1	I: 45131 0	C: 01502 1	C: 00000 1	C: 27421 0
04,3220	I: 77776 1	C: 05353 1	C: 04026 1	01166 1	C: 00002 0	C: 00000 1	I: 77420 1	C: 02711 0
04,3230	05353 1	C: 04022 0	06042 1	I: 77650 1	C: 02711 1	C: 00063 1	34737 0	70077 0
04,3240	10000 0	03252 1	31277 1	74743 1	00006 1	13247 1	44750 0	63255 0
04,3250	05734 1	06001 0	05504 0	C: 00007 0	14631 0	C: 00220 1	54016 1	56002 0
04,3260	54012 0	04400 1	34346 1	00006 1	02015 1	54073 1	40101 0	74735 0
04,3270	26101 0	34355 0	05072 1	C: 02077 0	C: 60101 1	00073 0	50064 0	54154 0
04,3300	05270 1	54016 1	56002 0	54012 0	04400 1	34755 1	56045 0	54073 1
04,3310	34751 0	00006 1	05011 1	34346 1	00073 1	56073 0	00006 1	74742 0
04,3320	54332 1	74346 0	63356 1	03353 1	34742 1	00006 1	70232 1	74346 0
04,3330	40000 0	03353 1	43261 1	60073 0	00006 1	13343 1	34750 1	70103 1
04,3340	10000 0	05270 1	03271 0	44750 0	70103 1	54103 1	03271 0	40103 1
04,3350	74750 0	26102 1	05270 1	60073 0	10000 0	03347 1	C: 77740 1	03347 1
04,3360	00002 0	C: 00022 1	05353 1	C: 07026 1	C: 30000 1	C: 03673 0	C: 10102 0	34753 1
04,3370	54333 0	05311 1	C: 00033 1	51171 1	13275 1	13400 1	13403 1	13403 1

OCTAL LISTING FOR PARAGRAPH # 164, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "1" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

05,2000	C: 02357 1	C: 20000 0	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1
05,2010	C: 00000 1	C: 16533	C: 30007 0	C: 77333 1	C: 56654 0	C: 00000 1	C: 00000 1	C: 06273 1	
05,2020	C: 03275 1	C: 01242 1	C: 24467 1	C: 00020 0	C: 17260 0	C: 00002 0	C: 00000 1	C: 22572 1	
05,2030	C: 27214 0	C: 01315 1	C: 26177 1	C: 77731 1	C: 55217 0	C: 32055 0	C: 22576 0	C: 10624 0	
05,2040	C: 10635 0	C: 37436 1	C: 01635 0	C: 01065 0	C: 31323 1	C: 20770 0	C: 13725 0	C: 02245 0	
05,2050	C: 06475 1	C: 00162 1	C: 33431 1	C: 22566 1	C: 24130 0	C: 02000 0	C: 00000 1	C: 00256 0	
05,2060	C: 17752 1	C: 77512 1	C: 67453 1	C: 00131 1	C: 26730 1	C: 77340 0	C: 32127 1	C: 24340 0	
05,2070	C: 03451 1	C: 13443	C: 02256 1	C: 01241 0	C: 25733 1	C: 03633 1	C: 12266 0	C: 13700 1	
05,2100	C: 01235 0	C: 03630 1	C: 32136 1	C: 00024 1	C: 32145 0	C: 24340 0	C: 32154 0	C: 07115 0	
05,2110	C: 00007 0	C: 01776	C: 12274 0	C: 03635 1	C: 12365 1	C: 01330 0	C: 05323 1	C: 03577 1	
05,2120	C: 01326 1	C: 01277 1	C: 03441 0	C: 32157 0	C: 32170 0	C: 00007 0	C: 74261 1	C: 76056 0	
05,2130	C: 01723 0	C: 01725 0	C: 01727 1	C: 01731 0	C: 01570 1	C: 76060 0	C: 04320 1	C: 01422 0	
05,2140	C: 07021 0	C: 07235 1	C: 04032 1	C: 24074 1	C: 52755 1	C: 76556 0	C: 01223 0	C: 01225 0	
05,2150	C: 01227 1	C: 01231	C: 01233 1	C: 76560 0	C: 07243 0	C: 07267 0	C: 77667 0	C: 07021 0	
05,2160	C: 07235 1	C: 04032 1	C: 03024 1	C: 02113 1	C: 34011 0	C: 34013 1	C: 34030 0	C: 42145 0	
05,2170	C: 03560 1	C: 67453 1	C: 32127 1	C: 24340 0	C: 02020 1	C: 02774 1	C: 07115 0	C: 01330 0	
05,2200	C: 01341 0	C: 25733 1	C: 00734 1	C: 12022 1	C: 05333 1	C: 13700 1	C: 32136 1	C: 00024 1	
05,2210	C: 32145 0	C: 24340 0	C: 32154 0	C: 32226 0	C: 05333 1	C: 04036 0	C: 00112 0	C: 01326 1	
05,2220	C: 01277 1	C: 03441 0	C: 32157 0	C: 52755 1	C: 05700 0	C: 77665 1	C: 12737 1	C: 02755 1	
05,2230	C: 12760 0	C: 65011 1	C: 32127 1	C: 24340 0	C: 32276 0	C: 14340 0	C: 03451 1	C: 13443 0	
05,2240	C: 13433 1	C: 03633 1	C: 12266 0	C: 00007 0	C: 03630 1	C: 32224 1	C: 32136 1	C: 00024 1	
05,2250	C: 32145 0	C: 24340 0	C: 32154 0	C: 07115 0	C: 00007 0	C: 01776 0	C: 12274 0	C: 03635 1	
05,2260	C: 12365 1	C: 02256 1	C: 04036 0	C: 00112 0	C: 01326 1	C: 01277 1	C: 03441 0	C: 32157 0	
05,2270	C: 00007 0	C: 03620 0	C: 03666 0	C: 03577 1	C: 02347 0	C: 77770 1	C: 74320 0	C: 03461 1	
05,2300	C: 03752 1	C: 03754 1	C: 74017 1	C: 32341 0	C: 32355 0	C: 01241 0	C: 13252 1	C: 13645 1	
05,2310	C: 03642 1	C: 03664	C: 12022 1	C: 02276 0	C: 32224 1	C: 32136 1	C: 00024 1	C: 32145 0	
05,2320	C: 24340 0	C: 32154 0	C: 07115 0	C: 12626 0	C: 13626 1	C: 13634 1	C: 02262 0	C: 02400 1	
05,2330	C: 03615 0	C: 00112 0	C: 01326 1	C: 01277 1	C: 03441 0	C: 32157 0	C: 32170 0	C: 03614 1	
05,2340	C: 74324 1	C: 75441 1	C: 03651 0	C: 02337 1	C: 03652 0	C: 03754 1	C: 03654 0	C: 03756 0	
05,2350	C: 03457 1	C: 03461 1	C: 03752 1	C: 03754 1	C: 75443 0	C: 24240 0	C: 57423 0	C: 32127 1	
05,2360	C: 24340 0	C: 32276 0	C: 14340 0	C: 02774 1	C: 25733 1	C: 26236 1	C: 32224 1	C: 32136 1	
05,2370	C: 00024 1	C: 32145 0	C: 24340 0	C: 32154 0	C: 32226 0	C: 12230 0	C: 02020 1	C: 00112 0	

OCTAL LISTING FOR PARAGRAPH # 045, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

05,2400	C: 01326 1	C: 01277 1	C: 03441 0	C: 32157 0	C: 32170 0	C: 00007 0	C: 77770 1	C: 12200 0
05,2410	C: 02214 1	C: 12201 1	C: 02215 0	C: 12206 0	C: 02214 1	C: 12207 1	C: 02215 0	C: 25167 0
05,2420	C: 25213 1	C: 32136 1	C: 00024 1	C: 32145 0	C: 24340 0	C: 32154 0	C: 07115 0	C: 00007 0
05,2430	C: 00007 0	C: 02020 1	C: 25173 0	C: 15207 0	C: 01326 1	C: 01277 1	C: 00007 0	C: 32157 0
05,2440	C: 52755 1	C: 02172 1	C: 02407 0	C: 02232 0	C: 02066 0	C: 02303 0	C: 02357 1	00004 0
05,2450	03105 0	12456 0	34736 1	05105 0	C: 77777 0	C: 77777 0	31035 0	74771 0
05,2460	64735 1	55035 1	34755 1	55365 1	54376 1	54377 0	54377 0	54320 1
05,2470	44644 1	55311 0	34736 1	00006 1	01011 0	44755 0	54055 0	34751 0
05,2500	55262 1	34355 0	54366 0	34755 1	55245 1	54371 0	55071 1	55257 1
05,2510	55260 0	55273 1	55360 1	55362 0	54333 0	55321 1	55501 0	00006 1
05,2520	01005 0	00006 1	01006 0	00006 1	01012 0	00006 1	01013 1	00006 1
05,2530	01014 0	41035 1	74771 0	10000 0	02540 1	34771 1	00006 1	05012 1
05,2540	02641 0	44755 0	55010 0	33360 1	55277 0	33065 1	55343 0	34751 0
05,2550	55322 1	33061 0	54111 1	35015 0	54003 0	33056 1	55444 0	33057 0
05,2560	55476 1	32000 0	55400 0	33062 0	55403 0	55406 0	33063 1	55405 0
05,2570	55410 1	34755 1	55407 1	34363 0	55404 1	34744 1	55411 0	35026 0
05,2600	64746 0	55300 1	00006 1	33365 1	52075 1	33366 1	54076 1	34737 0
05,2610	70177 0	63367 0	54077 0	00006 1	33371 1	52101 0	00006 1	33273 0
05,2620	52103 1	34744 1	64740 0	64741 1	70104 0	63374 1	54104 0	33375 0
05,2630	54105 1	34737 0	70106 1	63376 0	54106 1	33377 1	54107 0	04635 0
05,2640	C: 03211 0	01004 0	00006 1	34755 1	52754 0	00006 1	34755 1	52760 1
05,2650	00006 1	34755 1	52762 0	00006 1	34755 1	52756 1	00006 1	34755 1
05,2660	52752 0	00006 1	34755 1	52760 0	00002 0	24320 0	22002 0	00006 1
05,2670	04007 1	53433 0	31035 0	74750 0	00006 1	12701 1	64746 0	00006 1
05,2700	05012 1	03066 1	34350 0	71360 1	00006 1	12707 1	13103 1	41360 1
05,2710	00006 1	12726 1	61377 0	00006 1	12716 1	13103 1	31374 0	54003 0
05,2720	00006 1	31376 1	51377 0	52001 1	34755 1	55260 1	03105 0	44736 0
05,2730	70106 1	54106 1	33362 0	71035 1	64735 1	57035 0	33346 0	71277 0
05,2740	63361 0	55277 0	31321 0	54333 0	34750 1	00006 1	05014 1	40101 0
05,2750	74745 1	10000 0	12757 1	34737 0	00006 1	05011 1	12773 1	34736 1
05,2760	00006 1	05011 1	12773 1	00004 0	03114 0	12767 1	03144 0	03066 1
05,2770	43064 1	70106 1	54106 1	34756 1	54161 0	60000 1	00006 1	50000 1

OCTAL LISTING FOR PARAGRAPH # 146, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

05,3000	30752 1	00006 1	06001 0	10000 0	13052 1	13052 1	13052 1	10161 0
05,3010	12774 0	54162 0	5315 0	00004 0	44736 0	70075 1	54775 1	44740 1
05,3020	70075 1	54075 1	44741 0	70074 0	54074 0	34756 1	54161 0	60000 1
05,3030	50000 1	10752 0	13034 1	13041 0	54154 0	24154 1	24162 1	33000 1
05,3040	04622 0	10161 0	13026 1	10162 0	12637 0	34735 1	71010 0	00006 1
05,3050	16001 1	12637 0	05567 0	C: 01107 0	12477 0	C: 07777 1	C: 32321 0	C: 77445 1
05,3060	C: 03527 1	C: 21322 1	C: 77001 0	C: 00074 1	C: 20100 1	C: 03434 1	34747 1	00006 1
05,3070	02016 1	00006 1	13100 1	00006 1	00015 0	63357 0	00006 1	13101 0
05,3100	00002 0	03105 0	12472 0	02105 0	12477 0	33347 1	54335 0	34746 0
05,3110	00006 1	02033 0	63363 1	54110 0	34733 1	54026 1	67751 0	54027 0
05,3120	67752 0	54030 0	35015 0	54003 0	44737 1	71262 1	55262 1	34733 1
05,3130	55466 0	00006 1	03013 0	34755 1	55465 0	55472 0	44751 1	70111 1
05,3140	54111 1	00006 1	33345 0	53264 1	33356 1	00006 1	03011 1	44743 1
05,3150	70077 0	54077 0	40177 0	74741 0	00006 1	13157 0	34742 1	63352 0
05,3160	40000 0	70110 0	54110 0	33354 0	00006 1	03012 1	44750 0	70101 0
05,3170	54101 0	44741 0	70101 0	54101 0	33355 1	00006 1	03013 0	34740 0
05,3200	00006 1	05113 0	34746 0	00006 1	03014 1	35007 0	54003 0	34734 0
05,3210	55407 1	55406 0	55405 0	55404 0	55403 0	55402 1	55401 1	55400 0
05,3220	45236 1	55410 1	55412 0	55414 0	55416 1	55420 1	55422 0	55424 0
05,3230	55426 1	55430 0	45237 0	55411 0	55413 1	55415 1	55417 0	55421 0
05,3240	55423 1	55425 1	55427 0	55431 1	44755 0	54167 0	54203 1	54217 1
05,3250	54233 1	54247 1	54263 1	54277 1	54313 1	55310 0	54067 1	33351 0
05,3260	54400 1	63353 1	54454 0	63353 1	54530 0	63353 1	54604 1	63353 1
05,3270	54600 0	34363 0	54154 0	44740 1	50154 1	55022 1	10154 0	13272 1
05,3300	55323 0	55324 1	55325 0	55073 0	54045 1	54775 0	55041 1	55012 1
05,3310	55014 1	55011 1	55017 1	55020 0	55000 1	55001 0	55042 1	55307 0
05,3320	55043 0	55010 0	55302 0	55303 1	55304 0	55311 1	54100 1	34760 1
05,3330	55015 0	44753 0	55077 1	34746 0	71300 1	65026 0	55300 1	23350 1
05,3340	55361 0	4436 1	54776 0	00002 0	C: 02024 0	C: 34066 0	C: 00435 0	C: 03507 0
05,3350	C: 03357 0	C: 00400 0	C: 32001 1	C: 00054 0	C: 27470 1	C: 74160 0	C: 30001 0	C: 77755 0
05,3360	C: 37411 1	C: 27 0	C: 00450 0	C: 00102 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 02000 0
05,3370	C: 00000 1	C: 00000 1	C: 00000 1	C: 00100 0	C: 00000 1	C: 00000 1	C: 00000 1	C: 40000 0

OCTAL LISTING FOR PARAGRAPH # 047, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

05,3400	33473 0	54017 0	50017 1	13404 0	33464 1	60002 0	54001 1	40000 0
05,3410	52760 1	57002 0	33463 0	55010 0	55162 1	10002 1	40106 1	74737 1
05,3420	26116 1	43466 1	70111 1	54111 1	33467 1	55343 0	40101 0	74745 1
05,3430	26111 0	44355 1	00006 1	02011 0	64737 0	00006 1	01011 0	34735 1
05,3440	54177 0	40074 0	74752 1	26074 0	00006 1	30025 0	53342 1	00006 1
05,3450	33462 1	53252 1	02653 0	36250 0	54001 1	40000 0	52760 1	04635 0
05,3460	C: 12763 0	C: 13761 1	C: 64067 1	C: 00106 0	C: 00027 1	C: 00107 1	C: 40640 1	C: 00554 0
05,3470	C: 00017 1	C: 233 5 0	54016 1	00006 1	22012 1	34745 0	00006 1	02013 1
05,3500	10000 0	03335 1	06022 1	34745 0	00006 1	05013 0	00325 1	37752 0
05,3510	54336 0	54336 0	33637 0	54335 0	13530 0	03652 0	03652 0	C: 77753 0
05,3520	13521 0	10337 1	13665 0	C: 74001 0	30334 0	00006 1	63530 1	13535 0
05,3530	50333 1	32441 1	54334 1	40333 0	13754 0	50334 0	30000 1	10000 0
05,3540	24334 0	13545 1	56334 0	40000 0	56334 0	24000 1	54336 0	63517 1
05,3550	10000 0	13555 0	C: 47777 0	13555 0	03577 1	30336 1	63552 0	00006 1
05,3560	63652 0	67744 1	00006 1	63610 0	00006 1	50336 1	44000 1	54001 1
05,3570	00006 1	50336 1	43777 1	54336 0	37752 0	56336 1	13700 1	00006 1
05,3600	23265 1	22070 0	06022 1	22070 0	44745 1	00006 1	03013 0	01265 1
05,3610	50336 1	00000 1	10000 0	30336 1	13664 1	56336 1	54337 1	34755 1
05,3620	56336 1	54003 1	74357 0	00006 1	50000 1	31402 0	50336 1	52341 0
05,3630	24336 1	24336 1	24337 0	50337 0	00000 1	10000 0	13621 0	C: 03515 0
05,3640	54337 1	37752 0	54336 0	56337 0	54003 0	74357 0	00006 1	50000 1
05,3650	31402 0	13700 1	30336 1	54003 0	74357 0	54001 1	33523 0	26336 0
05,3660	00006 1	50001 0	31401 0	13700 1	54337 1	50337 0	00000 1	10000 0
05,3670	24337 0	13675 1	54337 1	37752 0	56337 0	24000 1	54336 0	13556 0
05,3700	00006 1	01034 1	30001 0	00006 1	01035 1	15270 0	34755 1	54336 0
05,3710	33751 1	33720 1	54335 0	30025 0	56751 0	30336 1	13700 1	C: 03721 0
05,3720	C: 03733 0	34752 0	26336 0	74357 0	10000 0	13725 1	30336 1	74737 1
05,3730	00006 1	1371 0	13507 1	33717 0	54335 0	30336 1	54003 0	74357 0
05,3740	54002 1	34754 0	54001 1	50002 0	71401 1	56001 0	50002 0	71400 0
05,3750	13700 1	00006 1	22335 1	35011 1	54001 1	03577 1	32665 0	56001 0
05,3760	13700 1	C: 30003 1	C: 00000 1	C: 22525 0	C: 12525 0	C: 22000 1	C: 00000 1	C: 01200 1
05,3770	C: 00000 1	C: 25252 0	C: 25253 1	C: 00027 1	C: 03774 0	C: 03775 1	C: 76220 0	a

OCTAL LISTING FOR PARAGRAPH # 053, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

06,2000	54016 1	00006 1	22012 1	11310 0	12010 0	12007 0	12134 1	34757 0
06,2010	54770 1	55310 0	11035 1	02063 0	02163 0	57035 0	74256 1	55035 1
06,2020	64111 0	00006 1	01010 1	02071 0	55115 0	44755 0	54073 1	56775 1
06,2030	64754 0	54775 0	50775 1	11022 1	10775 0	12030 1	12047 1	C: 00012 1
06,2040	12073 1	C: 37764 0	55015 0	00002 0	54073 1	32037 1	12031 0	64753 1
06,2050	50775 1	55022 1	74356 1	54073 1	34350 0	50775 1	74066 1	60073 0
06,2060	00006 1	01010 1	16742 1	10101 0	34755 1	12130 0	11015 0	02024 0
06,2070	12130 0	42171 0	27310 0	37734 0	54027 0	31300 1	00006 1	06032 0
06,2100	74736 0	00006 1	12116 1	23300 0	00006 1	06001 0	55300 1	74736 0
06,2110	10001 0	12116 1	34355 0	05072 1	C: 03506 1	C: 60101 1	50070 0	12120 1
06,2120	03164 1	13006 0	12172 0	13140 0	03164 1	13006 0	12172 0	13140 0
06,2130	00006 1	11010 1	32041 0	12074 1	34736 1	71310 0	00006 1	12165 0
06,2140	11015 0	02024 0	12152 1	44736 0	27310 0	37734 0	54027 0	34743 0
06,2150	27310 0	05270 1	00006 1	01010 1	37734 0	26027 0	34743 0	27310 0
06,2160	11310 0	05270 1	C: 37737 0	02154 1	05270 1	00006 1	01010 1	34736 1
06,2170	12144 0	C: 22400 0	31277 1	00006 1	06030 1	72761 1	00006 1	12227 0
06,2200	54170 1	23277 1	00006 1	06001 0	55277 0	44753 0	56070 0	00006 1
06,2210	62514 0	12213 1	64753 1	24070 0	60000 1	54000 0	12213 1	56071 1
06,2220	50070 0	34736 1	71277 0	50070 0	02755 1	10071 0	12212 0	41277 0
06,2230	74745 1	10000 0	12374 1	34744 1	71277 0	10000 0	12242 0	34744 1
06,2240	27277 0	12374 1	42777 0	71277 0	55277 0	74736 0	10000 0	12347 1
06,2250	41277 0	74743 1	10000 0	12256 0	05567 0	C: 00213 1	02735 1	33005 1
06,2260	05203 0	C: 02266 1	C: 14106 0	12374 1	33005 1	05224 0	44752 1	71277 0
06,2270	57277 1	74752 1	00006 1	12306 1	34726 1	71277 0	00006 1	12264 1
06,2300	40074 0	74744 0	10000 0	15261 0	04635 0	C: 17631 0	34735 1	00006 1
06,2310	05012 1	04674 0	C: 17260 0	05457 1	44763 0	00006 1	03012 1	34741 1
06,2320	05224 0	42774 0	71277 0	55277 0	44746 1	71300 1	55300 1	40076 1
06,2330	74735 0	00006 1	12336 1	26776 1	30025 0	57074 0	02703 1	44735 0
06,2340	00006 1	03012 1	35003 1	05203 0	C: 03246 1	C: 16103 1	15261 0	34750 1
06,2350	00076 1	02112 0	10000 0	12374 1	34744 1	70074 0	10000 0	12374 1
06,2360	02746 0	04674 0	C: 17260 0	34747 1	00006 1	05012 1	05457 1	34746 0
06,2370	05203 0	C: 02313 1	C: 14106 0	12374 1	31300 0	75026 1	54001 1	35026 0

DATA LISTING FOR PARAGRAPH # 051, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

06,2400	00006 1	03033 1	00006 1	06001 0	00006 1	12434 1	54070 1	23300 0
06,2410	00006 1	06001 0	55300 1	34755 1	56070 0	61000 1	12421 0	64753 1
06,2420	24071 0	61000 1	54000 0	12420 1	56071 1	50071 0	34737 0	71300 1
06,2430	50070 0	02763 1	10071 0	12417 0	10034 1	12441 0	12465 0	12441 0
06,2440	12465 0	62512 0	00006 1	62464 0	62512 1	00006 1	62462 0	34750 1
06,2450	00006 1	02012 0	10000 0	12462 1	04674 0	C: 17136 0	36245 1	05203 0
06,2460	C: 03132 1	C: 16103 1	34746 0	12465 0	34755 1	61035 0	74746 1	00006 1
06,2470	15270 0	71035 1	10000 0	12507 0	34746 0	71277 0	10000 0	15270 0
06,2500	41035 1	74746 1	64735 1	57025 0	72162 1	27035 1	15270 0	02766 1
06,2510	15270 0	12500 1	C: 63434 1	C: 75252 0	74723 0	54071 0	11277 0	12525 0
06,2520	12525 0	34750 1	00006 1	05011 1	12225 1	02766 1	12225 1	44750 0
06,2530	00006 1	03011 1	12225 1	34752 0	71277 0	10000 0	12225 1	34736 1
06,2540	71277 0	00006 1	12556 1	34735 1	00006 1	02012 0	00006 1	12551 0
06,2550	12225 1	34752 0	27277 0	05567 0	C: 00207 1	12225 1	41277 0	74745 1
06,2560	27277 0	32564 1	54111 0	12225 1	C: 00102 1	10000 0	12261 0	43002 1
06,2570	00006 1	03014 1	42776 1	00006 1	03012 1	44745 1	70101 0	54101 0
06,2600	44255 1	00006 1	02011 0	64736 1	00006 1	01011 0	02743 0	04674 0
06,2610	C: 17167 1	44755 0	54050 0	54051 1	54052 1	54047 0	43001 1	00006 1
06,2620	03014 1	12225 1	00006 1	12642 0	41300 1	74746 1	27300 1	04674 0
06,2630	C: 17167 1	42777 0	70074 0	56074 1	40000 0	74744 0	10000 0	12225 1
06,2640	05567 0	C: 02214 0	12225 1	34752 0	71277 0	10000 0	12225 1	12556 1
06,2650	10000 0	34742 1	57277 1	73004 1	27277 0	02703 1	41277 0	74753 0
06,2660	10000 0	12432 1	31277 1	73000 0	10000 0	12432 1	05567 0	C: 00212 0
06,2670	12432 1	10000 0	12432 1	05567 0	C: 01105 1	12432 1	10000 0	12432 1
06,2700	05567 0	C: 01106 1	12432 1	34761 0	71277 0	00006 1	74742 0	31277 1
06,2710	00006 1	04001 1	40000 0	75025 1	10000 0	12726 1	34753 1	71300 1
06,2720	10000 0	04002 0	44753 0	00006 1	03011 1	00002 0	00006 1	22066 1
06,2730	05734 1	34753 1	00006 1	05011 1	00006 1	43003 0	00006 1	03012 1
06,2740	34763 1	00006 1	05012 1	41035 1	72773 1	27035 1	41277 0	72775 1
06,2750	27277 0	41300 1	74746 1	27300 1	00002 0	12533 1	12703 0	12703 0
06,2760	12565 1	C: 76400 1	12622 1	12650 1	12671 1	12676 0	41300 1	74753 0
06,2770	10000 0	24002 0	00002 0	C: 40010 1	C: 00054 0	C: 00075 0	C: 00272 0	C: 00300 1

OCTAL LISTING FOR PARAGRAPH # 052, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

06,3000	C: 01720 0	C: 00740 1	C: 77000 1	C: 40040 1	C: 76777 1	C: 21450 0	30110 1	00006 1
06,3010	06033 1	74752 1	00006 1	13037 1	22110 1	00006 1	06001 0	73033 0
06,3020	54110 0	74752 1	10000 0	13034 1	37666 0	26110 0	34753 1	05203 0
06,3030	C: 32073 1	C: 52107 0	13126 0	C: 05776 1	44752 1	00006 1	03012 1	30110 1
06,3040	00006 1	06033 1	74745 1	00006 1	13071 0	34752 0	70110 0	10000 0
06,3050	13126 0	34745 0	22110 1	00006 1	06001 0	54110 0	30110 1	74615 0
06,3060	10000 0	13070 1	40074 0	74745 1	10000 0	13070 1	05567 0	C: 00515 0
06,3070	04564 1	30111 1	74753 0	10000 0	13126 0	40103 1	74747 0	10000 0
06,3100	13105 1	30102 1	74744 0	10000 0	13126 0	33135 0	70110 0	10000 0
06,3110	13126 0	04523 1	C: 00135 1	13115 0	13126 0	34741 1	26110 0	42126 1
06,3120	00006 1	03012 1	34752 0	05203 0	C: 02140 0	C: 52107 0	30110 1	74752 1
06,3130	10000 0	13132 0	00006 1	05012 1	13140 0	C: 32002 1	C: 20002 1	C: 02100 1
06,3140	30034 0	05023 1	55414 0	30034 0	05032 0	54061 1	30032 0	05032 1
06,3150	55417 0	41417 0	00006 1	70061 1	55416 1	30032 0	05032 0	55420 1
06,3160	00006 1	70061 1	55415 1	05270 0	44755 0	00006 1	06032 0	74257 0
06,3170	54002 1	41273 1	70002 1	54001 1	40002 1	71273 1	26001 1	00006 1
06,3200	15270 0	00006 1	74745 1	56001 0	24001 0	60000 1	54000 0	13204 0
06,3210	50001 0	34743 0	54002 1	71273 1	10000 0	13221 0	41257 1	50001 0
06,3220	73250 1	27257 1	41260 0	50001 0	73260 1	27260 0	30002 0	27273 1
06,3230	13244 1	50001 0	43250 1	71257 1	55257 1	50001 0	43260 1	71260 0
06,3240	55260 0	40002 1	71273 1	55273 1	37720 0	05072 1	C: 03644 1	C: 42106 0
06,3250	15270 0	C: 00040 0	C: 00020 0	C: 00100 0	C: 00200 0	C: 00010 0	C: 00001 0	C: 00004 0
06,3260	C: 00002 0	C: 00010 0	C: 00020 0	C: 00004 0	C: 00200 0	C: 00001 0	C: 00002 0	C: 00040 0
06,3270	C: 00100 0	33537 0	56003 1	54163 1	11477 0	13300 0	13300 0	13361 1
06,3300	34751 0	54132 0	50132 1	21453 1	00006 1	50132 1	70324 0	54002 1
06,3310	30001 0	00006 1	74746 1	50132 1	54325 1	30002 0	00006 1	74746 1
06,3320	50132 1	20325 1	50132 1	41452 1	00006 1	71074 1	00006 1	74746 1
06,3330	50132 1	20325 1	10132 0	67752 0	13301 1	12326 0	55477 0	54130 1
06,3340	03364 0	41460 0	03462 1	03401 1	41461 1	03462 1	03416 1	31462 0
06,3350	03462 1	11477 0	13354 1	13361 1	25021 0	05072 1	C: 03515 0	C: 14063 1
06,3360	00003 1	30163 0	54003 0	14631 0	00006 1	22106 0	00006 1	40225 1
06,3370	52155 1	31463 1	03433 0	00006 1	40327 0	52155 1	41466 0	03433 0

OCTAL LISTING FOR PARAGRAPH # 053, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "&" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

06,3400	00156 0	00006 1	22156 0	00006 1	40327 0	52155 1	31464 0	03423 0
06,3410	00076 1	40331 1	52155 1	41467 1	03433 0	00156 0	00006 1	22156 0
06,3420	00006 1	40327 0	52155 1	31470 0	03433 0	00006 1	40321 1	52155 1
06,3430	31465 1	03433 0	00156 0	56154 1	30006 1	70154 0	52123 0	30155 0
06,3440	00006 1	70154 0	54001 1	34755 1	20122 0	30122 0	00006 1	74743 1
06,3450	50130 0	21472 0	30123 1	00006 1	74743 1	54001 1	34755 1	50130 0
06,3460	21472 0	00012 0	00006 1	22131 1	00006 1	71074 1	22155 0	00006 1
06,3470	74750 0	50130 0	21472 0	30155 0	00006 1	74750 0	54001 1	34755 1
06,3500	50130 0	21472 0	34752 0	60130 0	56130 0	50000 1	11471 0	13511 0
06,3510	00131 1	73561 1	10100 0	55477 0	70131 1	34751 0	54130 1	50130 0
06,3520	31472 1	00006 1	74744 0	50130 0	55472 0	34755 1	50130 0	57471 1
06,3530	00006 1	74744 0	50130 0	21472 0	10130 1	67752 0	13516 1	C: 01471 1
06,3540	33537 0	4616 1	C: 17315 0	04616 1	C: 17710 1	15155 1	34751 0	54130 1
06,3550	50130 0	31472 1	00006 1	74744 0	50130 0	23472 1	10130 1	67752 0
06,3560	13547 0	C: 77776 1	15155 1	11477 0	13567 1	13567 1	15155 1	00004 0
06,3570	10076 1	15155 1	15155 1	13574 0	30104 1	74744 0	54141 1	00006 1
06,3600	13613 0	14674 0	C: 77541 1	30025 0	57074 0	00003 1	40000 0	61074 0
06,3610	64736 1	64736 1	56001 0	56001 0	00006 1	74742 0	52125 0	34755 1
06,3620	55477 0	54130 1	10141 1	03364 0	00006 1	30125 1	52155 1	41460 0
06,3630	03652 0	10141 1	03401 1	00006 1	40125 0	52155 1	31461 0	03652 0
06,3640	10141 1	03416 1	00006 1	40125 0	52155 1	41462 1	03652 0	11477 0
06,3650	13515 1	15155 1	56002 0	54131 0	30002 0	00006 1	70154 0	50130 0
06,3660	21472 0	30012 0	00006 1	70155 1	54001 1	34755 1	50130 0	21472 0
06,3670	13502 1	4616 1	C: 17271 0	11477 0	13677 0	13677 0	15155 1	30104 1
06,3700	74744 0	54141 1	37721 1	57074 0	40000 0	61234 0	13610 1	33537 0
06,3710	56002 1	54163 1	34755 1	55477 0	55471 0	55472 0	55473 1	55474 0
06,3720	55475 1	55476 1	13261 1	C: 20000 0	C: 00000 1	I: 53575 0	I: 77656 1	I: 72441 0
06,3730	C: 01742 1	I: 51136 1	C: 15736 1	I: 43215 0	C: 15724 1	C: 15724 1	C: 02253 1	I: 43414 1
06,3740	C: 02675 1	I: 53575 0	C: 02223 1	I: 77676 0	C: 00023 0	I: 53435 0	C: 02331 1	C: 00015 0
06,3750	I: 53435 0	C: 00023 0	C: 24007 0	C: 00001 0	I: 76521 0	C: 00007 0	C: 03434 1	I: 43414 1
06,3760	C: 02475 0	I: 57545 1	C: 01716 0	C: 14017 1	C: 01714 1	C: 14021 1	C: 24007 0	C: 24023 0
06,3770	C: 00017 1	I: 77616 0	C: 03772 0	C: 03773 1	CKSM 63375 0	a	a	a

OCTAL LISTING FOR PARAGRAH # 154, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DEACTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

07,2000	00014 0	113 7 3	2044 1	02006 0	05642 1	C: 20105 1	36245 1	71043 0
07,2010	10011 0	12044 1	34752 1	27042 0	10400 1	12031 0	10454 0	12031 0
07,2020	10530 0	12021 0	10604 1	12031 0	10660 0	12021 0	52134 0	05706 0
07,2030	C: 31217 0	64752 0	55307 0	34755 1	51307 1	53777 0	35025 0	05105 0
07,2040	C: 02062 0	C: 16067 1	01043 1	14631 0	52134 0	05706 0	C: 31211 1	34755 1
07,2050	57317 1	75074 1	10000 0	50000 1	54000 0	34753 1	04674 0	C: 17657 0
07,2060	34755 1	55043 0	06001 0	41307 0	74740 1	27307 0	32330 0	04616 1
07,2070	C: 20334 1	1206 1	12074 1	12063 1	37747 1	70734 0	00006 1	74743 1
07,2100	55551 0	00016 1	62063 0	65650 1	00006 1	12107 1	12123 1	32331 1
07,2110	04616 1	C: 20334 1	12060 1	12115 1	12107 1	00006 1	31345 1	50120 1
07,2120	52011 0	34755 1	12137 1	51551 1	31411 1	50120 1	54011 0	51551 1
07,2130	31403 1	50120 1	54011 1	31405 1	00006 1	50120 1	20010 1	50120 1
07,2140	54012 0	06042 1	I: 77624 1	C: 10520 1	I: 70535 0	C: 00013 0	I: 73406 1	I: 71525 0
07,2150	I: 74206 0	C: 00023 0	I: 74225 0	C: 00001 0	C: 00031 0	I: 45445 0	C: 63762 1	I: 65361 0
07,2160	C: 00031 0	I: 53361 0	C: 00023 0	I: 77626 0	C: 53754 1	C: 24007 0	C: 02715 0	I: 77776 1
07,2170	12202 1	I: 53133 0	C: 00004 0	C: 16177 1	I: 52145 0	C: 00021 0	C: 32011 0	I: 52175 0
07,2200	C: 03765 0	C: 32042 1	34755 1	55551 0	55550 1	35004 0	71307 0	55307 0
07,2210	32621 0	04616 1	C: 20345 1	12060 1	12216 1	12063 1	41307 0	74740 1
07,2220	27307 0	75004 1	55551 0	24755 1	55552 0	31307 1	75015 1	54001 1
07,2230	35015 0	00006 1	06001 0	00006 1	12241 0	11550 1	12240 1	12325 0
07,2240	55550 1	3474 0	27552 0	41550 1	00006 1	76245 0	41551 0	60001 0
07,2250	50120 1	54046 1	30120 1	54166 1	06042 1	I: 76614 0	C: 04307 1	C: 32000 0
07,2260	C: 00002 0	C: 24760 0	C: 00015 0	I: 77624 1	C: 47666 1	I: 76606 0	C: 00001 0	C: 24766 0
07,2270	C: 00023 0	I: 77624 1	C: 47666 1	I: 53435 0	I: 77626 0	C: 77746 1	I: 63325 1	C: 03553 1
07,2300	C: 00031 0	I: 70322 0	C: 00001 0	C: 14031 0	C: 00001 0	I: 56225 1	C: 16623 1	I: 53361 0
07,2310	C: 02715 0	C: 00031 0	C: 02715 0	C: 02767 0	I: 77776 1	11550 1	12240 1	34756 1
07,2320	00004 0	052 3	C: 02047 0	C: 16067 1	05472 0	05567 0	C: 00111 0	12202 1
07,2330	C: 00307 0	C: 01527 0	54016 1	20033 1	54063 0	20034 0	54064 1	30032 0
07,2340	54065 0	00006 1	30025 0	52062 1	56002 0	54012 0	22624 0	00006 1
07,2350	02016 1	10000 0	12354 0	12404 1	34740 0	71307 0	10000 0	05270 1
07,2360	11307 0	12365 1	05567 0	C: 00112 0	05270 1	34747 1	00006 1	02016 1
07,2370	10000 0	12461 1	34750 1	00006 1	02016 1	10000 0	12422 0	34751 0

OCTAL LISTING FOR PARAGRAPH # 055, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

07,2400	00006 1	02016 1	10000 0	12416 1	34776 0	00006 1	02016 1	00006 1
07,2410	12413 1	04635 0	C: 46455 1	05567 0	C: 07113 1	05270 1	34755 1	54070 1
07,2420	34742 1	12425 1	34753 1	54070 1	34741 1	55551 0	02514 0	12521 1
07,2430	34736 1	71307 0	00006 1	12444 0	41550 1	64751 0	00006 1	62454 0
07,2440	25550 0	47714 0	71307 0	55307 0	31551 1	71307 0	10000 0	12451 1
07,2450	12526 0	05567 0	C: 00114 0	05270 1	05567 0	C: 00107 1	02514 0	12627 1
07,2460	05270 1	02514 0	12507 0	35015 0	71307 0	10000 0	12472 0	05567 0
07,2470	C: 00115 1	05270 1	44355 1	71307 0	64737 0	57307 1	74737 1	10000 0
07,2500	12505 1	41551 0	71307 0	55307 0	12577 1	45015 1	12502 0	11550 1
07,2510	12512 1	12467 1	55550 1	05270 1	40104 0	74744 0	10000 0	24002 0
07,2520	00002 0	34755 1	54070 1	41307 0	75015 1	27307 0	35004 0	71307 0
07,2530	54071 1	00006 1	30062 0	53562 0	31550 0	00006 1	76245 0	56001 0
07,2540	60071 1	26070 1	55552 0	30063 1	50070 0	54000 0	30064 0	50070 0
07,2550	54002 1	30065 1	50070 0	54004 1	02514 0	12604 0	34737 0	61551 1
07,2560	40000 0	71307 0	61551 1	55307 0	75015 1	54001 1	35015 0	00006 1
07,2570	06001 0	10000 0	12577 1	41307 0	74736 0	27307 0	12577 1	35015 0
07,2600	71307 0	00006 1	74746 1	55552 0	35025 0	05072 1	C: 02611 0	C: 16067 1
07,2610	05270 1	02514 0	12627 1	51552 1	32616 1	02211 1	C: 15507 1	C: 15307 1
07,2620	C: 15107 0	C: 15507 1	C: 04000 0	C: 00000 1	C: 00034 0	C: 01507 1	C: 01517 0	32626 1
07,2630	04616 1	C: 20234 1	12060 1	12641 1	34746 0	70154 0	10000 0	12645 0
07,2640	12627 1	44736 0	71307 0	64736 1	55307 0	21225 1	51552 1	54001 1
07,2650	31237 0	51552 1	54003 0	41307 0	74736 0	00006 1	12216 1	31550 0
07,2660	64753 1	40000 0	64756 1	00006 1	62454 0	25550 0	12205 0	1: 77614 1
07,2670	C: 06466 0	1: 74045 0	C: 02355 0	C: 02303 0	1: 74325 0	C: 02361 1	C: 03726 1	1: 52455 0
07,2700	1: 45825 1	C: 03474 0	C: 13471 1	1: 52044 0	C: 61002 1	C: 71446 1	00004 0	41035 1
07,2710	74771 0	10000 0	12716 1	05567 0	C: 00206 0	13651 1	03645 0	41300 1
07,2720	74773 1	27307 1	41277 0	75741 1	27277 0	44771 0	00006 1	03012 1
07,2730	03260 0	34747 1	00006 1	05012 1	05457 1	34746 0	05203 0	C: 02751 0
07,2740	C: 16102 1	41277 0	74743 1	10000 0	12747 0	05567 0	C: 00210 1	00003 1
07,2750	14631 0	03633 1	05457 1	44747 0	00006 1	03012 1	34741 1	05224 0
07,2760	03633 1	45741 1	71277 0	55277 0	44773 1	71303 1	55300 1	04674 0
07,2770	C: 14703 0	13623 1	00004 0	03645 0	13126 0	36245 1	05203 0	C: 03002 0

OCTAL LISTING FOR PARAGRAPH # 154, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

07,3000	C: 16103 1	12747 0	03633 1	34746 1	00006 1	15012 1	34752 0	55474 0
07,3010	51474 1	31321 1	00006 1	51474 1	20032 1	00006 1	74737 1	56001 0
07,3020	60000 1	54001 1	13024 0	26001 1	51474 1	23471 1	11474 0	03007 0
07,3030	34752 0	05224 0	2623 1	54061 1	34752 0	55474 1	51474 1	11471 0
07,3040	03044 1	03053 1	03111 0	03053 1	63737 1	00006 1	63121 0	51474 1
07,3050	55471 0	43740 0	24061 0	64754 0	51474 1	54050 1	11474 0	03035 1
07,3060	11061 1	13125 0	05221 0	C: 00226 1	34752 0	54061 1	50000 1	30032 0
07,3070	00006 1	50061 1	20321 0	10000 0	12102 0	13077 0	13102 0	10061 1
07,3100	13065 0	13623 1	62110 1	00006 1	63077 1	05567 0	C: 00211 0	12631 1
07,3110	C: 77511 1	63737 1	70006 1	62121 0	40000 0	51474 1	55471 0	33740 1
07,3120	03052 0	34755 1	51474 1	57471 1	03052 0	27743 0	00006 1	05114 1
07,3130	33741 0	13031 1	34746 0	00006 1	05012 1	05261 1	34750 1	00006 1
07,3140	02012 0	10000 0	00002 0	44746 1	00006 1	63012 1	44742 0	00006 1
07,3150	03014 1	44755 0	54047 0	34750 1	00006 1	05012 1	41035 1	73201 0
07,3160	27035 1	41300 1	74746 1	27300 1	41277 0	74750 0	27277 0	44747 0
07,3170	70075 1	54075 1	44735 0	70076 1	54076 1	44737 1	70077 0	54077 0
07,3200	00032 0	C: 40010 1	00004 0	03645 0	43736 1	00006 1	03012 1	44746 1
07,3210	71300 1	55300 1	03260 0	34742 1	05202 0	C: 02226 1	C: 16103 1	35000 1
07,3220	05203 0	C: 02224 0	C: 16103 1	12747 0	03632 1	13623 1	03640 0	15261 0
07,3230	34750 1	00006 1	02012 0	10000 0	15261 0	41277 0	74737 1	27277 0
07,3240	44750 0	71277 0	55277 0	04674 0	C: 14703 0	15261 0	03640 0	15261 0
07,3250	41277 0	74742 0	27277 0	41300 1	74737 1	27300 1	44747 0	12241 1
07,3260	43201 0	71035 1	64735 1	55035 1	00002 0	44755 0	54037 1	54040 1
07,3270	54041 0	03640 0	14631 0	00004 0	44753 1	71277 0	55277 0	04674 0
07,3300	C: 14703 0	12747 0	00064 0	41277 0	74753 0	27277 0	74742 0	10000 0
07,3310	12747 0	05567 0	C: 00212 0	00004 0	13277 1	54161 0	03645 0	11311 1
07,3320	03361 0	54156 1	34746 0	00006 1	05014 1	34751 0	05203 0	C: 02377 1
07,3330	C: 16103 1	30161 1	56003 1	56161 1	55311 1	74357 0	54061 1	34752 0
07,3340	54157 0	60000 1	00061 0	54160 1	00006 1	50000 1	31401 0	52155 1
07,3350	07262 0	52155 1	50160 0	53401 1	10157 0	13340 1	30161 1	54003 0
07,3360	12747 0	00006 1	30134 1	52155 1	33376 0	15123 1	11311 1	13364 1
07,3370	54156 1	00006 1	30155 0	52134 0	34753 1	13326 1	C: 17366 1	43620 1

OCTAL LISTING FOR PARAGRAPH # 060, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

10,2000	I: 77160 0	C: 00002 0	C: 00003 1	I: 77614 1	C: 04343 1	C: 20011 0	I: 77160 0	C: 00012 1
10,2010	C: 00002 0	I: 66143 1	C: 10011 1	C: 02776 0	C: 22317 1	C: 10003 0	I: 54214 1	C: 04343 1
10,2020	C: 20022 0	C: 20367 1	C: 02321 0	I: 43134 0	C: 02777 1	C: 01271 1	I: 77650 1	C: 73515 1
10,2030	I: 77776 1	04616 1	C: 20036 0	06042 1	I: 77616 0	C: 02664 1	32035 0	54142 1
10,2040	56003 1	56142 0	74357 0	65007 0	54141 1	00006 1	30744 0	52155 1
10,2050	07106 1	C: 00745 1	52155 1	20001 1	50141 0	52001 1	00006 1	30740 1
10,2060	50141 0	52006 1	00006 1	40736 1	52155 1	07112 1	52155 1	20001 1
10,2070	50141 0	52006 1	00006 1	40742 1	52155 1	07112 1	52155 1	20001 1
10,2100	52160 1	00006 1	40742 1	52155 1	07106 1	C: 00737 1	00006 1	40155 1
10,2110	52162 0	07106 1	C: 00735 0	52155 1	20001 1	20001 1	52162 0	52155 1
10,2120	07106 1	C: 00743 1	52155 1	20001 1	20001 1	52131 0	00006 1	30744 0
10,2130	52155 1	07106 1	C: 00747 0	52155 1	20001 1	20162 0	00006 1	30736 0
10,2140	52155 1	07112 1	52155 1	20001 1	20131 0	52131 0	52155 1	00006 1
10,2150	30155 0	50141 0	52015 1	00006 1	30160 0	50141 0	52017 0	00006 1
10,2160	30162 1	50141 0	52021 0	30141 0	54116 0	00006 1	30006 1	64751 0
10,2170	52165 1	34744 1	54023 1	17463 0	52155 1	20001 1	50141 0	52007 1
10,2200	52160 1	20001 1	50141 0	52011 0	52162 0	20001 1	50141 0	52013 1
10,2210	30142 0	54003 0	14621 0	00004 0	52071 0	34355 0	05072 1	C: 03577 1
10,2220	C: 60102 1	52071 0	00003 1	52006 0	22073 0	30065 1	74757 1	60000 1
10,2230	54061 1	30065 1	75030 0	00006 1	74740 1	54062 1	30065 1	74101 1
10,2240	56065 1	75024 0	10000 0	15370 1	30062 0	50061 0	54750 1	10066 0
10,2250	12264 1	12252 1	40072 0	22072 1	50071 1	52750 1	10066 0	12260 1
10,2260	12264 1	40025 1	50071 1	55050 1	10065 0	12300 1	12303 1	40025 1
10,2270	50061 0	55050 1	30065 1	62276 0	10000 0	12276 1	C: 17777 0	12303 1
10,2300	00006 1	30025 0	53151 1	40062 1	50061 0	54747 1	30002 0	22073 0
10,2310	00003 1	52006 0	22073 0	30062 0	50061 0	54750 1	30070 0	50061 0
10,2320	55051 0	00006 1	30064 0	50061 0	53435 0	12247 0	05474 0	13422 1
10,2330	54155 1	34735 1	12501 0	34755 1	54155 1	33032 0	12501 0	54155 1
10,2340	33521 1	12501 0	54155 1	33506 1	12501 0	54155 1	33507 0	12501 0
10,2350	54155 1	34735 1	12454 1	54155 1	33032 0	12640 0	54155 1	33521 1
10,2360	12640 0	65023 0	54155 1	33506 1	12640 0	34753 1	02736 1	30100 0
10,2370	73522 0	10000 0	12430 0	30100 0	74742 1	00006 1	12400 0	15155 1

OCTAL LISTING FOR PARAGRAPH # 061, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

10,2400	00004 0	44756 0	70100 1	64753 1	54100 1	00003 1	41070 0	74747 0
10,2410	10000 0	12414 0	40270 1	54370 1	34752 1	12617 1	30165 0	54156 1
10,2420	50164 1	33532 0	54162 0	50164 1	31067 1	54160 1	54003 0	00002 0
10,2430	30100 0	73255 1	10000 0	13455 1	40100 1	74751 1	00004 0	26100 1
10,2440	12535 1	34370 0	74144 0	13121 1	54155 1	34755 1	12501 0	54155 1
10,2450	34746 0	12501 0	54155 1	34755 1	54160 1	34755 1	12642 1	34755 1
10,2460	54155 1	33505 1	12501 0	54155 1	33505 1	12640 0	54155 1	24736 1
10,2470	12501 0	54155 1	34736 1	12454 1	54155 1	22544 1	12501 0	54155 1
10,2500	34750 1	54160 1	02723 0	00003 1	12547 1	54155 1	33524 1	12640 0
10,2510	54155 1	33524 1	12501 0	34755 1	54164 0	03375 0	12523 0	30100 0
10,2520	73543 1	10000 0	12576 0	30100 0	75632 1	00006 1	12531 0	34755 1
10,2530	12775 1	34100 0	73541 0	00006 1	12537 0	34753 1	12775 1	02735 1
10,2540	03206 0	05137 1	03223 1	30025 0	55164 1	34755 1	12617 1	30167 1
10,2550	77730 0	54163 1	37724 1	05146 1	30160 0	73523 1	10000 0	12513 0
10,2560	12562 0	12365 1	34752 0	54164 0	03375 0	12600 1	41071 1	74750 0
10,2570	10000 0	12600 1	30100 0	73514 0	00006 1	12600 1	05624 1	C: 31502 1
10,2600	02737 0	30163 1	00006 1	04007 1	54366 0	30100 0	73515 1	10000 0
10,2610	12755 0	12613 0	12755 0	03206 0	05127 1	03223 1	34752 0	54164 0
10,2620	13071 0	54155 1	37737 0	12501 0	55044 1	33477 0	54155 1	33476 1
10,2630	12501 0	54155 1	33502 0	12501 0	02716 0	12501 0	54155 1	34750 1
10,2640	54160 1	36250 0	00004 0	54072 0	30167 1	77730 0	54063 0	30160 0
10,2650	74750 0	10000 0	12660 1	30063 1	05072 1	C: 02547 0	C: 20067 1	12666 1
10,2660	30006 1	10000 0	04007 1	54061 1	33540 0	05116 1	02723 0	00006 1
10,2670	30156 0	50064 0	52156 1	00006 1	30166 0	50064 0	52160 1	30064 0
10,2700	54161 0	02730 1	00003 1	14640 0	55044 1	33477 0	54155 1	33476 1
10,2710	12640 0	54155 1	33502 0	12640 0	02716 0	12640 0	55143 1	33503 1
10,2720	54155 1	33504 0	00002 0	00004 0	43512 1	70160 1	60003 1	54160 1
10,2730	22002 0	04645 1	54157 0	60072 1	00001 0	34755 1	54164 0	00004 0
10,2740	30160 0	50164 1	55067 0	73531 1	00006 1	12751 1	30157 1	50164 1
10,2750	54372 0	30155 0	50164 1	54367 1	13232 0	50164 1	33532 0	72761 1
10,2760	03545 0	C: 03004 0	44753 0	60164 1	54154 0	50154 1	33511 1	00004 0
10,2770	05137 1	03223 1	50154 1	33511 1	15133 1	54154 0	03206 0	05137 1

OCTAL LISTING FOR PARAGRAPH # 362, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

10,3000	30154 1	50064 1	54154 0	33016 0	03224 0	50154 1	33532 1	73535 0
10,3010	03555 1	C: 74 04	54154 1	24747 1	64751 0	03545 0	C: 02765 1	30100 0
10,3020	74751 1	10000 0	02470 1	12537 0	34755 1	54160 1	50160 0	33525 0
10,3030	64751 0	03555 1	C: 40010 1	50160 0	33511 1	00004 0	05137 1	12326 0
10,3040	31071 0	54003 0	30366 1	04727 1	77730 0	05146 1	46250 1	60374 1
10,3050	14640 0	00003 1	31072 0	54156 1	30100 0	77743 1	10000 0	13062 1
10,3060	13472 1	12400 0	05524 1	C: 60105 0	34736 1	70100 1	10000 0	12545 0
10,3070	12616 0	02420 0	30160 0	74757 1	54001 1	44727 1	50164 1	71067 0
10,3100	50164 1	55067 0	74744 0	54141 1	30156 0	54165 1	55072 1	50164 1
10,3110	10367 1	13120 0	13234 0	40370 1	54370 1	76077 0	63516 0	60141 0
10,3120	64753 1	04155 1	13246 0	04432 1	02416 0	05516 0	C: 00102 1	05516 0
10,3130	C: 00103 0	05516 0	C: 00104 1	30160 0	04255 1	13071 0	34747 1	70160 1
10,3140	10000 0	13164 0	34750 1	70160 1	10000 0	13261 0	40160 1	74746 1
10,3150	10000 0	13156 1	50164 1	30372 1	54157 0	13354 1	50164 1	30367 0
10,3160	76077 0	00006 1	13261 0	15155 1	30160 0	74737 1	10000 0	13142 1
10,3170	34737 0	50164 1	27067 0	22007 0	00006 1	62441 1	74740 1	00006 1
10,3200	13204 0	41066 1	63542 1	13121 1	33501 0	13121 1	44747 0	00006 1
10,3210	03011 1	30100 0	73517 0	10000 0	34752 1	54001 1	34755 1	50001 0
10,3220	57041 0	00004 0	00002 0	34217 1	56064 0	00006 1	63232 1	56064 0
10,3230	50064 0	54164 0	00003 1	00002 0	37723 0	05105 0	C: 04231 0	C: 04060 0
10,3240	13262 0	30100 0	73267 0	00006 1	12576 0	15155 1	11041 1	15155 1
10,3250	13252 0	15155 1	30162 1	73520 1	03545 1	C: 24100 0	50164 1	33510 0
10,3260	04442 1	04427 1	30164 1	54157 0	30162 1	73011 0	03545 0	C: 40040 0
10,3270	31073 1	50164 1	74751 1	10000 0	13361 1	11041 1	13241 1	13301 1
10,3300	13241 1	04207 0	13373 1	13412 1	43527 0	60154 1	00006 1	26000 0
10,3310	00006 1	13462 0	34752 0	54161 0	30100 0	74101 1	10000 0	13322 0
10,3320	13420 1	13414 1	40125 1	61164 0	10000 0	40000 0	67734 0	64753 1
10,3330	63571 1	00006 1	62545 1	13430 1	34753 1	13025 1	10161 0	64753 1
10,3340	13342 0	15155 1	50157 1	60372 1	54157 0	30162 1	73350 0	03555 1
10,3350	C: 74044 1	46250 1	04154 0	13354 1	30163 0	77720 0	05146 1	30157 1
10,3360	14640 0	50164 1	44751 1	71073 0	55072 0	34755 1	04727 1	36250 0
10,3370	50164 1	61372 1	14640 0	34755 1	13313 1	40160 1	74736 0	10000 0

OCTAL LISTING FOR PARAGRAPH # 063, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

10,3400	16742 1	40157 0	59154 1	60372 1	00006 1	13407 0	00002 0	11011 1
10,3410	05155 0	10012 0	34753 1	13313 1	46245 0	79193 1	00004 0	54100 1
10,3420	00003 1	13336 0	37752 0	54161 0	30100 0	74255 1	10000 0	13062 1
10,3430	30190 0	73525 1	10000 0	13024 0	30100 0	73526 1	10000 0	13334 1
10,3440	31071 0	74771 0	10000 0	13336 0	30371 1	00006 1	13336 0	35025 0
10,3450	00004 0	05072 1	C: 02616 1	C: 20060 0	13336 0	30100 0	73525 1	10000 0
10,3460	15155 1	13755 0	50157 1	30367 0	76077 1	40000 0	60155 0	00006 1
10,3470	13312 0	13051 1	46250 1	04154 0	15155 1		C: 00026 1	C: 00231 1
10,3500	C: 01437 0	C: 144 1	C: 00130 1	C: 01006 0	C: 00014 1	C: 20010 1	C: 40230 1	C: 40036 0
10,3510	C: 20543 1	C: 20400 1	C: 20616 1	C: 03400 0	C: 11210 1	C: 66521 1	C: 01177 1	C: 00700 0
10,3520	C: 00704 1	C: 40030 0	C: 34300 0	C: 40100 1	C: 00110 1	C: 02020 1	C: 01010 1	C: 00026 0
10,3530	C: 77730 0	C: 00050 1	C: 20144 1	C: 42424 0	C: 11254 1	C: 74704 1	C: 67777 1	C: 40420 0
10,3540	C: 02547 0	C: 10211 1	C: 30200 0	C: 20100 1	C: 24030 1	00004 0	75650 0	54001 1
10,3550	40100 1	70111 1	26100 1	00003 1	16742 1	00004 0	75650 0	40000 0
10,3560	70100 1	54111 1	13553 0	00004 0	54001 1	30133 0	55363 1	30134 1
10,3570	05576 0	C: 77467 1	35006 1	12505 1	00006 1	30025 0	16060 0	10154 0
10,3600	34755 1	13614 1	13603 0	44736 0	54155 1	34755 1	56154 1	00006 1
10,3610	74736 0	20155 1	16064 1	07262 0	16164 1	03645 0	34755 1	54155 1
10,3620	16063 0	03645 0	52162 0	52155 1	03645 0	54156 1	52160 1	52155 1
10,3630	03645 0	54155 1	30161 1	54154 0	34753 1	16063 0	03645 0	52160 1
10,3640	52155 1	03645 0	54001 1	30157 1	16060 0	52155 1	20001 1	10000 0
10,3650	64753 1	13653 0	40000 0	54154 0	00002 0	50000 1	34734 0	26154 0
10,3660	00002 0	54142 1	50130 0	10000 0	64753 1	13671 0	64753 1	64753 1
10,3670	40000 0	60142 0	10000 0	64753 1	13676 1	40000 0	54142 1	13703 1
10,3700	50000 1	34734 0	60142 0	50130 0	54000 0	00002 0	50120 1	30046 0
10,3710	04616 1	C: 17315 0	16064 1	00006 1	34733 1	52155 1	10000 0	34755 1
10,3720	16162 1	13722 1	00006 1	44733 0	16060 0	34753 1	13720 1	34755 1
10,3730	60120 1	54056 1	04616 1	C: 01010 1	10154 0	13771 1	13740 0	13771 1
10,3740	10157 0	13771 1	13744 1	13771 1	10161 0	13771 1	13750 1	13771 1
10,3750	30155 0	00016 1	74736 0	20155 1	30160 0	00006 1	74736 0	20160 1
10,3760	30162 1	00016 1	74736 0	20162 0	34761 0	50156 0	54045 1	04635 0
10,3770	C: 01024 0	34755 1	13765 1	04616 1	C: 01010 1	06064 0	C: 03776 1	CKSM 44507 0

OCTAL LISTING FOR PARAGRAPH # 064, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

11,2000	I: 77614 1	C: 03475 1	I: 44175 1	C: 03444 0	C: 03462 0	C: 03472 0	I: 77646 0	C: 03723 1
11,2010	I: 46135 1	C: 03000 1	C: 22026 0	I: 72575 0	C: 02323 1	C: 26323 1	C: 02331 1	I: 77752 1
11,2020	C: 26331 1	C: 03472 1	I: 77752 1	C: 03472 0	I: 77646 0	C: 03723 1	I: 71331 0	C: 03617 1
11,2030	C: 77776 1	I: 70546 1	C: 17667 0	I: 67154 0	C: 00154 1	C: 02701 0	I: 77775 1	C: 02323 1
11,2040	C: 26655 1	C: 03472 1	C: 16663 1	C: 03452 1	C: 02671 0	I: 77261 1	C: 00001 0	C: 02323 1
11,2050	I: 41456 0	I: 53435 0	C: 02331 1	C: 26674 0	C: 03472 0	I: 50256 0	I: 43015 1	C: 03667 0
11,2060	C: 03665 1	C: 03667 1	I: 43044 0	C: 22105 0	C: 03465 0	I: 41575 0	C: 02663 0	I: 63246 1
11,2070	I: 46216 1	C: 02674 0	I: 51352 1	I: 74256 0	I: 77772 0	C: 02663 0	I: 67351 1	C: 24007 0
11,2100	C: 03617 1	I: 77244 0	C: 22105 0	C: 02663 0	C: 03472 0	I: 63345 0	C: 26007 1	C: 02663 0
11,2110	I: 63256 0	C: 02655 0	I: 41456 0	I: 57435 1	C: 00003 1	I: 77606 1	I: 71350 1	C: 02776 0
11,2120	C: 00023 0	I: 62040 1	C: 22124 0	C: 77767 1	I: 67310 1	C: 00012 1	C: 00047 1	I: 77230 0
11,2130	C: 22132 1	I: 41476 1	I: 77775 1	I: 50235 0	I: 71244 0	C: 22137 1	I: 41476 1	I: 67154 0
11,2140	C: 00000 1	C: 02672 0	I: 66350 1	C: 02776 0	C: 00027 1	C: 00024 1	I: 77624 1	C: 25212 1
11,2150	I: 77214 0	C: 03675 0	C: 02744 1	C: 16337 1	C: 02702 0	I: 45020 0	C: 22233 0	C: 27412 0
11,2160	I: 43135 1	C: 03001 1	C: 00263 1	I: 43030 0	C: 22166 0	C: 00063 1	I: 77775 1	C: 02323 1
11,2170	C: 02655 0	C: 25535 0	C: 02337 1	C: 15542 1	C: 03610 0	C: 01517 0	I: 43015 1	C: 03452 1
11,2200	C: 01672 1	C: 34041 0	C: 27110 1	I: 77775 1	C: 00025 0	C: 02703 1	I: 63154 1	C: 03616 0
11,2210	C: 00001 0	I: 55134 1	C: 03616 0	C: 02701 0	I: 46135 1	C: 00050 1	C: 22230 0	I: 52375 1
11,2220	C: 03472 0	C: 00017 1	I: 77655 1	C: 02663 0	C: 16663 0	C: 03667 0	I: 77650 1	C: 22062 0
11,2230	I: 77775 1	C: 02663 0	C: 03472 0	I: 52375 1	C: 02337 1	C: 02331 1	C: 26366 0	C: 02702 1
11,2240	C: 03566 1	I: 46135 1	C: 03000 1	C: 22260 0	I: 70575 1	C: 03566 1	C: 27566 1	C: 02337 1
11,2250	I: 77742 0	C: 26337 1	C: 03472 0	I: 77742 0	C: 27472 0	C: 02366 0	I: 77742 0	C: 02366 0
11,2260	I: 77750 1	C: 02776 0	C: 10063 0	I: 41266 0	C: 02742 1	I: 56342 1	C: 00041 1	C: 17721 0
11,2270	I: 77661 0	C: 21607 1	C: 03717 0	I: 77201 1	C: 00001 0	C: 03472 0	C: 03444 0	I: 52014 0
11,2300	C: 01267 0	C: 03463 0	56016 0	00006 1	22012 1	05221 1	C: 00100 0	15270 0
11,2310	01016 1	01021 0	40250 0	72411 1	55444 0	34752 0	55443 1	34756 1
11,2320	05173 1	C: 02325 1	15270 0	55443 1	34757 0	05224 0	00006 1	00031 0
11,2330	40600 0	77411 1	57444 1	54701 1	11444 0	12324 1	10001 1	12347 1
11,2340	11443 1	12323 0	06022 1	34740 0	00006 1	05013 0	15261 0	34737 0
11,2350	00006 1	02131 1	00006 1	12342 1	30001 0	74746 1	10000 0	42402 1
11,2360	27445 1	21001 1	74747 0	10000 0	32402 0	27445 1	30001 0	74753 0
11,2370	11000 0	42403 0	27445 1	30001 0	74752 1	10000 0	32403 1	27446 1

OCTAL LISTING FOR PARAGRAPH # 065, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

11,2400		12342 1	C: 00163 1	C: 01074 0	C: 00217 0	I: 40354 1	C: 02030 0	C: 00001 0	I: 75543 1
11,2410	C: 51770 0	I: 53515 0	C: 01535 0	I: 60325 0	C: 00045 0	C: 00047 1	I: 77715 1	I: 65241 0	
11,2420	C: 01543 1	C: 02074 0	I: 60225 1	C: 01551 1	C: 00051 0	I: 77742 0	I: 65271 0	C: 00003 1	
11,2430	I: 41405 0	C: 00005 1	I: 65316 0	C: 00005 1	I: 64716 0	C: 51770 0	I: 40442 1	I: 47515 0	
11,2440	C: 01543 1	I: 44205 1	C: 00045 0	I: 41271 0	C: 00003 1	I: 53605 1	C: 13772 1	C: 20176 0	
11,2450	I: 43260 1	C: 00050 1	I: 45257 0	C: 20211 1	I: 41205 0	C: 00001 0	C: 00005 1	I: 53657 0	
11,2460	C: 20211 1	C: 20211 0	I: 65215 1	C: 01553 0	I: 53605 1	C: 00001 0	C: 20202 0	I: 42204 0	
11,2470	C: 57753 1	I: 77626 0	C: 75647 0	I: 74020 0	C: 02112 1	C: 00012 1	I: 74014 1	C: 00203 1	
11,2500	C: 24023 0	C: 00002 0	I: 77650 1	C: 24023 0	I: 66250 1	C: 01500 0	C: 00051 0	C: 77762 1	
11,2510	I: 54345 1	C: 00076 1	C: 20612 0	I: 61500 0	C: 22515 0	I: 43206 1	C: 01551 1	C: 16074 0	
11,2520	I: 77615 0	C: 01517 0	C: 35517 1	C: 22404 1	I: 73150 1	C: 02030 0	C: 02030 0	I: 77775 1	
11,2530	C: 24007 0	C: 26062 1	C: 02032 1	I: 53257 1	C: 57605 0	C: 01535 0	C: 02040 1	I: 65014 1	
11,2540	C: 01756 1	C: 22546 0	C: 01500 0	C: 12132 1	I: 77724 0	C: 01500 0	I: 53575 0	C: 02032 1	
11,2550	C: 16032 1	C: 00045 0	C: 36070 0	C: 22655 1	I: 66175 1	C: 02040 1	C: 00051 0	C: 16032 1	
11,2560	C: 02172 0	C: 02070 1	I: 71214 0	C: 00342 1	C: 23026 1	C: 01517 0	I: 77624 1	C: 33647 1	
11,2570	I: 72174 0	C: 00002 0	C: 00051 0	I: 77614 1	C: 00342 0	C: 22600 1	I: 77076 0	C: 00000 1	
11,2600	C: 72040 1	C: 26105 1	C: 00003 1	C: 02122 1	I: 45335 0	C: 01011 0	C: 13774 1	I: 43030 0	
11,2610	C: 22613 0	C: 01756 1	C: 22627 1	I: 74375 0	C: 02032 1	C: 02071 1	I: 52257 0	C: 57175 0	
11,2620	C: 02040 1	I: 77724 0	C: 01500 0	C: 12140 1	C: 02114 1	I: 77724 0	C: 01500 0	I: 62175 0	
11,2630	C: 02105 1	C: 00004 0	I: 43014 0	C: 04260 1	C: 00343 0	C: 22642 1	I: 53261 1	C: 20612 0	
11,2640	C: 02122 1	C: 02122 1	I: 77624 1	C: 22655 1	I: 62174 1	C: 00004 0	C: 00004 0	I: 77775 1	
11,2650	C: 02122 1	C: 36000 0	C: 22655 1	I: 77650 1	C: 23026 1	I: 74575 0	C: 02040 1	I: 40236 1	
11,2660	C: 00001 0	I: 61501 1	C: 00040 0	I: 60325 0	C: 02070 1	C: 00041 1	I: 63342 1	C: 02040 1	
11,2670	I: 77656 1	C: 15040 1	C: 00045 0	C: 02072 0	I: 55301 0	C: 00042 1	I: 41562 0	I: 77743 1	
11,2700	C: 27733 0	C: 00051 0	I: 57124 1	C: 00050 1	C: 00040 0	I: 71264 1	C: 00041 1	C: 00003 1	
11,2710	I: 65357 0	C: 57177 1	C: 20050 1	I: 74406 0	I: 50315 0	C: 02032 1	C: 02040 1	I: 44372 1	
11,2720	I: 57206 1	C: 00005 1	I: 77521 1	I: 43206 1	C: 25766 1	I: 75406 1	I: 41475 1	C: 00013 0	
11,2730	I: 43352 1	C: 25766 1	I: 43325 1	C: 00013 0	C: 24005 1	I: 72475 1	C: 00011 1	I: 56215 1	
11,2740	C: 25760 1	C: 00017 1	I: 74275 1	C: 00007 0	C: 02040 1	I: 64515 1	C: 02022 1	I: 41455 0	
11,2750	I: 41345 0	C: 00001 0	C: 00015 0	I: 61501 1	C: 00037 0	I: 40665 0	C: 00003 1	C: 51770 0	
11,2760	I: 74276 1	I: 57124 1	C: 00050 1	C: 00051 0	I: 55664 0	C: 00036 1	C: 00037 0	I: 53604 0	
11,2770	C: 57753 1	C: 57177 1	I: 53324 1	C: 00050 1	C: 02062 1	C: 02062 1	I: 43400 1	C: 23000 0	

OCTAL LISTING FOR PARAGRAPH # 166, WITH PARITY BIT IN PINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

11,3000	I: 51575 1	C: 01521 1	I: 77654 0	C: 23023 1	I: 54345 1	C: 02100 1	C: 20612 0	I: 44206 0
11,3010	C: 01551 1	C: 16074 0	C: 01517 0	I: 45425 0	C: 42260 0	C: 22404 1	I: 77624 1	C: 27673 0
11,3020	I: 77614 1	C: 04121 1	C: 27260 0	I: 77776 1	05642 1	C: 20430 1	I: 71354 0	C: 02030 0
11,3030	C: 02070 1	I: 44621 1	C: 00001 0	C: 50130 1	I: 43044 0	C: 23264 0	C: 00343 0	C: 23273 0
11,3040	I: 65375 0	C: 02122 1	C: 01517 0	I: 45125 0	C: 25756 1	C: 51677 0	C: 24017 1	C: 24001 0
11,3050	I: 45006 0	C: 23301 1	I: 77715 1	C: 24005 1	I: 45006 0	C: 23301 1	I: 77772 0	C: 24041 1
11,3060	I: 77772 0	C: 14025 0	C: 00023 0	I: 65275 1	C: 25770 0	C: 00023 0	I: 57316 1	C: 25772 1
11,3070	I: 41425 1	C: 25764 0	I: 41275 1	C: 00023 0	C: 13764 0	I: 65272 1	C: 00001 0	I: 44275 1
11,3100	C: 13772 1	I: 57206 1	C: 00023 0	I: 65275 1	C: 13766 1	C: 00003 1	I: 44275 1	C: 13770 0
11,3110	I: 56203 0	C: 51704 0	C: 25770 1	I: 56615 0	C: 00005 1	C: 51761 1	I: 43271 1	C: 02070 1
11,3120	C: 00003 1	I: 77761 1	C: 02132 1	C: 14032 1	I: 70402 1	C: 51764 0	I: 43271 1	C: 02070 1
11,3130	I: 50473 1	C: 51761 1	I: 43271 1	C: 02070 1	I: 76561 1	C: 00025 0	I: 77645 0	C: 00023 1
11,3140	C: 14033 1	C: 02071 1	I: 63501 0	C: 02047 1	I: 60316 0	C: 00051 0	I: 54606 0	C: 51754 0
11,3150	I: 40161 0	C: 00033 1	C: 23153 1	I: 56070 0	C: 00046 0	C: 00046 0	I: 53670 0	C: 00050 1
11,3160	C: 20153 1	I: 40055 0	C: 02062 1	C: 23000 0	C: 16062 1	C: 00017 1	I: 41414 0	C: 00343 0
11,3170	C: 23264 0	I: 65316 0	C: 00021 1	I: 45316 1	I: 74205 0	C: 27735 0	C: 02032 1	I: 65332 0
11,3200	I: 53361 0	C: 00041 1	I: 47315 0	C: 00041 1	C: 00025 0	I: 74372 1	C: 00021 1	I: 41455 0
11,3210	I: 77745 1	C: 00025 0	I: 41516 0	I: 65205 0	C: 27735 0	I: 43302 1	C: 00011 1	I: 41221 0
11,3220	C: 11025 0	C: 00017 1	I: 74205 0	C: 27735 0	C: 02032 1	I: 65272 0	I: 74225 1	C: 11025 0
11,3230	C: 00041 1	I: 53372 1	I: 41325 0	C: 00017 1	C: 00023 0	I: 74205 0	C: 27735 0	C: 00025 0
11,3240	I: 53352 0	I: 63325 0	C: 02370 1	C: 00050 1	I: 67206 1	C: 01351 1	I: 74271 0	I: 63257 1
11,3250	C: 57611 1	I: 67206 1	C: 01350 0	I: 53361 0	I: 71257 0	C: 20146 0	I: 40055 0	C: 02062 1
11,3260	C: 23000 0	C: 02062 1	I: 77754 1	C: 02030 0	I: 72135 0	C: 01501 1	C: 00154 1	I: 73205 1
11,3270	C: 27737 1	C: 00155 0	C: 23376 0	I: 77745 1	C: 02036 0	C: 24023 0	C: 24001 0	I: 77650 1
11,3300	C: 23061 1	I: 57435 1	C: 02013 1	I: 77655 1	I: 43505 0	C: 00025 0	C: 23475 0	C: 23501 1
11,3310	C: 23512 0	I: 77914 0	C: 02342 1	C: 23342 0	C: 01535 0	I: 41241 0	C: 01543 1	C: 02076 1
11,3320	I: 7764 0	C: 23242 0	I: 43014 0	C: 00303 1	C: 23417 1	C: 04340 0	C: 23414 1	I: 45145 0
11,3330	C: 01517 0	C: 23647 1	C: 02105 1	I: 77754 1	C: 02030 0	I: 51445 0	C: 01535 0	I: 50025 0
11,3340	C: 27743 1	C: 23434 0	I: 51575 1	C: 01521 0	I: 77600 1	C: 23370 1	I: 51025 1	C: 13762 0
11,3350	C: 23370 1	I: 53615 0	C: 13762 0	C: 57605 0	I: 45271 1	C: 00030 0	C: 27741 0	I: 77244 0
11,3360	C: 23370 1	C: 01527 0	I: 45246 0	C: 13762 0	I: 77600 1	C: 23370 1	I: 77640 0	C: 23372 0
11,3370	I: 77624 1	C: 27673 0	I: 77775 1	C: 01527 0	C: 25134 0	C: 01521 0	C: 01126 0	I: 77614 1

OCTAL LISTING FOR PARAGRAPH # 067, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

11,3400	C: 00251 1	I: 66375 0	C: 01126 0	C: 01501 1	C: 00000 1	C: 16032 1	C: 24007 0	C: 02100 1
11,3410	I: 52014 0	C: 003 1 0	C: 23714 1	C: 22524 1	I: 52175 0	C: 02105 1	C: 23335 0	I: 60545 0
11,3420	C: 00013 0	I: 50025 0	C: 27743 1	C: 23342 0	I: 71214 0	C: 04340 1	C: 23434 0	C: 01517 0
11,3430	I: 77624 1	C: 33647 1	I: 77675 0	C: 02105 1	I: 77624 1	C: 23440 0	I: 77650 1	C: 23372 0
11,3440	I: 45024 1	C: 02112 1	C: 27673 0	I: 53775 1	C: 01535 0	C: 57576 1	I: 53651 0	C: 02105 1
11,3450	C: 57574 0	C: 01503 0	C: 01535 0	I: 57414 1	C: 00343 0	C: 23456 1	I: 53715 1	C: 01543 1
11,3460	C: 57576 1	I: 77651 0	I: 77657 0	C: 57574 0	C: 01511 0	C: 01543 1	I: 67154 0	C: 02112 1
11,3470	C: 00052 0	I: 52014 0	C: 00303 1	C: 26712 1	C: 26717 1	I: 64575 1	C: 02062 1	C: 36046 0
11,3500	C: 23655 0	I: 74575 0	C: 02062 1	I: 53206 0	C: 02046 1	C: 26054 1	I: 53362 0	C: 02046 1
11,3510	C: 36046 0	C: 23655 0	I: 57345 1	C: 02100 1	C: 13772 1	I: 74206 0	C: 02046 1	I: 53372 1
11,3520	C: 01134 0	I: 53361 1	C: 02100 1	C: 01126 0	C: 25126 0	C: 02062 1	I: 53322 1	C: 02054 1
11,3530	I: 76561 1	I: 77655 1	C: 01134 0	C: 01134 0	I: 45014 0	C: 00341 1	C: 23606 0	C: 11226 1
11,3540	I: 77354 0	C: 01116 0	C: 01134 0	I: 77732 1	C: 12467 1	I: 77775 1	C: 01126 0	I: 40132 0
11,3550	C: 23700 1	C: 12401 1	I: 77624 1	C: 11226 1	I: 66354 0	C: 01116 0	C: 00052 0	C: 00000 1
11,3560	I: 67114 1	C: 00006 1	C: 01125 0	I: 45104 0	C: 23651 1	C: 11226 1	I: 67154 0	C: 01125 0
11,3570	C: 01116 0	I: 77624 1	C: 11226 1	I: 76754 0	C: 01116 0	C: 75376 1	I: 77722 0	C: 01126 0
11,3600	I: 76173 0	C: 75310 1	C: 00000 1	I: 77722 0	C: 35124 1	C: 23401 0	I: 77200 0	C: 23000 0
11,3610	C: 01134 0	C: 25527 1	C: 01126 0	C: 01521 0	I: 43014 0	C: 04715 0	C: 27621 0	C: 01756 1
11,3620	C: 27620 0	I: 77776 1	05353 1	C: 04022 0	05504 0	C: 00236 0	06042 1	I: 77731 1
11,3630	C: 00053 1	C: 23636 0	I: 52014 0	C: 01714 1	C: 26662 1	C: 26735 1	I: 66214 0	C: 00061 0
11,3640	C: 01117 1	C: 77741 0	I: 66214 0	C: 01755 1	C: 23571 0	C: 01117 1	C: 77717 0	I: 77650 1
11,3650	C: 23571 0	I: 77745 1	C: 01115 0	C: 34041 0	C: 27142 0	I: 43345 1	C: 02076 1	C: 02100 1
11,3660	I: 66110 1	C: 77762 0	C: 01500 0	C: 02100 1	I: 74561 0	C: 02062 1	I: 74255 0	C: 01134 0
11,3670	C: 02100 1	I: 77655 1	C: 01126 0	C: 02032 1	I: 52014 0	C: 00301 0	C: 23714 1	C: 22504 0
11,3700	I: 43014 0	C: 01676 1	C: 01671 0	I: 77614 1	C: 02676 1	I: 77414 0	C: 01472 1	05567 0
11,3710	C: 00421 0	06042 1	I: 77650 1	C: 27260 0	I: 70754 0	C: 02030 0	C: 51770 0	C: 36072 1
11,3720	C: 23742 1	C: 02062 1	I: 62014 0	C: 00342 1	C: 23264 0	C: 77771 0	I: 76744 1	C: 02030 0
11,3730	C: 51772 1	C: 36072 1	C: 23742 1	I: 50414 0	C: 00303 1	C: 23736 1	I: 77655 1	C: 02062 1
11,3740	C: 36062 0	C: 23264 0	I: 60575 0	C: 02032 1	I: 53512 0	C: 02132 0	I: 46315 1	C: 02032 1
11,3750	I: 52361 1	C: 13762 0	I: 60325 0	C: 00045 0	C: 00052 0	I: 63406 0	I: 77605 1	I: 65301 0
11,3760	C: 00043 0	C: 02072 0	I: 56342 1	I: 77761 1	I: 57154 0	C: 00051 0	C: 00051 0	I: 57074 0
11,3770	C: 00051 0	C: 00042 1	I: 43457 0	C: 57606 0	C: 03774 0	C: 03775 1	CKSM 12143 1	a

OCTAL LISTING FOR PARAGRAPH # 070, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

12,2000	C: 00000 1	C: 00011 1	C: 00000 1	C: 00000 1	C: 20000 0	C: 00000 1	C: 00000 1	C: 00000 1
12,2010	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 77777 0	C: 77771 0	C: 77762 0	C: 37777 1
12,2020	C: 37777 1	C: 37777 1	C: 37777 1	I: 40001 0	C: 00001 0	C: 24026 0	I: 77773 1	C: 10005 0
12,2030	C: 24017 1	C: 01503 0	I: 66256 0	C: 00027 1	C: 00024 1	C: 16647 0	C: 00045 0	C: 24041 1
12,2040	C: 01503 0	I: 76441 1	C: 01511 0	I: 76405 1	C: 00023 0	C: 24043 0	C: 01511 0	I: 57236 1
12,2050	C: 00017 1	I: 52405 1	C: 00041 1	I: 61425 0	C: 11017 1	C: 00045 0	I: 74421 0	C: 11017 1
12,2060	I: 77671 1	C: 00041 1	C: 00011 1	I: 71244 0	C: 24073 0	C: 11035 1	I: 40071 0	C: 00011 1
12,2070	C: 24077 1	I: 52166 1	C: 24077 1	I: 55366 1	C: 11037 0	I: 77600 1	C: 24077 1	C: 00013 0
12,2100	I: 65205 0	C: 00023 0	C: 00011 1	I: 65301 0	C: 00047 1	I: 56257 1	C: 20173 0	I: 50000 1
12,2110	C: 24124 0	C: 24124 0	I: 51525 1	C: 62074 0	I: 50025 0	C: 00001 0	C: 24124 0	I: 77765 0
12,2120	C: 02074 0	C: 16074 0	I: 77650 1	C: 24112 0	I: 71201 1	C: 00001 0	C: 02133 1	C: 00025 0
12,2130	I: 53165 0	C: 02074 0	C: 24302 0	I: 51440 0	C: 24302 0	I: 51025 1	C: 00013 0	C: 24302 0
12,2140	I: 51145 0	C: 02074 0	C: 24152 1	I: 57545 1	C: 00013 0	C: 14015 0	C: 24007 0	C: 00013 0
12,2150	I: 77650 1	C: 24155 0	I: 77745 1	C: 24007 0	C: 00015 0	I: 57345 1	C: 02074 0	C: 11030 1
12,2160	I: 77646 0	C: 16177 1	C: 01553 0	I: 77621 1	C: 00025 0	C: 02643 1	I: 63545 0	C: 00025 0
12,2170	I: 41501 0	C: 00047 1	I: 53605 1	C: 00011 1	C: 21572 0	C: 34031 1	C: 24421 0	I: 44200 0
12,2200	C: 24311 1	C: 02074 0	C: 02645 1	I: 44246 1	C: 02177 1	I: 71244 0	C: 24333 1	C: 00037 0
12,2210	I: 60225 1	C: 01551 1	C: 00047 1	I: 60325 0	C: 02643 1	C: 00050 1	I: 41260 0	C: 00047 1
12,2220	C: 02645 1	I: 56257 1	C: 21202 1	I: 41542 1	I: 71244 0	C: 24246 1	C: 00025 0	C: 00013 0
12,2230	I: 45221 1	C: 00015 0	I: 51000 0	C: 24240 1	C: 24240 1	I: 52145 0	C: 00001 0	C: 24260 0
12,2240	I: 45345 1	C: 00015 0	C: 00025 0	I: 52075 1	C: 11033 1	C: 24260 0	I: 77745 1	C: 00025 0
12,2250	C: 00015 0	I: 45221 1	C: 00013 0	I: 50000 1	C: 24274 0	C: 24274 0	I: 77745 1	C: 00001 0
12,2260	C: 02643 1	I: 43254 0	C: 24333 1	C: 00025 0	C: 14025 0	C: 00037 0	C: 01551 1	I: 46034 1
12,2270	C: 24644 1	C: 24333 1	I: 77650 1	C: 24166 0	I: 45345 1	C: 00013 0	C: 00025 0	I: 52075 1
12,2300	C: 11033 1	C: 24260 0	I: 70545 1	C: 00013 0	I: 77765 0	C: 02074 0	C: 00025 0	I: 77650 1
12,2310	C: 24140 1	I: 51145 1	C: 00025 0	C: 24330 1	C: 00013 0	I: 70545 1	C: 02643 1	C: 02643 1
12,2320	I: 44254 1	C: 02112 1	C: 00025 0	C: 14025 0	C: 01551 1	C: 00037 0	I: 77650 1	C: 24267 1
12,2330	C: 00015 0	I: 77650 1	C: 24315 0	I: 44545 0	C: 00041 1	I: 74225 1	C: 00035 1	C: 02647 0
12,2340	I: 65372 1	C: 00025 0	I: 60316 0	C: 00047 1	I: 57275 0	C: 00023 0	C: 00025 0	I: 53605 1
12,2350	C: 00033 1	C: 21572 1	I: 77621 1	C: 00037 0	I: 74352 0	C: 01511 0	I: 53372 1	I: 77712 0
12,2360	C: 01535 0	I: 60246 1	C: 00050 1	C: 14043 0	C: 00031 0	I: 45275 0	C: 00033 1	C: 11015 0
12,2370	I: 76405 1	C: 00021 1	I: 53605 1	C: 00025 0	C: 56601 0	I: 74271 0	C: 00043 0	C: 02647 0

OCTAL LISTING FOR PARAGRAPH # 071, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

12,2400	I: 66372 1	C: 09035 1	I: 56257 1	C: 56602 0	C: 00043 0	I: 74221 0	C: 11031 0	C: 01511 0
12,2410	I: 42455 0	I: 77826 0	C: 62234 0	C: 00037 0	C: 15551 1	C: 00025 0	C: 01552 0	I: 77650 1
12,2420	C: 02112 1	I: 77776 1	C: 07225 0	C: 00010 0	C: 02525 1	C: 12526 0	C: 67356 0	C: 75666 0
12,2430	C: 15001 1	C: 23771 1	C: 64342 0	C: 43674 0	C: 06563 1	C: 04645 1	C: 75173 0	C: 52672 0
12,2440	C: 00656 1	C: 14331 0	C: 77633 1	C: 40512 0	C: 00023 0	C: 11210 1	C: 77774 0	C: 67506 0
12,2450	C: 06042 1	C: 14023 1	C: 00031 0	I: 77776 1	C: 07225 0	C: 00010 0	C: 01000 0	C: 00060 1
12,2460	C: 72525 0	C: 52516 0	C: 13301 1	C: 15337 1	C: 62776 0	C: 54723 1	C: 11176 1	C: 13267 0
12,2470	C: 73410 0	C: 51674 0	C: 01446 0	C: 23641 1	C: 77451 1	C: 65233 0	C: 00055 1	C: 37266 1
12,2500	C: 77767 1	C: 52336 0	C: 06042 1	I: 53605 1	C: 00001 0	C: 21574 1	C: 00035 1	I: 72405 0
12,2510	C: 00043 0	I: 65234 1	C: 21634 0	I: 53605 1	C: 00033 1	C: 21574 1	I: 72405 0	C: 00045 0
12,2520	I: 65234 1	C: 21634 0	C: 00141 1	I: 76261 0	C: 20607 1	I: 41301 0	C: 00047 1	C: 00025 0
12,2530	I: 76257 0	C: 20576 1	I: 57232 0	C: 00023 0	C: 00027 0	I: 77616 0	I: 71214 0	C: 00614 1
12,2540	C: 24606 1	C: 00037 0	I: 60225 1	C: 02762 0	C: 00047 1	I: 60325 0	C: 00015 0	C: 00050 1
12,2550	I: 41250 0	C: 00047 1	C: 02762 1	I: 56257 1	C: 21202 1	I: 43142 1	C: 04351 1	C: 24562 0
12,2560	I: 75246 0	C: 02761 1	I: 51006 0	C: 24620 0	I: 43145 0	C: 02766 1	C: 04311 0	C: 24571 1
12,2570	C: 00017 1	I: 45221 1	C: 00011 1	I: 51000 0	C: 24600 1	C: 24600 1	I: 77650 1	C: 24632 0
12,2600	I: 45345 1	C: 00011 1	C: 02766 1	I: 52005 0	C: 11023 1	C: 24634 0	I: 41345 0	C: 00011 1
12,2610	C: 00051 0	I: 41325 0	C: 00017 1	C: 00051 0	I: 77625 0	I: 52165 1	C: 02760 1	C: 24562 0
12,2620	I: 43145 0	C: 02766 1	C: 04311 0	C: 24625 0	C: 00011 1	I: 45221 1	C: 00017 1	I: 50000 1
12,2630	C: 24636 1	C: 24636 1	I: 77745 1	C: 00001 0	C: 00015 0	I: 77616 0	I: 45345 1	C: 00017 1
12,2640	C: 02766 1	I: 52005 0	C: 11023 1	C: 24634 0	C: 44753 0	C: 50120 1	C: 60026 0	C: 50120 1
12,2650	C: 54026 1	C: 54154 0	C: 06064 0	I: 44545 0	C: 00041 1	I: 74225 1	C: 00035 1	C: 02722 1
12,2660	I: 65372 1	C: 00025 0	I: 60316 0	C: 00047 1	I: 57275 0	C: 00023 0	C: 00025 0	I: 53605 1
12,2670	C: 00033 1	C: 21572 1	I: 77621 1	C: 00037 0	I: 74352 0	C: 02744 1	I: 53372 1	I: 41512 1
12,2700	I: 77646 0	I: 77701 1	C: 00047 1	C: 16720 0	C: 00021 0	I: 45205 1	C: 00033 1	C: 11015 0
12,2710	I: 76405 1	C: 00021 1	I: 53605 1	C: 00025 0	C: 21176 1	I: 74271 0	C: 02720 0	C: 02722 1
12,2720	I: 65372 1	C: 00035 1	I: 56257 1	C: 21175 1	C: 02720 0	I: 77621 1	C: 11031 0	I: 53361 0
12,2730	C: 02744 1	I: 43412 1	I: 40220 0	C: 02710 0	C: 00001 0	I: 77600 1	C: 24727 1	I: 63375 0
12,2740	C: 02655 0	C: 02744 1	I: 77624 1	C: 11046 0	I: 45000 0	C: 24764 1	C: 24767 1	I: 43145 0
12,2750	C: 00031 0	C: 04311 1	C: 25752 0	I: 45014 0	C: 04273 0	C: 24421 0	I: 45014 0	C: 03706 0
12,2760	C: 02710 0	C: 24653 1	I: 77650 1	C: 02710 0	I: 77614 1	C: 04033 0	C: 25752 0	I: 66374 1
12,2770	C: 00003 1	C: 00052 0	C: 00001 0	I: 77614 1	C: 04276 0	I: 65366 1	C: 02732 0	I: 44342 1

OCTAL LISTING FOR PARAGRAPH # 072, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" ENCLOSES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

12,3000	C: 11021 1	I: 54325 1	C: 12730 1	C: 21607 0	I: 77671 1	I: 77600 1	C: 25122 1	I: 41225 1
12,3010	C: 02766 1	I: 40132 0	C: 25122 1	I: 63406 0	I: 65351 0	C: 03155 0	C: 02742 1	I: 76202 0
12,3020	I: 75440 0	C: 25205 1	I: 42306 0	I: 61000 0	C: 25120 0	C: 25013 1	I: 40065 0	C: 11015 0
12,3030	C: 25205 1	I: 41440 1	C: 25205 1	I: 77716 1	I: 41301 0	C: 00047 1	C: 02742 1	I: 77457 1
12,3040	C: 21567 0	C: 07225 0	C: 00005 1	C: 20000 0	C: 00000 1	C: 72525 0	C: 52471 1	C: 03146 1
12,3050	C: 15013 0	C: 75556 0	C: 45210 0	C: 01615 1	C: 13552 0	C: 76371 0	C: 63777 0	C: 01232 0
12,3060	C: 27367 0	C: 60042 1	I: 76405 1	I: 43006 0	C: 04316 1	C: 25172 1	I: 60316 0	C: 00047 1
12,3070	I: 53605 1	C: 02742 1	C: 21565 1	C: 14031 0	C: 00041 1	I: 75542 0	I: 41306 1	I: 77632 0
12,3100	C: 00025 0	I: 60316 0	C: 00047 1	I: 41325 0	C: 02740 0	C: 00041 1	I: 75452 0	I: 56405 0
12,3110	C: 02766 1	C: 14043 0	C: 02742 1	I: 43021 0	C: 11017 1	C: 04270 0	C: 00045 0	I: 77616 0
12,3120	I: 77774 0	C: 00003 1	I: 51001 1	C: 00001 0	C: 25127 1	I: 77614 1	C: 04076 1	I: 75545 1
12,3130	C: 02740 0	I: 41325 0	C: 02730 1	C: 02766 1	I: 65352 0	C: 02732 0	I: 43202 0	C: 11025 0
12,3140	I: 41225 1	I: 55301 0	C: 00047 1	C: 02730 1	I: 51457 0	C: 21174 0	I: 63406 0	C: 14043 0
12,3150	C: 11023 0	I: 63406 0	I: 65234 1	C: 21634 0	C: 02742 1	I: 40040 1	C: 00043 0	I: 77771 0
12,3160	I: 75440 0	C: 25205 1	I: 77615 0	I: 60304 0	C: 25151 0	C: 00047 1	I: 77665 1	I: 52057 1
12,3170	C: 21172 0	C: 25030 1	I: 50145 1	C: 02742 1	C: 25205 1	I: 60366 1	C: 00047 1	I: 52665 1
12,3200	C: 11037 0	C: 20176 0	I: 41425 1	I: 77650 1	C: 25066 0	I: 40001 1	C: 00001 0	C: 25210 0
12,3210	I: 43414 1	C: 04076 1	I: 40220 0	C: 02710 0	C: 00001 0	I: 77607 1	C: 25217 1	I: 76614 0
12,3220	C: 02674 0	C: 10005 0	C: 14017 1	C: 02671 0	I: 77675 0	C: 11024 1	C: 02764 0	I: 77214 0
12,3230	C: 0474 0	C: 02655 0	I: 45115 0	C: 02663 0	C: 11112 0	C: 16730 1	C: 02720 0	I: 65301 0
12,3240	C: 00047 1	C: 00041 1	I: 56342 1	I: 65257 1	C: 20172 0	I: 77626 0	C: 75745 1	I: 44342 1
12,3250	C: 11021 1	C: 02734 0	I: 53106 0	C: 25472 0	I: 65301 0	C: 00047 1	C: 00001 0	I: 56342 1
12,3260	I: 75457 0	C: 20176 0	I: 54325 1	C: 02730 1	C: 20607 1	I: 43271 1	C: 02734 0	I: 77626 0
12,3270	C: 77760 0	I: 50005 1	C: 25277 1	C: 25302 1	I: 50025 0	C: 11043 0	C: 25302 1	I: 77745 1
12,3300	C: 11043 0	C: 00017 1	I: 77745 1	C: 02732 0	I: 45261 0	C: 20607 1	I: 77626 0	C: 61041 0
12,3310	C: 02673 1	I: 71240 1	C: 25513 1	C: 02736 1	I: 56352 0	C: 02730 1	I: 77600 1	C: 25513 1
12,3320	C: 00011 1	I: 66214 0	C: 00715 1	C: 25477 1	C: 00001 0	C: 00001 0	I: 77745 1	C: 02766 1
12,3330	I: 77605 1	C: 02730 1	I: 45342 0	C: 02736 1	I: 65301 0	C: 00047 1	C: 02734 0	I: 56257 1
12,3340	C: 20176 0	I: 53440 0	C: 25427 1	C: 25427 1	C: 16740 0	C: 02766 1	I: 43316 1	C: 11027 1
12,3350	I: 41301 0	C: 00047 1	C: 02740 0	I: 44257 1	C: 20571 0	C: 11025 1	C: 16742 1	C: 02740 0
12,3360	I: 45500 0	C: 25432 0	C: 24767 1	I: 77745 1	C: 00037 0	C: 16762 0	C: 00031 0	I: 45014 0
12,3370	C: 04310 1	C: 25427 1	C: 24421 0	I: 44200 0	C: 25447 1	C: 02671 0	C: 02760 1	I: 44246 1

OCTAL LISTING FOR PARAGRAPH # 073, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

12,3400	C: 02764 0	I: 47144 1	C: 25516 1	C: 24644 1	I: 43020 0	C: 25460 1	C: 00714 0	C: 25415 0
12,3410	I: 45345 1	C: 00027 0	C: 02762 0	I: 77654 0	C: 25460 1	I: 77624 1	C: 24536 1	I: 53145 1
12,3420	C: 00158 0	C: 25460 1	I: 77615 0	C: 02766 1	C: 02766 1	I: 77650 1	C: 25320 0	I: 51145 0
12,3430	C: 00015 0	C: 25452 0	I: 71201 1	C: 00001 0	C: 02766 1	C: 00011 1	I: 70545 1	C: 00015 0
12,3440	C: 00015 0	I: 44254 1	C: 25460 1	C: 02766 1	C: 02766 1	I: 77650 1	C: 25320 0	I: 77745 1
12,3450	C: 02762 0	C: 00037 0	I: 71201 1	C: 00001 0	C: 02766 1	C: 00017 1	I: 77650 1	C: 25436 1
12,3460	I: 51545 1	C: 02761 1	I: 41325 0	C: 02671 0	C: 11012 1	I: 45215 0	C: 11041 1	I: 43044 0
12,3470	C: 25516 1	C: 02434 0	C: 25516 1	I: 43001 0	C: 00001 0	C: 02434 0	C: 02710 0	I: 71331 0
12,3500	C: 00051 0	C: 10030 0	C: 00011 1	I: 65342 1	C: 00017 1	I: 43342 0	I: 77626 0	C: 75011 0
12,3510	C: 00015 0	I: 77650 1	C: 25330 0	I: 52145 0	C: 11045 0	C: 25320 1	I: 60345 0	C: 00041 0
12,3520	C: 00047 1	I: 70525 1	C: 02740 0	I: 77671 1	I: 75457 0	C: 20175 0	I: 72405 0	C: 00021 1
12,3530	I: 41206 0	C: 02766 1	I: 74261 1	C: 20206 1	C: 02722 1	I: 77725 1	I: 76561 1	C: 02674 0
12,3540	I: 53235 0	C: 02722 1	I: 77772 0	C: 02744 1	I: 53125 0	C: 02702 0	C: 25551 1	I: 77650 1
12,3550	C: 02710 0	I: 45145 0	C: 02720 0	C: 24701 1	C: 02702 1	I: 77650 1	C: 02710 0	I: 40220 0
12,3560	C: 02710 0	C: 00001 0	I: 77600 1	C: 25564 1	I: 62375 0	C: 02655 0	C: 02744 1	I: 77624 1
12,3570	C: 11046 0	I: 71200 0	C: 24764 1	C: 11025 0	I: 41225 1	C: 02742 1	C: 02740 0	I: 41266 1
12,3600	C: 02766 1	I: 74212 0	C: 02712 1	I: 45325 1	C: 11017 1	C: 02742 1	I: 52361 1	C: 02722 1
12,3610	I: 52512 1	I: 77610 1	C: 25670 1	I: 60325 0	C: 02756 1	C: 00047 1	I: 41325 0	C: 00041 1
12,3620	C: 02740 0	I: 56257 1	C: 20201 0	I: 56225 1	C: 11023 0	C: 00045 0	C: 00031 0	I: 63400 0
12,3630	C: 25674 0	I: 50021 1	C: 11021 1	C: 25674 0	I: 75366 0	C: 02755 1	I: 77614 1	C: 04272 1
12,3640	I: 76561 1	C: 02674 0	I: 63235 0	C: 00001 0	I: 53361 0	C: 00031 0	I: 41572 1	I: 56241 0
12,3650	C: 02722 1	C: 25765 1	I: 40142 1	C: 25654 1	C: 26732 0	C: 02722 1	I: 76435 1	I: 72441 0
12,3660	C: 02674 0	C: 16730 1	C: 02740 0	I: 77624 1	C: 24767 1	I: 77614 1	C: 02634 1	C: 24747 0
12,3670	I: 43001 1	C: 00001 0	C: 02434 0	C: 25752 0	I: 75345 1	C: 24005 1	C: 00031 0	I: 14031 0
12,3700	C: 24007 0	I: 77614 1	C: 04032 1	C: 25640 1	I: 40220 0	C: 02710 0	C: 00001 0	I: 77600 1
12,3710	C: 25711 1	I: 63275 0	C: 02655 0	C: 02744 1	I: 77624 1	C: 11046 0	I: 77660 1	C: 25720 0
12,3720	I: 42405 0	C: 02742 1	I: 75421 1	C: 11017 1	C: 02752 0	I: 65215 1	C: 11013 0	C: 00041 1
12,3730	I: 72405 0	C: 02740 0	I: 77671 1	I: 60325 0	C: 02742 1	C: 00047 1	I: 53725 1	C: 00041 1
12,3740	C: 20174 1	I: 45271 1	I: 50000 1	C: 25747 1	C: 25747 1	I: 77650 1	C: 02710 0	I: 52145 0
12,3750	C: 24020 0	C: 02710 0	I: 77776 1	C: 05642 1	C: 20697 1	C: 04631 1	C: 23146 0	C: 14000 1
12,3760	C: 00000 1	C: 02314 0	C: 31463 1	C: 01400 1	C: 00000 1	C: 10000 0	C: 00000 1	C: 03000 1
12,3770	C: 00000 1	C: 36000 1	C: 00000 1	C: 03773 1	C: 03774 0	CKSM 51153 1	a	a

OCTAL LISTING FOR PARAGRAPH # 074, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNLSFD FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

13,2000	C: 07112 1	C: 06620 1	C: 27446 1	C: 14620 0	C: 16471 1	C: 61352 1	C: 22437 1	C: 16067 1
13,2010	C: 00000 1	C: 00000 1	C: 02392 1	C: 24736 0	C: 77651 0	C: 76237 0	C: 77776 1	C: 53032 0
13,2020	C: 10407 0	C: 05344 1	C: 13710 0	C: 25320 0	C: 12160 0	C: 12124 0	I: 43014 0	C: 01474 1
13,2030	C: 04347 0	C: 26036 0	I: 43014 0	C: 02756 1	C: 26036 0	C: 01476 0	I: 45014 0	C: 01667 1
13,2040	C: 27135 0	I: 71214 0	C: 04307 1	C: 26063 0	C: 01571 0	C: 34041 0	C: 27412 0	I: 45014 0
13,2050	C: 01674 0	C: 26645 1	I: 77614 1	C: 02756 1	C: 26060 0	I: 43014 0	C: 01476 0	C: 01475 0
13,2060	I: 45014 0	C: 01467 0	C: 27135 0	I: 77614 1	C: 01236 1	C: 26633 0	I: 43414 1	C: 01674 0
13,2070	I: 43414 1	C: 04756 1	C: 26073 1	I: 53775 1	C: 01521 0	C: 57605 0	I: 53655 1	C: 01535 0
13,2100	C: 57576 1	C: 25220 0	C: 01527 0	I: 53257 1	C: 57602 1	C: 01543 1	I: 77657 0	C: 57576 1
13,2110	C: 15226 0	C: 01517 0	C: 01234 0	I: 77616 0	I: 53775 1	C: 01521 0	C: 57605 0	I: 53655 1
13,2120	C: 01535 0	C: 57576 1	C: 25723 0	C: 01527 0	I: 53257 1	C: 57602 1	C: 01543 1	I: 77657 0
13,2130	C: 57576 1	C: 01726 0	I: 77616 0	C: 00041 1	I: 57545 1	C: 00043 0	I: 67401 0	C: 00001 0
13,2140	I: 44276 0	C: 24005 1	C: 14005 1	C: 24007 0	C: 24043 0	C: 00041 1	I: 41056 1	C: 52422 0
13,2150	C: 14041 1	C: 00041 1	I: 44142 0	C: 00051 0	C: 14023 0	C: 00045 0	I: 77742 0	C: 34021 0
13,2160	C: 47222 1	I: 43206 1	C: 24005 1	C: 24007 0	C: 00005 1	I: 77634 0	C: 21636 1	C: 25111 1
13,2170	C: 00001 0	I: 77634 0	C: 21636 1	C: 01107 0	I: 77776 1	40110 0	74740 1	10000 0
13,2200	12204 1	53107 1	53111 0	53107 1	06042 1	I: 77650 1	C: 00051 0	05504 0
13,2210	C: 00031 0	06142 1	I: 77775 1	C: 03434 1	C: 02223 0	I: 77776 1	32337 1	04616 1
13,2220	C: 20477 1	12333 1	02224 1	02216 0	32336 0	04616 1	C: 20477 1	12333 1
13,2230	02232 0	02224 1	06042 1	I: 77745 1	C: 03442 0	C: 34041 0	C: 27044 1	I: 53575 0
13,2240	C: 00001 0	I: 77676 0	C: 00031 0	I: 53435 0	C: 00007 0	C: 00023 0	I: 53435 0	C: 00031 0
13,2250	C: 24015 0	C: 02223 0	I: 75505 0	C: 00015 0	I: 77655 1	C: 00007 0	C: 00007 0	I: 77624 1
13,2260	C: 27412 0	I: 77624 1	C: 26340 1	I: 53775 1	C: 00007 0	C: 57176 0	C: 25543 1	C: 00001 0
13,2270	I: 77657 0	C: 57176 0	C: 15535 0	C: 03442 0	C: 01517 0	I: 71214 0	C: 01673 1	C: 01643 1
13,2300	C: 34041 0	C: 27110 1	I: 77624 1	C: 27412 0	I: 77775 1	C: 00017 1	C: 01503 0	C: 15535 0
13,2310	C: 00015 0	C: 25517 0	C: 00025 0	I: 77624 1	C: 27707 1	I: 77776 1	05353 1	C: 04024 0
13,2320	05504 0	C: 00236 0	06142 1	I: 77624 1	C: 26662 1	I: 77531 0	C: 00053 1	C: 26232 1
13,2330	04616 1	C: 27443 1	I: 77776 1	34755 1	55462 1	16001 1	C: 01524 0	C: 01441 1
13,2340	I: 43174 1	C: 00012 1	C: 00063 1	I: 77014 1	C: 04303 0	C: 00052 0	C: 00000 1	I: 43414 1
13,2350	C: 00263 0	I: 40220 0	C: 03674 1	C: 00001 0	C: 24007 0	C: 02032 1	I: 51406 1	C: 16070 1
13,2360	C: 24007 0	I: 71414 0	C: 01743 0	C: 26364 1	I: 77624 1	C: 51677 0	I: 77656 1	C: 36032 0
13,2370	C: 26550 0	I: 77624 1	C: 26560 0	I: 63545 0	C: 02032 1	I: 63525 0	C: 02034 1	I: 75415 0

OCTAL LISTING FOR PARAGRAPH # 175, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

13,2400	I: 76405 1	C: 07011 1	C: 14021 1	C: 02036 0	C: 34023 1	C: 26510 1	C: 15120 0	C: 02032 1
13,2410	C: 14021 1	C: 02034 1	C: 34023 1	C: 26510 1	C: 15122 1	C: 02070 1	I: 77625 0	C: 03673 0
13,2420	C: 35124 0	C: 03674 1	I: 40220 0	C: 03674 1	C: 04001 0	C: 34007 1	C: 26550 0	I: 72545 1
13,2430	C: 01120 0	I: 65275 1	C: 00011 1	C: 01120 0	I: 65346 0	C: 01122 1	I: 57356 0	I: 71525 0
13,2440	C: 01120 0	I: 71525 0	C: 01122 1	I: 55475 1	I: 41456 0	C: 36032 0	C: 26560 0	I: 43145 0
13,2450	C: 24007 0	C: 01743 0	C: 26454 0	I: 77746 1	I: 77624 1	C: 55716 1	C: 16032 1	C: 03673 0
13,2460	I: 74215 1	C: 01124 1	C: 02032 1	I: 77772 0	C: 36032 0	C: 03674 1	I: 63545 0	C: 02036 0
13,2470	I: 44352 0	C: 24005 1	I: 44275 1	C: 26507 1	C: 24005 1	I: 75465 1	C: 26503 0	I: 77622 1
13,2500	C: 03673 0	I: 77616 0	C: 00446 1	C: 00305 1	C: 17711 0	C: 05254 1	C: 00055 0	C: 25250 1
13,2510	I: 77600 1	C: 26512 0	I: 63545 0	C: 00023 0	I: 63525 0	C: 00021 1	I: 77615 0	I: 75454 0
13,2520	C: 26536 0	I: 47065 0	C: 00023 0	C: 26543 1	I: 67542 0	C: 00025 0	I: 50125 1	C: 00021 1
13,2530	C: 26532 1	I: 43545 1	I: 57545 1	I: 43244 1	C: 26540 1	C: 24005 1	C: 00025 0	I: 77616 0
13,2540	I: 52025 1	C: 24005 1	C: 26536 0	I: 75345 1	C: 11021 1	C: 00023 0	C: 00025 0	I: 77616 0
13,2550	I: 43145 0	C: 26505 1	C: 01743 0	C: 26556 0	I: 77725 0	C: 24005 1	C: 00011 1	I: 77616 0
13,2560	I: 71220 1	C: 00451 1	C: 10003 0	I: 71214 0	C: 01703 1	C: 26575 1	C: 10001 1	I: 45014 0
13,2570	C: 00742 0	C: 26573 1	C: 26466 1	C: 37673 1	C: 00051 0	I: 77214 0	C: 00702 1	C: 26573 1
13,2600	C: 02023 1	I: 64445 0	I: 77650 1	C: 26573 1	05353 1	C: 00052 0	35017 1	05105 0
13,2610	C: 02612 1	C: 26063 0	05261 1	06042 1	I: 47014 1	C: 04712 1	C: 26654 1	C: 21574 1
13,2620	C: 00041 1	I: 77624 1	C: 27412 0	I: 45014 0	C: 01076 1	C: 26645 1	I: 52014 0	C: 01460 1
13,2630	C: 26026 1	C: 00003 1	C: 25140 0	I: 77414 0	C: 01672 0	05253 1	C: 20032 1	00006 1
13,2640	32032 1	05277 0	C: 02604 1	C: 26063 0	05155 0	I: 43014 0	C: 01472 1	C: 01673 1
13,2650	I: 43014 0	C: 01674 1	C: 01675 1	I: 77616 0	I: 77776 1	05353 1	C: 00002 0	05516 0
13,2660	C: 00221 0	05155 0	I: 47020 0	C: 00051 0	C: 26675 1	I: 45014 0	C: 04063 0	C: 26114 1
13,2670	I: 43014 0	C: 00303 1	C: 00051 0	C: 04223 0	C: 00051 0	00303 0	55500 1	51500 0
13,2700	31502 1	51500 0	55554 0	11500 1	12676 0	06064 0	I: 43034 1	C: 26724 1
13,2710	C: 04303 0	C: 26717 1	I: 66214 0	C: 00263 0	C: 02031 1	C: 00001 1	I: 77616 0	I: 66214 0
13,2720	C: 00063 1	C: 02031 1	C: 00002 0	I: 77616 0	03037 0	55500 1	51500 0	31554 1
13,2730	51500 0	55502 0	11500 1	12725 1	06064 0	I: 47020 0	C: 00051 0	C: 26750 1
13,2740	I: 45014 0	C: 04064 1	C: 26070 1	I: 43014 0	C: 00303 1	C: 00051 0	C: 04224 1	C: 00051 0
13,2750	03037 0	55500 1	51500 0	31502 1	51500 0	55626 0	11500 1	12751 1
13,2760	06064 0	I: 47014 1	C: 04307 1	C: 27002 0	C: 26771 1	I: 52014 0	C: 04304 1	C: 26717 1
13,2770	C: 26712 1	03037 0	55500 1	51500 0	31626 1	51500 0	55502 0	11500 1

OCTAL LISTING FOR PARAGRAPH # 076, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

13,3000	12772 0	36864 0	I: 77201 1	C: 00001 0	C: 02022 1	I: 41525 0	C: 00041 1	C: 15517 0
13,3010	C: 27735 0	I: 77624 1	C: 55716 1	C: 25535 0	C: 24001 0	C: 14001 0	C: 01517 0	C: 14007 0
13,3020	C: 27735 0	I: 45014 1	C: 00063 1	C: 55716 1	I: 74235 0	C: 01535 1	C: 26001 1	C: 25543 1
13,3030	C: 24007 1	C: 01521 0	I: 67174 1	C: 00002 0	C: 02030 0	C: 35527 1	C: 27160 0	33043 0
13,3040	54006 0	33450 0	0.002 0	C: 26063 0	I: 45020 1	C: 00046 0	C: 27412 0	I: 42130 1
13,3050	C: 02102 0	C: 71474 1	I: 42014 0	C: 01467 0	C: 01676 1	I: 77614 1	C: 01633 0	C: 27137 1
13,3060	I: 45020 1	C: 00046 0	C: 27412 0	I: 43130 1	C: 02102 0	C: 01634 1	C: 27052 0	I: 45020 1
13,3070	C: 00046 0	C: 27412 0	I: 43130 1	C: 02102 0	C: 01474 1	I: 43014 0	C: 01676 1	C: 01433 1
13,3100	C: 27137 1	I: 45020 1	C: 00046 0	C: 27412 0	I: 43130 1	C: 02102 0	C: 01634 1	C: 27075 0
13,3110	I: 66214 0	C: 01467 0	C: 02031 1	C: 00000 1	I: 66214 0	C: 00343 0	C: 27121 0	C: 02031 1
13,3120	C: 00002 0	I: 77220 1	C: 02102 0	C: 24007 0	C: 01521 0	C: 35527 1	C: 27673 0	I: 43014 0
13,3130	C: 01676 1	C: 04062 1	I: 77614 1	C: 04020 1	C: 27151 1	I: 77620 0	C: 02102 0	I: 43014 0
13,3140	C: 04062 0	C: 04062 1	I: 77731 1	C: 00053 1	C: 27151 1	I: 52014 0	C: 01714 1	C: 26706 1
13,3150	C: 26761 0	I: 77745 1	C: 00041 1	C: 01115 0	I: 52014 0	C: 01753 1	C: 27260 0	C: 27244 0
13,3160	I: 77414 0	C: 01752 0	C: 27201 1	05352 1	C: 04022 0	05504 0	C: 00236 0	06042 1
13,3170	I: 77731 1	C: 00053 1	C: 27177 0	I: 52014 0	C: 01714 1	C: 26662 1	C: 26735 1	I: 77624 1
13,3200	C: 11226 1	I: 45001 1	C: 00001 0	C: 27672 0	I: 52775 1	C: 01503 0	C: 57576 1	I: 53715 1
13,3210	C: 01511 0	C: 57576 1	I: 62325 0	C: 01517 0	C: 01503 0	I: 64715 0	C: 01511 0	C: 51770 0
13,3220	I: 76016 0	C: 77765 0	I: 76014 0	C: 00302 1	C: 27226 1	C: 77775 1	I: 40001 1	C: 00001 0
13,3230	C: 27231 1	I: 43014 0	C: 04676 1	C: 01667 1	I: 77614 1	C: 01672 0	I: 77535 1	C: 02103 1
13,3240	30154 1	50120 1	54052 1	03423 1	I: 45345 1	C: 01115 0	C: 01517 0	C: 36074 1
13,3250	C: 27673 0	I: 77624 1	C: 22404 1	I: 43345 1	C: 01551 1	C: 01517 0	C: 35517 1	C: 27201 1
13,3260	I: 43014 0	C: 04752 0	C: 27265 0	C: 01632 1	C: 27226 1	I: 72001 1	C: 00013 0	C: 02030 0
13,3270	I: 51575 1	C: 01535 0	I: 43006 0	C: 00262 1	I: 50023 0	C: 53755 1	C: 27301 0	I: 77614 1
13,3300	C: 00062 0	I: 41345 0	C: 00013 0	C: 00043 0	I: 55762 1	C: 51770 0	I: 41266 1	C: 25762 0
13,3310	I: 40442 1	I: 54345 1	C: 01155 0	C: 20220 0	I: 40006 0	C: 27342 1	I: 50021 1	C: 27411 0
13,3320	C: 27342 1	I: 45345 1	C: 01115 0	C: 01517 0	I: 54234 0	C: 21613 0	C: 20211 1	C: 02076 1
13,3330	I: 51400 1	C: 27346 0	I: 50025 0	C: 01015 0	C: 27352 0	I: 75345 1	C: 00015 0	C: 02076 1
13,3340	C: 36076 0	C: 27352 0	I: 65345 0	C: 27411 0	I: 77650 1	C: 27321 1	I: 77634 0	C: 21713 1
13,3350	C: 36076 0	C: 27335 1	I: 51545 1	C: 02076 1	I: 50025 0	C: 27407 1	C: 27160 0	I: 43014 0
13,3360	C: 01746 0	C: 23311 0	C: 01707 0	C: 23311 0	I: 45345 1	C: 02076 1	C: 00015 0	I: 42040 1
13,3370	C: 27160 0	C: 04242 1	C: 23311 0	I: 45345 1	C: 01115 0	C: 01517 0	I: 77640 0	C: 27226 1

OCTAL LISTING FCP PARAGRAPH # 100, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

14,2000	C: 26723 0	C: 00450 0	C: 00065 1	C: 01265 1	C: 00302 0	C: 24533 1	C: 00052 0	C: 04047 0
14,2010	C: 15262 0	C: 21773 1	C: 74130 0	C: 42420 1	C: 70032 0	C: 41533 1	C: 15014 0	C: 04650 0
14,2020	C: 67067 1	C: 61150 0	C: 02551 1	C: 15723 0	C: 07210 0	C: 01664 1	C: 67276 0	C: 62232 0
14,2030	C: 13262 0	C: 00563 1	C: 05076 0	C: 35561 0	C: 70716 0	C: 40260 1	C: 62466 1	C: 64656 0
14,2040	C: 10652 1	C: 04246 0	C: 63235 0	C: 44200 0	C: 73710 0	C: 66230 0	C: 07204 0	C: 33712 0
14,2050	C: 61747 1	C: 72343 0	C: 02342 0	C: 21362 0	C: 03237 1	C: 13301 1	C: 62030 0	C: 65332 0
14,2060	C: 70715 0	C: 71267 1	C: 01745 0	C: 06477 0	C: 63531 0	C: 75365 0	C: 12010 0	C: 03005 1
14,2070	C: 76146 1	C: 77014 1	C: 60371 1	C: 75073 1	C: 03370 0	C: 12003 1	C: 76125 0	C: 40037 1
14,2100	C: 72436 0	C: 77052 0	C: 61041 0	C: 54164 0	C: 72277 0	C: 51044 0	C: 62641 0	C: 45471 1
14,2110	C: 70711 1	C: 70546 1	C: 67364 0	C: 47073 0	C: 64425 0	C: 77777 0	C: 07157 0	C: 16322 0
14,2120	C: 63327 1	C: 64446 0	C: 67515 1	C: 55266 0	C: 05230 0	C: 25476 0	C: 64754 0	C: 12604 0
14,2130	C: 71235 0	C: 72553 1	C: 66427 0	C: 42171 0	C: 66546 0	C: 70765 1	C: 73260 1	C: 71643 0
14,2140	C: 14121 0	C: 30153 0	C: 61247 1	C: 73310 1	C: 72312 0	C: 41247 0	C: 74744 0	C: 44566 1
14,2150	C: 70616 0	C: 54564 1	C: 77153 1	C: 61536 0	C: 61601 1	C: 47046 0	C: 60604 0	C: 76224 1
14,2160	C: 77031 0	C: 73354 1	C: 73161 0	C: 63065 1	C: 60431 1	C: 51702 0	C: 06656 1	C: 33013 0
14,2170	C: 04044 0	C: 10627 0	C: 62164 0	C: 45040 1	C: 07325 1	C: 37443 0	C: 03267 1	C: 06626 0
14,2200	C: 63471 0	C: 50471 0	C: 11660 1	C: 04151 0	C: 75501 1	C: 46664 1	C: 70430 1	C: 46540 1
14,2210	C: 07507 1	C: 20100 1	C: 13727 1	C: 05455 0	C: 72160 0	C: 64202 0	C: 11144 0	C: 05203 0
14,2220	C: 64200 1	C: 65331 0	C: 71322 1	C: 41512 1	C: 16402 0	C: 16205 1	C: 01365 0	C: 04034 1
14,2230	C: 75054 1	C: 56052 0	C: 17030 1	C: 17635 1	C: 73321 0	C: 57603 0	C: 77010 0	C: 47623 0
14,2240	C: 11515 0	C: 01640 1	C: 63215 1	C: 52176 0	C: 02143 0	C: 26755 1	C: 12715 1	C: 31470 0
14,2250	C: 13401 0	C: 31222 1	C: 03157 1	C: 27504 0	C: 17402 1	C: 12312 1	C: 75552 1	C: 63657 0
14,2260	C: 05471 0	C: 06122 0	C: 16220 0	C: 16362 1	C: 04417 1	C: 32762 0	C: 06443 1	C: 12622 1
14,2270	C: 07766 1	C: 10237 0	C: 14154 1	C: 26154 1	C: 13200 1	C: 31653 0	C: 13244 1	C: 21036 1
14,2300	C: 01067 1	C: 23106 1	C: 10560 0	C: 27227 0	C: 10402 0	C: 00275 1	C: 65477 0	C: 77044 1
14,2310	C: 20153 0	C: 11212 0	C: 00077 1	C: 36275 1	C: 17777 0	C: 01417 1	C: 07674 0	C: 21771 0
14,2320	C: 03416 1	C: 07626 1	C: 62413 0	C: 57536 0	C: 07510 1	C: 06414 0	C: 10673 1	C: 06065 1
14,2330	C: 15735 1	C: 31531 1	C: 16745 0	C: 17555 1	C: 02615 1	C: 13716 0	C: 73010 1	C: 40311 0
14,2340	C: 15776 0	C: 34660 0	C: 00325 0	C: 26625 1	C: 07572 0	C: 05105 0	C: 15472 1	I: 77634 0
14,2350	C: 21574 1	I: 43225 0	C: 01234 0	C: 03454 1	I: 77476 1	C: 07262 0	35016 0	54003 0
14,2360	C: 00004 0	10155 1	12365 1	12365 1	34755 1	64753 1	55644 1	C5173 1
14,2370	C: 02402 0	05353 1	C: 47014 1	C: 76133 1	C: 02402 0	C: 30067 0	06742 1	I: 52014 0

OCTAL LISTING FOR PARAGRAPH # 101, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

14,2400	C: 03470 1	C: 60452 1	04674 0	C: 75555 0	35027 1	05105 0	C: 02416 0	C: 30067 0
14,2410	05353 1	C: 07024 0	C: 17009 1	C: 02416 0	C: 30067 0	15261 0	05504 0	C: 00214 0
14,2420	32437 0	04616 1	C: 20477 1	12426 1	12430 0	12420 1	04635 0	C: 71464 1
14,2430	00004 0	04674 0	C: 40154 0	04674 0	C: 40141 1	04635 0	C: 71454 1	C: 04077 0
14,2440	I: 77620 0	C: 02746 0	C: 35242 0	C: 26351 1	I: 70545 1	C: 01122 1	C: 16711 1	C: 01124 1
14,2450	C: 16713 0	C: 01120 0	C: 02707 0	I: 77776 1	32477 1	04616 1	C: 20477 1	16001 1
14,2460	12462 1	12454 1	06042 1	I: 72545 0	C: 02711 1	C: 15122 1	C: 02713 0	C: 15124 1
14,2470	C: 02707 0	C: 15120 0	C: 01242 1	I: 77624 1	C: 26422 1	I: 77650 1	C: 02746 0	C: 01531 1
14,2500	I: 77620 0	C: 02745 0	C: 37562 1	C: 33647 1	I: 77745 1	C: 03562 0	C: 34041 0	C: 27060 1
14,2510	I: 61131 0	C: 00052 0	C: 00000 1	C: 30535 1	I: 74375 0	C: 02723 0	C: 30001 0	I: 52372 0
14,2520	C: 00011 0	I: 77656 1	C: 26723 0	C: 00001 0	I: 57456 1	C: 16707 0	C: 30005 1	I: 77624 1
14,2530	C: 30567 0	C: 14017 1	C: 30576 0	C: 34023 1	C: 30562 0	I: 74375 0	C: 02723 0	C: 30007 0
14,2540	I: 53445 1	C: 02715 0	C: 26715 0	C: 02723 0	I: 53361 0	C: 30001 0	C: 00001 0	I: 57456 1
14,2550	C: 26707 0	C: 00001 0	I: 57456 1	C: 16723 0	C: 30003 1	I: 77624 1	C: 30567 0	C: 14023 0
14,2560	C: 30576 0	C: 00017 1	I: 77745 1	C: 30600 1	C: 00021 1	I: 77650 1	C: 02745 0	I: 70471 1
14,2570	C: 00045 0	I: 43336 0	C: 30602 0	I: 70546 1	I: 77616 0	C: 07760 1	C: 14473 1	C: 04000 0
14,2600	C: 00000 1	C: 00343 0	C: 21616 0	04645 1	55745 1	06042 1	I: 77624 1	C: 47541 1
14,2610	I: 77624 1	C: 24030 0	I: 77601 0	C: 00001 0	I: 71214 0	C: 01465 1	C: 24007 0	C: 26756 1
14,2620	C: 02665 0	I: 63361 0	C: 24005 1	C: 02701 0	I: 74370 0	C: 00344 1	C: 24005 1	I: 77655 1
14,2630	I: 53505 1	C: 01734 0	C: 02731 0	I: 66331 0	C: 00051 0	C: 00006 1	C: 00052 0	C: 00006 1
14,2640	I: 52100 1	C: 30643 0	C: 30760 0	I: 50373 0	C: 30347 1	C: 02731 0	I: 50025 0	C: 30757 1
14,2650	C: 30640 0	I: 77754 1	C: 00046 0	I: 52104 0	C: 30656 1	C: 30640 0	I: 50373 0	C: 47430 0
14,2660	C: 02731 0	I: 50025 0	C: 30757 1	C: 30653 1	I: 47772 1	C: 30347 1	C: 47430 0	I: 51025 1
14,2670	C: 30755 0	C: 30653 1	I: 45173 0	C: 30347 1	C: 30732 1	I: 77614 1	C: 01710 0	C: 30640 0
14,2700	I: 45173 0	C: 47430 0	C: 30732 1	I: 77614 1	C: 01710 0	C: 30653 1	I: 77614 1	C: 01605 0
14,2710	C: 30725 1	I: 65120 1	C: 02755 1	C: 02756 1	I: 47773 1	C: 30347 1	C: 47430 0	I: 43006 0
14,2720	C: 01545 1	C: 30711 0	I: 45345 1	I: 77644 1	C: 30653 1	I: 67130 1	C: 02755 1	C: 02756 1
14,2730	I: 77650 1	C: 30653 1	I: 51321 0	C: 02707 0	C: 00017 1	I: 77654 0	C: 30751 1	I: 75240 0
14,2740	C: 30751 1	C: 00160 0	I: 75240 0	C: 30751 1	C: 00162 1	I: 43040 1	C: 30751 1	C: 01630 0
14,2750	C: 00052 0	I: 77614 1	C: 01430 1	C: 00052 0	C: 05110 1	C: 35052 0	C: 05110 1	C: 35052 0
14,2760	I: 77414 0	C: 01745 0	C: 30764 1	03005 1	I: 73150 1	C: 02755 1	C: 02755 1	I: 47775 1
14,2770	C: 02731 0	C: 30347 1	I: 47715 1	C: 02731 0	C: 47430 0	I: 77625 0	I: 66044 1	C: 31003 0

CTAL LISTING FOR PARAGRAPH # 102, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

14,3100	C: 02756 1	I: 77734 1	C: 02755 1	I: 77776 1	25745 0	31745 0	04622 0	I: 77620 0
14,3110	C: 02746 0	I: 77776 1	05353 1	C: 04024 0	34761 0	04616 1	C: 20624 0	06001 0
14,3120	03022 1	03045 0	06042 1	I: 43234 0	C: 21574 1	C: 31155 1	I: 77624 1	C: 20500 1
14,3130	I: 77776 1	04616 1	C: 30603 1	02035 1	03045 0	05567 0	C: 00405 0	25006 1
14,3140	04616 1	C: 20477 1	06001 0	03045 0	03014 1	24755 1	55757 1	06042 1
14,3150	I: 77776 1	05353 1	C: 04024 0	06042 1	I: 77624 1	C: 31671 0	I: 77776 1	04616 1
14,3160	C: 16000 0	04616 1	C: 17704 1	05701 1	11757 1	12067 1	03137 1	06042 1
14,3170	I: 77775 1	C: 02715 0	C: 02767 0	I: 77776 1	05353 1	C: 04024 0	06042 1	I: 45145 0
14,3180	C: 03562 0	C: 32472 1	I: 53521 1	C: 01734 0	C: 26715 0	C: 03554 0	I: 53521 1	C: 01734 0
14,3190	C: 26707 0	C: 02761 0	C: 24007 0	C: 02767 0	C: 34015 1	C: 31250 1	I: 45014 0	C: 00254 0
14,3120	C: 31126 0	C: 47443 1	I: 77624 1	C: 31216 0	I: 77614 1	C: 01273 0	I: 77776 1	25741 0
14,3130	04616 1	C: 20624 0	06001 0	03014 1	06042 1	I: 77650 1	C: 02746 0	06042 1
14,3140	I: 77775 1	C: 02715 0	C: 02761 0	I: 45145 0	C: 03562 0	C: 32472 1	C: 03554 0	I: 77731 1
14,3150	C: 02761 1	C: 00000 0	I: 77650 1	C: 31050 0	C: 00002 0	C: 06240 1	I: 45020 1	C: 02746 0
14,3160	C: 47251 1	I: 43014 0	C: 01260 1	C: 01662 1	I: 77776 1	33215 1	04616 1	C: 20452 0
14,3170	33247 0	04616 1	C: 017315 0	04616 1	C: 17710 1	05701 1	05353 1	C: 04024 0
14,3200	06042 1	I: 75160 1	C: 03606 1	C: 01733 1	I: 77624 1	C: 31371 0	I: 43014 0	C: 01273 0
14,3210	C: 01462 0	I: 77624 1	C: 31603 0	I: 77650 1	C: 31126 0	C: 04024 0	I: 77620 0	C: 02745 0
14,3220	I: 77624 1	C: 47251 1	I: 77776 1	33246 1	04616 1	C: 20477 1	06001 0	03231 1
14,3230	03243 1	05353 1	C: 00214 0	33247 0	04616 1	C: 17315 0	04616 1	C: 17710 1
14,3240	05701 1	05252 1	C: 04024 0	06042 1	I: 77650 1	C: 02745 0	C: 01525 0	C: 02737 0
14,3250	I: 43021 1	C: 02745 0	C: 00074 1	I: 77760 0	C: 02706 1	I: 47773 1	C: 00001 0	C: 00007 0
14,3260	I: 65552 0	C: 00025 0	I: 43014 0	C: 00354 0	C: 31274 1	C: 00174 0	I: 71360 1	C: 00006 1
14,3270	C: 00025 0	C: 00023 0	I: 77650 1	C: 31255 1	I: 45345 1	C: 00025 0	C: 00023 0	I: 47046 0
14,3300	C: 21613 0	C: 01045 1	I: 77414 0	C: 00074 1	33320 0	04616 1	C: 20477 1	16001 1
14,3310	03315 0	06042 1	I: 52014 0	C: 00274 0	C: 02745 0	06042 1	I: 77650 1	C: 02745 0
14,3320	C: 01405 1	I: 77624 1	C: 31620 1	I: 66234 1	C: 31405 1	C: 00051 0	C: 00001 0	I: 40370 1
14,3330	C: 00003 1	C: 00005 1	I: 70543 1	C: 00325 0	I: 70522 1	C: 00005 1	I: 51425 0	I: 45206 1
14,3340	C: 31404 0	I: 71240 1	C: 31260 0	I: 51025 1	C: 31405 1	C: 31360 0	I: 77776 1	05353 1
14,3350	C: 04024 0	06042 1	I: 77624 1	C: 31557 1	I: 77624 1	C: 31603 0	I: 77650 1	C: 31262 1
14,3360	I: 77700 0	C: 31332 1	I: 75160 1	C: 02642 0	C: 01733 1	I: 77624 1	C: 31371 0	I: 77650 1
14,3370	C: 32161 0	I: 77773 1	C: 00001 0	C: 10001 1	I: 77773 1	C: 00007 0	C: 10007 1	I: 77772 1

OCTAL LISTING FOR PARACRAFT # 102, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

14,3400	C: 00015 0	C: 10015 1	I: 77616 0	C: 00056 1	C: 37722 1	00004 0	30032 0	50120 1
14,3410	54001 1	30033 1	50120 1	54002 1	30034 0	50120 1	54003 0	00003 1
14,3420	06064 0	04616 1	C: 33635 1	34761 0	04616 1	C: 20624 0	06001 0	12452 1
14,3430	05353 1	C: 04024 0	34755 1	54321 0	54322 0	54323 1	35010 0	04616 1
14,3440	C: 20447 1	33556 1	04616 1	C: 20447 1	06042 1	I: 77624 1	C: 21557 1	I: 77776 1
14,3450	05353 1	C: 04024 0	12423 0	05353 1	C: 00014 1	06042 1	I: 77624 1	C: 31602 0
14,3460	I: 40331 1	C: 02760 1	C: 70000 1	C: 00001 0	I: 77776 1	05353 1	C: 04024 0	04616 1
14,3470	C: 16000 0	04616 1	C: 17704 1	05701 1	11757 1	12503 0	06042 1	I: 77775 1
14,3500	C: 02715 0	C: 02761 0	I: 77776 1	05353 1	C: 04024 0	11757 1	13522 0	05252 1
14,3510	C: 04024 0	06042 1	I: 45145 0	C: 03562 0	C: 32472 1	C: 02554 0	I: 77776 1	34753 1
14,3520	55757 1	13465 1	05353 1	C: 04024 0	06042 1	I: 45145 0	C: 03562 0	C: 32472 1
14,3530	C: 24015 0	C: 03554 0	C: 24007 0	C: 02761 0	C: 26767 0	C: 02767 0	C: 36715 1	C: 21250 1
14,3540	I: 77414 0	C: 00314 1	C: 31544 0	03422 1	I: 77624 1	C: 47443 1	I: 75160 1	C: 02664 1
14,3550	C: 01733 1	I: 77624 1	C: 31371 0	I: 77414 0	C: 01462 0	06001 0	C: 12200 0	I: 77776 1
14,3560	31301 1	00006 1	13567 1	34777 1	04616 1	C: 01736 1	13560 0	04616 1
14,3570	C: 16772 1	04616 1	C: 17710 1	05701 1	04616 1	C: 17202 1	04616 1	C: 17710 1
14,3600	05701 1	06042 1	I: 77616 0	I: 77776 1	30025 0	55074 1	44755 0	54037 1
14,3610	54040 1	54041 0	06042 1	I: 77775 1	C: 24007 0	C: 01472 1	I: 43414 1	C: 01060 0
14,3620	I: 45020 1	C: 02746 0	C: 47541 1	I: 77624 1	C: 20030 0	I: 66370 0	C: 00022 1	C: 00051 0
14,3630	C: 00006 1	I: 61373 1	C: 02707 0	C: 01734 0	I: 77656 1	C: 06707 1	I: 77700 0	C: 31631 1
14,3640	I: 75160 1	C: 03606 1	C: 02642 0	I: 77624 1	C: 31371 0	I: 77624 1	C: 47355 1	I: 77650 1
14,3650	C: 02746 0	I: 77624 0	C: 02746 0	C: 34041 0	C: 27101 1	I: 53575 0	C: 00001 0	C: 27607 0
14,3660	C: 00007 0	I: 53435 0	C: 00001 0	C: 27615 0	C: 03607 0	I: 52435 0	C: 03615 0	C: 37623 1
14,3670	C: 02746 0	I: 77420 1	C: 03665 1	51757 0	31755 1	00006 1	73772 1	64744 1
14,3700	54734 0	33773 1	04616 1	C: 20477 1	06001 0	13707 0	13701 0	05516 0
14,3710	C: 00124 0	31734 1	77747 1	00006 1	74743 1	54001 1	00006 1	63735 0
14,3720	65650 1	00006 1	13735 1	25016 0	54003 0	50001 0	31403 1	54001 1
14,3730	35014 1	54003 0	34737 0	56001 0	13745 0	22774 0	04616 1	C: 20477 1
14,3740	06001 0	13742 0	13735 1	00006 1	31345 1	50120 1	52011 0	06042 1
14,3750	I: 77624 1	C: 10520 1	I: 45034 1	C: 21574 1	C: 32472 1	I: 52521 1	C: 01734 0	C: 03773 1
14,3760	I: 77776 1	04616 1	C: 54123 0	37747 1	70724 0	00006 1	13701 0	06042 1
14,3770	I: 77650 1	C: 03665 1	C: 05253 0	C: 00306 1	C: 01527 0	C: 03775 1	C: 03776 1	CKSM 54437 0

OCTAL LISTING FOR PARAGRAPH # 1.4, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

15,2000	I: 77773 1	C: 00001 0	C: 00766 0	I: 47133 0	C: 00002 0	C: 21577 1	C: 00031 0	I: 77654 0
15,2010	C: 16171 1	I: 71406 0	I: 73525 1	I: 65361 0	C: 00023 0	I: 52361 1	C: 00015 0	I: 47256 0
15,2020	C: 02765 0	I: 41456 0	I: 47133 0	C: 00004 0	C: 21577 1	C: 00033 1	I: 43225 0	C: 00031 0
15,2030	C: 32047 0	I: 77605 1	C: 32466 1	C: 00033 1	I: 74356 1	I: 65372 1	C: 00033 1	I: 74346 0
15,2040	C: 03765 0	I: 53372 1	I: 45056 0	C: 47666 1	C: 34031 1	C: 16276 0	C: 37777 1	C: 37775 0
15,2050	04616 1	C: 11236 0	34750 1	70076 1	10000 0	02060 0	36250 0	02061 1
15,2060	34753 1	55144 1	34753 1	04616 1	C: 20714 1	06001 0	12073 0	02062 1
15,2070	05353 1	C: 00014 1	05155 0	31144 1	76250 1	50000 1	02077 0	12105 0
15,2100	12153 0	12110 1	06042 1	I: 77650 1	C: 32164 0	00006 1	31401 0	12112 0
15,2110	00006 1	34755 1	53045 0	32170 0	04616 1	C: 20477 1	06001 0	02121 1
15,2120	02113 0	53045 0	00006 1	62125 0	12127 0	00006 1	30025 0	53775 1
15,2130	31144 1	74752 1	10000 0	02127 0	06042 1	I: 77650 1	C: 32220 0	06042 1
15,2140	I: 45145 0	C: 02775 0	C: 31651 1	I: 77624 1	C: 31620 1	I: 77776 1	35010 0	04616 1
15,2150	C: 20477 1	06001 0	12171 0	06042 1	I: 77650 1	C: 32143 0	06042 1	I: 77624 1
15,2160	C: 31321 0	I: 43014 0	C: 01462 0	C: 01273 0	I: 77624 1	C: 31007 1	I: 77776 1	06001 0
15,2170	C: 01442 1	32217 1	04616 1	C: 20624 0	16001 1	12156 0	06042 1	I: 64375 1
15,2200	C: 03607 0	C: 01724 0	I: 77656 1	C: 26665 0	C: 03615 0	I: 53521 1	C: 01734 0	C: 26673 1
15,2210	C: 03623 0	I: 53521 1	C: 01734 0	C: 36701 1	C: 31156 1	I: 77650 1	C: 32166 1	C: 00013 0
15,2220	I: 43014 0	C: 01462 1	C: 00662 0	I: 77201 1	C: 00001 0	C: 02023 1	I: 41525 0	C: 02775 0
15,2230	C: 36401 1	C: 55716 1	I: 77742 0	C: 16032 1	C: 02775 0	I: 77624 1	C: 30440 1	I: 53575 0
15,2240	C: 02032 1	C: 37627 1	C: 10775 0	I: 77650 1	C: 32143 0	40077 0	74737 1	10000 0
15,2250	12455 0	32463 1	04616 1	C: 20477 1	06001 0	12257 1	12245 1	47747 0
15,2260	76734 0	00006 1	76245 0	56001 0	51757 0	55755 0	50120 1	54046 1
15,2270	00006 1	12455 0	40000 0	62557 1	00006 1	62455 1	06042 1	I: 64373 1
15,2300	C: 30347 1	C: 01734 0	I: 45056 0	C: 47650 1	C: 02721 0	I: 77776 1	34753 1	55241 0
15,2310	35016 0	54003 0	51241 1	31403 1	54001 1	35014 1	54003 0	34737 0
15,2320	56001 0	55745 1	50120 1	52001 0	06042 1	I: 77624 1	C: 10520 1	I: 50275 0
15,2330	C: 02731 0	C: 03765 0	I: 65552 0	C: 00021 0	I: 51025 1	C: 32466 1	C: 32420 0	I: 45345 1
15,2340	C: 00031 0	C: 32470 0	I: 71240 1	C: 32413 0	C: 00031 0	I: 42405 0	C: 13762 0	C: 24031 0
15,2350	C: 03765 0	I: 53425 0	C: 24005 1	I: 47206 0	C: 03765 0	I: 77676 0	I: 63256 0	C: 03765 0
15,2360	I: 53435 0	C: 02731 0	I: 50206 0	C: 00001 0	I: 65552 0	C: 24033 1	I: 77641 1	I: 71244 0
15,2370	C: 32375 1	C: 32047 0	I: 77625 0	C: 00033 1	C: 00033 1	I: 70535 0	C: 02746 0	I: 41415 1

OCTAL LISTING FOR PARAGRAPHS # 105, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNLASED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

15,2400	C: 00033 1	I: 77634 0	C: 21615 0	C: 15236 1	C: 00031 0	I: 77615 0	I: 77634 0	C: 21615 0
15,2410	C: 01241 0	I: 77776 1	12437 1	I: 77776 1	34755 1	55235 0	55237 1	12437 1
15,2420	I: 77776 1	25241 1	41241 0	64757 0	00006 1	62427 1	12310 0	05567 0
15,2430	C: 01404 1	35006 1	04616 1	C: 20477 1	16001 1	12455 0	12245 1	32464 0
15,2440	04616 1	C: 20477 1	16001 1	12445 1	12245 1	34757 0	71241 0	00006 1
15,2450	74745 1	47747 0	70734 0	60001 0	54734 0	04616 1	C: 16000 0	04616 1
15,2460	C: 17714 1	05761 1	13037 1	C: 00306 1	C: 01517 0	C: 02525 1	C: 12525 0	C: 00026 0
15,2470	C: 30131 1	C: 12525 0	C: 03562 0	I: 77420 1	C: 02736 1	47747 0	70734 0	00006 1
15,2500	76245 0	56001 0	51757 0	55755 0	10000 0	12521 1	32560 0	04616 1
15,2510	C: 20477 1	02576 0	02514 0	02506 0	06042 1	I: 53575 0	C: 02707 0	I: 77650 1
15,2520	C: 02736 1	40110 0	62557 1	00006 1	62535 0	51757 0	31755 1	50120 0
15,2530	54046 1	06042 1	I: 52173 0	C: 30347 1	C: 02736 1	06042 1	I: 45145 0	C: 03562 0
15,2540	C: 30500 1	I: 77340 0	C: 02757 0	C: 02707 0	C: 24001 0	C: 02715 0	C: 26707 0	C: 00001 0
15,2550	C: 02715 0	I: 70143 0	C: 02756 1	C: 00154 1	I: 52173 0	C: 02343 1	C: 02736 1	C: 00243 0
15,2560	C: 01530 0	32762 0	54321 0	40000 0	54322 0	32763 1	54323 1	06042 1
15,2570	I: 45014 0	C: 01662 1	C: 32666 0	I: 66370 0	C: 00022 1	C: 00051 0	C: 00066 1	I: 77744 0
15,2600	C: 00050 1	I: 45173 0	C: 54000 0	C: 47675 0	C: 06707 1	I: 77775 1	C: 02731 0	I: 73744 1
15,2610	C: 00047 1	C: 75041 1	I: 71152 1	C: 00047 1	I: 63047 1	C: 54000 0	C: 00002 0	C: 06665 1
15,2620	I: 45100 1	C: 32661 1	C: 47355 1	I: 74575 0	C: 02715 0	C: 36723 1	C: 32666 0	I: 74575 0
15,2630	C: 02715 0	I: 53655 0	C: 02723 0	C: 02761 0	I: 77641 1	C: 02231 0	I: 65552 0	C: 01045 1
15,2640	I: 77776 1	05516 0	C: 00014 1	32761 0	04616 1	C: 20477 1	06001 0	12652 0
15,2650	05514 0	C: 00014 1	05353 1	C: 04024 0	06042 1	I: 77775 1	C: 02761 0	C: 02231 0
15,2660	I: 77776 1	34751 0	70074 0	10000 0	12561 0	13536 0	I: 77220 1	C: 02745 0
15,2670	C: 24007 0	C: 02717 0	I: 77776 1	05353 1	C: 04024 0	06042 1	I: 77624 1	C: 31557 1
15,2700	I: 77776 1	32760 1	55736 0	37721 1	55074 1	04616 1	C: 15707 0	05353 1
15,2710	C: 04024 0	04616 1	C: 77541 1	06042 1	I: 77776 1	35000 1	05173 1	C: 02721 1
15,2720	05155 0	04674 0	C: 77541 1	35023 0	05145 0	C: 02731 1	C: 32065 0	05261 1
15,2730	04616 1	C: 15271 1	25736 1	06042 1	I: 53375 0	C: 00325 0	C: 02707 0	C: 02707 0
15,2740	I: 50135 0	C: 02737 0	C: 32714 1	I: 53575 0	C: 02707 0	C: 36731 1	C: 47541 1	I: 77624 1
15,2750	C: 47673 0	C: 02715 0	I: 77776 1	05353 1	C: 04024 0	06042 1	I: 77650 1	C: 02745 0
15,2760	C: 77753 0	C: 01404 0	C: 07357 1	C: 06211 0	I: 71220 1	C: 02745 0	C: 00322 1	I: 65325 0
15,2770	C: 00324 1	C: 00323 0	I: 77666 1	C: 24766 0	C: 24005 1	I: 77624 1	C: 47666 1	C: 26707 0

OCTAL LISTING FOR PARAGRAPH # 1 1 6, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

15,3000	C: 24003 1	I: 77624 1	C: 47675 0	C: 36715 1	C: 47541 1	I: 77624 1	C: 20030 0	I: 77775 1
15,3010	C: 02665 0	C: 24007 1	C: 02673 1	C: 34015 1	C: 47443 1	I: 77624 1	C: 47251 1	I: 77776 1
15,3020	33027 1	04616 1	C: 17315 0	04616 1	C: 17710 1	05701 1	12755 0	C: 02737 0
15,3030	34755 1	13023 0	34753 1	55757 1	05353 1	C: 04024 0	12245 1	31757 0
15,3040	00006 1	13052 1	05353 1	C: 04024 0	06042 1	I: 45145 0	C: 03562 0	C: 32472 1
15,3050	C: 37255 1	C: 33064 0	06042 1	I: 77775 1	C: 02715 0	C: 02761 0	I: 45145 0	C: 03562 0
15,3060	C: 32472 1	C: 03247 0	I: 77776 1	13022 1	I: 77131 1	C: 00052 0	C: 00006 1	C: 00014 1
15,3070	I: 64373 1	C: 74514 1	C: 03607 0	I: 77656 1	C: 12723 1	I: 77773 1	C: 75002 1	C: 10023 1
15,3100	I: 43104 0	C: 33070 0	C: 04315 1	C: 33111 1	I: 77624 1	C: 31251 1	I: 77614 1	C: 00254 0
15,3110	C: 33171 0	I: 77624 1	C: 47443 1	I: 77624 1	C: 47251 1	I: 77776 1	34752 0	70104 0
15,3120	10000 0	13130 1	C: 33276 1	04616 1	C: 20477 1	06001 0	13130 1	13172 1
15,3130	06042 1	I: 40175 0	C: 02740 0	C: 33134 1	C: 02750 1	I: 40141 1	C: 30602 0	C: 33237 1
15,3140	I: 52131 0	C: 02746 0	C: 33144 0	C: 33017 1	I: 77776 1	05353 1	C: 04024 0	06042 1
15,3150	I: 75160 1	C: 03606 1	C: 01733 1	I: 45014 0	C: 01462 0	C: 31371 0	I: 77776 1	11144 0
15,3160	13162 0	13172 1	34752 0	70104 0	10000 0	13544 0	06042 1	I: 77624 1
15,3170	C: 33471 0	I: 77776 1	35741 0	04616 1	C: 20624 0	16001 1	13544 0	44752 1
15,3200	61144 1	00006 1	13204 0	16001 1	05353 1	C: 04024 0	06042 1	I: 45175 0
15,3210	C: 02231 0	C: 47663 1	I: 43105 1	C: 01734 0	C: 01463 1	I: 51515 1	C: 02023 1	I: 45561 1
15,3220	C: 75145 0	I: 47014 1	C: 00662 0	C: 21574 1	I: 77624 1	C: 30440 1	C: 01220 0	I: 65252 0
15,3230	C: 01242 1	I: 77606 1	C: 35234 1	C: 51677 0	C: 02023 1	I: 77776 1	16001 1	I: 75160 1
15,3240	C: 02664 1	C: 02642 0	I: 77624 1	C: 31371 0	I: 77624 1	C: 47541 1	I: 77624 1	C: 20030 0
15,3250	I: 77624 1	C: 47255 1	I: 77414 0	C: 04355 0	C: 33266 0	35010 0	04616 1	C: 20477 1
15,3260	06001 0	13263 1	13255 1	05353 1	C: 04024 0	06042 1	I: 77624 1	C: 31557 1
15,3270	I: 77624 1	C: 31603 0	I: 77624 1	C: 32764 0	I: 77650 1	C: 33144 0	C: 01535 0	04616 1
15,3300	C: 33635 1	36251 0	55144 0	34753 1	04616 1	C: 20714 1	06001 0	13214 0
15,3310	13303 0	05353 1	C: 00014 1	05155 0	31144 1	76250 1	50000 1	13220 1
15,3320	13333 0	13274 0	13303 0	06042 1	I: 75160 1	C: 01733 1	C: 03606 1	I: 77624 1
15,3330	C: 31371 0	I: 77650 1	C: 33373 0	06042 1	I: 77745 1	C: 03442 0	C: 01045 1	I: 77776 1
15,3340	32170 0	04616 1	C: 20477 1	16001 1	13346 1	13340 1	06042 1	I: 65234 1
15,3350	C: 21574 1	C: 01045 1	I: 65254 1	C: 33363 1	I: 51025 1	C: 01045 1	C: 33363 1	I: 45545 1
15,3360	C: 74335 1	C: 36775 1	C: 33365 1	I: 45545 1	C: 75002 1	C: 34041 0	C: 27060 1	I: 53575 0
15,3370	C: 00001 0	C: 37607 1	C: 10775 0	I: 77776 1	34755 1	55144 0	55145 1	34737 0

OCTAL LISTING FOR PARAGRAPH # 111, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

16,2000	00006 1	00001 0	40000 0	74355 1	00006 1	12157 1	41300 1	74746 1
16,2010	10001 0	12266 1	41262 1	74751 1	27262 1	12163 0	34742 1	00006 1
16,2020	02030 0	10000 0	12157 1	00002 0	22016 0	00006 1	22012 1	31262 0
16,2030	74737 1	10000 0	12041 1	34737 0	27262 1	37720 0	05072 1	C: 03637 0
16,2040	C: 42106 0	02000 0	30111 0	74751 1	00006 1	12157 1	04674 0	C: 40154 0
16,2050	34755 1	55524 1	55525 0	55526 0	55421 0	55422 0	55423 1	55430 0
16,2060	55431 1	55432 1	55537 0	55540 0	55541 1	55542 1	55424 0	55425 1
16,2070	55501 0	55513 1	55545 0	55546 0	55510 0	55512 1	55502 0	55631 0
16,2100	55633 1	55672 0	55634 0	55460 0	55461 1	55767 1	55770 1	55771 0
16,2110	42212 1	71262 1	55262 1	00006 1	30023 1	53441 0	30034 0	55442 0
16,2120	41262 1	74743 1	27262 1	34751 0	55535 1	55536 1	34733 1	54031 1
16,2130	55466 0	55470 1	34755 1	55467 1	55471 0	55465 0	55472 0	55473 1
16,2140	55474 0	44363 1	55757 1	34752 0	55433 0	55434 1	55435 0	00006 1
16,2150	32205 1	53264 1	37732 0	54300 0	15270 0	C: 02024 0	C: 34106 1	04674 0
16,2160	C: 36655 1	14674 0	C: 35452 1	00006 1	32156 1	53264 1	34755 1	55472 0
16,2170	55473 1	55474 0	00006 1	01005 0	00006 1	01006 0	42203 0	00006 1
16,2200	03112 1	12152 1	C: 03021 1	C: 07400 1	C: 02213 0	C: 34106 1	00006 1	32212 1
16,2210	52006 0	C: 02227 1	C: 40106 1	37732 0	26030 0	22016 0	00006 1	22012 1
16,2220	11757 1	05624 1	C: 32000 0	02000 0	30032 0	55750 0	30023 1	55751 1
16,2230	30034 0	55752 1	31635 0	00006 1	21640 0	02256 1	55635 1	31636 0
16,2240	00006 1	21641 1	02256 1	55636 1	31637 1	00006 1	21642 1	02256 1
16,2250	55637 0	00006 1	27445 1	00006 1	27457 1	12647 1	10000 0	64753 1
16,2260	00002 0	40000 0	00002 0	00006 1	71741 0	21427 0	00006 1	31427 1
16,2270	53744 0	11426 1	12274 0	12304 0	62315 1	00006 1	62304 1	11426 1
16,2300	34733 1	00002 0	44723 0	00002 0	53427 0	00006 1	11750 0	00002 0
16,2310	54007 1	00002 0	50000 1	44734 1	00002 0	C: 77147 0	31737 0	00006 1
16,2320	71530 1	55755 1	31750 1	54001 1	00006 1	21440 1	23440 0	55737 1
16,2330	33624 1	55755 0	41745 1	00006 1	74736 0	27430 0	31746 0	61545 1
16,2340	00006 1	77741 0	27431 1	31747 1	61546 1	00006 1	77741 0	27432 1
16,2350	31751 0	54001 1	00006 1	21441 0	23441 1	55740 1	00006 1	71414 0
16,2360	61737 0	53427 0	02266 1	00006 1	61421 1	27430 0	02310 1	55430 0
16,2370	00006 1	31744 1	21447 0	41454 1	00006 1	73624 0	21447 0	31752 0

OCTAL LISTING FOR PARAGRAPH # 111, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

16,2400	54071 1	00006 1	21442 0	55741 0	23442 1	31415 0	00006 1	71740 1
16,2410	53427 0	31417 1	02263 1	00006 1	61422 1	27431 1	02310 1	55431 1
16,2420	00006 1	31744 1	21451 1	41455 0	00006 1	72624 0	21451 1	31416 0
16,2430	00006 1	31740 1	53427 0	31420 0	02263 1	00006 1	61422 0	27432 1
16,2440	02310 1	55432 1	00006 1	31744 1	21453 0	41456 0	00006 1	73624 0
16,2450	21453 0	30111 0	74737 1	00006 1	12462 1	00006 1	31405 1	53751 1
16,2460	31403 1	12466 0	00006 1	31410 0	53751 1	31406 1	55752 1	11430 0
16,2470	12472 0	12507 0	61752 0	00006 1	62507 1	22007 0	23420 1	34755 1
16,2500	00006 1	11433 0	27421 0	02310 1	55421 0	31750 1	55423 0	25423 1
16,2510	31745 0	27421 0	02310 1	55421 0	11431 1	12517 1	12544 1	61752 0
16,2520	00006 1	62544 0	22007 0	23431 0	34755 1	00006 1	11434 1	55727 1
16,2530	27422 0	02310 1	55422 0	31750 1	57434 0	61751 0	57727 0	00006 1
16,2540	74756 0	00006 1	11737 1	27537 0	25434 0	31746 0	61545 1	27422 0
16,2550	02310 1	55422 0	11432 1	12555 1	12602 0	61752 0	00006 1	62602 1
16,2560	22007 0	23432 0	34755 1	00006 1	11435 0	55740 1	27423 1	02210 1
16,2570	55423 1	31750 1	57435 1	61751 0	57740 0	00006 1	74756 0	00006 1
16,2600	11740 1	27541 1	25435 1	31747 1	61546 1	27423 1	02310 1	55423 1
16,2610	40111 1	74744 1	10000 0	12624 1	55424 0	55425 1	55545 0	55546 0
16,2620	55527 0	55541 1	12667 0	C: 00074 1	31510 1	00006 1	74766 0	21540 0
16,2630	31537 1	55424 0	00006 1	72622 0	55545 0	31512 0	00006 1	74766 0
16,2640	21542 1	31541 0	55425 1	00006 1	73622 0	55546 0	12667 0	34747 1
16,2650	71262 1	03742 0	52011 0	53754 1	32666 0	56017 1	22112 1	22112 1
16,2660	53756 0	32665 0	52016 1	53760 0	15275 0	C: 02667 1	13645 1	11632 0
16,2670	12710 1	12714 0	11634 0	12712 0	12724 0	00006 1	27767 1	00006 1
16,2700	27770 1	00006 1	27771 0	34740 0	71262 1	00006 1	12734 1	02740 0
16,2710	55632 0	12672 1	55634 0	12675 0	55501 0	55510 0	45007 1	00006 1
16,2720	03012 1	34735 1	55632 0	12672 1	55503 1	55512 1	45020 1	00006 1
16,2730	03012 1	34735 1	55634 0	12675 0	41262 1	74740 1	27262 1	13630 0
16,2740	00006 1	00031 0	40000 0	73617 0	00006 1	13014 0	00006 1	74745 1
16,2750	50000 1	23576 0	55744 0	36245 1	03555 1	46245 0	61743 0	00006 1
16,2760	13013 1	44756 0	61744 1	00006 1	63002 0	41743 1	64751 0	00006 1
16,2770	63013 0	05567 0	C: 02001 1	34753 1	23262 0	00006 1	06001 0	55262 1

OCTAL LISTING FOR PARAGRAPH # 112, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

16,3000	34755 1	13014 0	34753 1	23262 0	00006 1	06001 0	55262 1	74752 0
16,3010	64751 0	27744 0	12753 0	31741 1	55472 0	34737 0	00006 1	02031 1
16,3020	00006 1	13027 0	30111 0	74743 1	10000 0	12467 0	13071 0	34735 1
16,3030	70111 1	00006 1	13071 0	34755 1	55464 1	30022 0	55635 1	11460 0
16,3040	13054 1	34751 0	00006 1	02031 1	00006 1	13064 1	34750 1	00006 1
16,3050	02031 1	00006 1	13062 1	13446 0	00006 1	00031 0	40000 0	75741 1
16,3060	55460 0	13446 0	44363 1	13065 0	34363 0	55524 1	34753 1	55460 0
16,3070	13354 1	00006 1	00021 0	55443 1	74735 0	00006 1	13226 0	34740 0
16,3100	70111 1	00006 1	13467 0	34743 0	71262 1	00006 1	13120 0	34737 0
16,3110	00006 1	12021 1	00006 1	13223 0	45114 0	71262 1	55262 1	13223 0
16,3120	31262 0	74742 0	00006 1	13125 0	13223 0	13262 0	74741 0	00006 1
16,3130	13134 0	13223 0	C: 74777 0	C: 00056 1	44740 1	00004 0	70111 1	54111 1
16,3140	34737 0	00006 1	02031 1	00006 1	13150 1	30032 0	55635 1	03152 1
16,3150	04674 0	C: 40154 0	00003 1	13467 0	55464 1	34740 0	26111 1	34755 1
16,3160	55446 1	55447 0	55450 0	55451 1	55452 1	55453 0	55454 1	55455 0
16,3170	55456 0	54042 0	54044 0	33132 1	71262 1	55262 1	41262 1	74743 1
16,3200	27262 1	03204 1	00003 1	13446 0	22044 1	30042 1	53463 0	34755 1
16,3210	54043 1	54042 1	54044 0	00004 0	00006 1	23265 1	06022 1	33623 0
16,3220	00006 1	05013 0	01265 1	34755 1	54043 1	13232 0	34740 0	70111 1
16,3230	00006 1	13154 0	30032 0	55635 1	14043 1	13240 0	13240 0	13240 0
16,3240	60000 1	60001 1	63133 0	00006 1	70043 1	30001 0	00006 1	71444 0
16,3250	57454 0	43000 1	61454 0	55737 0	03204 1	00003 1	41454 1	61421 1
16,3260	55427 0	11737 1	13265 1	13273 0	13265 1	61476 0	00006 1	63273 1
16,3270	34771 1	55445 1	03304 0	31262 0	74742 0	00006 1	13300 0	03304 0
16,3300	31446 0	55752 1	55464 1	03473 1	30032 0	55635 1	34755 1	55446 1
16,3310	55447 0	55464 1	11427 0	03316 0	03316 0	03316 0	55737 1	61476 0
16,3320	00006 1	63331 0	31445 0	00006 1	03331 0	41262 1	74742 0	27262 1
16,3330	13334 1	44742 0	71262 1	55262 1	41427 0	00006 1	71551 0	20001 1
16,3340	02310 1	00006 1	77721 0	55524 1	21737 0	61475 0	00006 1	63352 0
16,3350	36245 1	13361 1	31524 0	27524 1	34747 1	70101 0	10000 0	34753 1
16,3360	64751 0	55742 1	34753 1	54001 1	11524 1	13372 0	13446 0	13271 0
16,3370	13446 0	22047 0	64753 1	55737 1	23744 1	03535 1	46245 0	61743 0

OCTAL LISTING FOR PARAGRAPH # 113, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

16,3400	00006 1	13403 1	44752 1	64751 0	55521 1	31741 1	05744 0	41737 1
16,3410	63616 0	00006 1	63630 1	63576 0	00006 1	63422 0	27737 1	51744 1
16,3420	33625 0	55524 1	31737 0	22007 0	00004 0	53471 0	04674 0	C: 37143 0
16,3430	44740 1	71262 1	55262 1	03435 0	13630 0	30101 1	54001 1	34747 1
16,3440	00006 1	06001 0	54101 0	00003 1	00002 0	03435 0	05743 1	34755 1
16,3450	55524 1	13631 0	30033 1	00006 1	21626 1	00006 1	71414 0	57752 0
16,3460	30032 0	00006 1	21635 1	61274 1	27752 1	57464 0	00002 0	03452 1
16,3470	41643 0	61421 1	55427 0	44753 0	55505 1	30111 0	74737 1	00006 1
16,3500	12511 0	00004 0	04674 0	C: 43730 1	31524 0	00006 1	13445 0	00003 1
16,3510	13254 1	34755 1	55500 1	00004 0	04674 0	C: 37304 1	00003 1	41741 0
16,3520	63534 0	00006 1	63254 0	11524 1	13526 1	13446 0	63533 1	00006 1
16,3530	63354 0	36245 1	13361 1	C: 77377 1	C: 75117 1	36245 1	55742 0	51743 0
16,3540	33567 0	51744 1	73560 0	55741 0	71260 0	10000 0	13550 0	00002 0
16,3550	11742 0	13555 0	05567 0	C: 02003 0	13446 0	55743 1	13536 0	12773 1
16,3560	C: 00252 1	C: 00125 1	C: 00140 1	C: 00006 1	C: 00220 1	C: 00011 1	C: 00151 1	C: 00146 1
16,3570	C: 00226 1	C: 00231 1	C: 00151 1	C: 00132 1	C: 00245 1	C: 00377 1	C: 77445 1	C: 00004 0
16,3600	C: 00002 0	C: 07776 0	C: 00005 1	C: 00011 1	C: 00012 1	C: 07776 0	C: 00003 1	C: 00010 0
16,3610	C: 00007 0	C: 07776 0	C: 07776 0	C: 07776 0	C: 07776 0	C: 07776 0	C: 00360 1	C: 07400 1
16,3620	C: 00266 0	C: 74631 0	C: 06315 0	C: 00690 1	C: 07622 0	C: 77751 1	C: 00026 0	C: 02734 0
16,3630	41645 0	61423 0	02310 1	55437 1	41644 1	61422 1	02310 1	55426 0
16,3640	00006 1	33644 1	52056 0	C: 02124 1	C: 36106 0	34752 0	55744 0	60000 1
16,3650	54002 1	51744 1	11524 1	13655 0	12674 0	63735 0	00006 1	63713 1
16,3660	51744 1	11524 1	33735 0	13665 0	43735 1	51744 1	27524 1	51744 1
16,3670	11524 1	43621 0	13674 0	23621 1	00006 1	51744 1	71521 1	30001 0
16,3700	51744 1	55727 1	00006 1	74742 0	00006 1	63736 0	50002 0	27512 0
16,3710	11744 0	13646 1	13722 1	34755 1	51744 1	57524 0	00006 1	74760 0
16,3720	30001 0	13674 0	31740 0	61741 1	00006 1	71522 0	55747 0	41741 0
16,3730	61740 0	00006 1	71521 0	55746 1	12316 0	C: 77537 0	40000 0	24002 0
16,3740	13706 1	C: 07400 1	41501 0	00006 1	71507 0	23510 1	41503 1	00006 1
16,3750	71511 1	23512 0	11501 0	34742 1	13756 1	34743 0	54066 0	11503 1
16,3760	34740 0	13743 1	34741 1	26066 0	43741 1	00006 1	02012 0	60066 1
16,3770	00006 1	01012 0	44747 0	71262 1	55262 1	00002 0	C: 03776 1	CKSM 24431 1

OCTAL LISTING FOR PARAGRAPH # 114, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

17,2000	54032 1	00006 1	00004 0	54001 1	74346 0	40000 0	64746 0	74346 0
17,2010	55270 1	67751 0	00006 1	62001 1	30032 0	00006 1	05013 0	40001 1
17,2020	55267 1	04707 0	55266 0	34750 1	00006 1	02013 1	00006 1	12050 1
17,2030	12031 0	00006 1	00004 0	61267 0	64736 1	64736 1	56001 0	32053 0
17,2040	61270 0	00006 1	60001 0	00006 1	62050 0	62054 1	00006 1	62030 0
17,2050	22002 0	31266 1	52005 0	C: 00440 1	C: 77754 1	10031 1	00002 0	05675 0
17,2060	05675 0	34733 1	22007 0	53471 0	53465 1	23465 1	54031 1	67720 1
17,2070	54000 0	12075 0	34733 1	54031 1	12115 1	00006 1	23265 1	22070 0
17,2100	06022 1	00006 1	23265 1	22070 0	34735 1	00006 1	05013 0	31466 1
17,2110	67730 1	54000 0	12115 1	34733 1	55466 0	50001 0	15743 0	22016 0
17,2120	00006 1	22012 1	02055 0	15270 0	34737 0	00006 1	02031 1	10000 0
17,2130	12135 0	40111 1	74740 1	00006 1	12136 0	02655 0	11631 0	12636 1
17,2140	12623 0	34755 1	55631 0	53437 1	03200 0	53427 0	34745 0	00006 1
17,2150	02031 1	00006 1	12200 1	34744 1	00006 1	02031 1	00006 1	12201 1
17,2160	34746 0	70111 1	10000 0	12200 0	55473 1	55474 0	40111 1	74744 0
17,2170	00006 1	12176 1	30106 0	74737 1	10000 0	34752 0	55500 1	12232 1
17,2200	34753 1	64751 0	55744 0	67750 1	55500 1	30111 0	74741 0	10000 0
17,2210	12352 0	30111 0	74742 0	10000 0	34753 1	64752 0	55743 1	03225 1
17,2220	11741 0	12224 0	05567 0	C: 02002 1	35764 1	71171 0	55473 1	45764 0
17,2230	71741 0	55474 0	34737 0	00006 1	02031 1	10000 0	12710 1	34735 1
17,2240	70111 1	00006 1	12354 0	00004 0	04674 0	C: 40154 0	34755 1	55450 0
17,2250	55452 1	00003 1	00006 1	00031 0	55737 1	11461 1	12300 1	31737 0
17,2260	74753 0	00006 1	12304 0	31737 0	74753 1	00006 1	12310 0	31737 0
17,2270	74747 0	00006 1	12314 1	31737 0	74746 1	00006 1	12316 0	13112 1
17,2300	41737 1	72351 0	55461 1	13112 1	33136 0	55525 0	43136 1	12220 0
17,2310	43136 1	55525 0	33136 1	12320 0	33136 0	12317 1	43136 1	55525 0
17,2320	55526 0	32350 0	55477 0	34753 1	55461 1	55505 1	30111 0	74737 1
17,2330	00006 1	12341 1	51505 0	11525 0	34776 0	12337 0	44776 1	51505 0
17,2340	55525 0	30111 0	74742 0	10000 0	34753 1	64752 0	55743 1	12756 0
17,2350	C: 02325 1	C: 00063 1	34751 0	12216 1	55633 1	44753 0	55631 0	34735 1
17,2360	71443 1	00006 1	12377 1	34740 0	70111 1	00006 1	12710 1	44743 1
17,2370	71262 1	55262 1	12374 1	C: 00056 1	34755 1	55462 1	55463 0	11462 1

OCTAL LISTING FOR PARAGRAPH # 115, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNLASED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

17,2400	12403 0	12403 0	12403 0	60000 1	60000 1	62373 1	00006 1	71462 1
17,2410	30001 0	00006 1	71444 0	57455 1	40000 0	61455 1	55741 0	11463 0
17,2420	12423 1	12423 1	12423 1	60000 1	60000 1	62373 1	00006 1	71463 0
17,2430	30001 0	00006 1	71444 0	57456 1	40000 0	61456 1	55742 0	41455 0
17,2440	61422 1	55436 0	41456 0	61423 0	55437 1	53437 1	03200 0	53427 0
17,2450	11741 0	02454 0	02454 0	02454 0	61476 0	00006 1	62460 1	12476 1
17,2460	11742 0	02464 0	02464 0	02464 0	61476 0	00006 1	62470 0	12476 1
17,2470	31262 0	74741 0	00006 1	12475 1	12500 1	12710 1	34771 1	55457 1
17,2500	00004 0	04674 0	C: 40154 0	00003 1	34755 1	55450 0	55451 1	55452 1
17,2510	55453 0	11426 1	12515 0	12515 0	12515 0	61476 0	00006 1	62532 0
17,2520	11427 0	12524 1	12524 1	12524 1	61476 0	00006 1	62530 0	12544 1
17,2530	34756 1	55427 0	12544 1	11427 0	02537 1	02537 1	62537 1	61476 0
17,2540	00006 1	62553 0	34755 1	55426 1	31457 0	00006 1	62553 0	41262 1
17,2550	74741 0	27262 1	02556 0	44741 0	71262 1	55262 1	62622 0	55477 0
17,2560	34753 1	55505 1	34751 0	55743 1	51505 0	51525 0	12567 0	34751 0
17,2570	51505 0	55525 1	13034 1	51505 0	11426 1	34755 1	12600 1	34753 1
17,2600	51505 0	63755 0	50000 1	41571 1	00006 1	51505 0	71426 1	54002 1
17,2610	20001 1	60002 0	54000 0	12615 0	30002 0	51505 0	55525 1	12756 0
17,2620	34755 1	12615 0	C: 02561 1	34736 1	70111 1	10000 0	12141 0	11502 0
17,2630	12632 0	12141 0	00006 1	00005 1	10000 0	12641 1	00006 1	32654 1
17,2640	52006 0	11623 1	12644 1	12141 0	00004 0	04674 0	C: 43321 0	00003 1
17,2650	34755 1	55633 1	12141 0	C: 03070 0	C: 42106 0	30033 1	00006 1	21636 1
17,2660	55737 1	00006 1	71415 1	55752 1	30034 0	00006 1	21627 0	55740 1
17,2670	00006 1	71417 0	61275 0	61752 0	57450 1	31737 0	00006 1	71416 1
17,2700	55752 1	31740 0	00006 1	71420 1	61276 0	61752 0	57452 0	00002 0
17,2710	31452 0	22000 1	31450 1	03200 0	53752 1	33142 0	55477 0	34753 1
17,2720	55505 1	51505 0	51535 0	12724 0	34751 0	51505 0	55535 1	13034 1
17,2730	51505 0	31751 0	55752 1	51505 0	31426 0	55427 0	30111 0	74737 1
17,2740	10000 0	12744 0	03304 0	12756 0	40111 1	74736 0	10000 0	55621 0
17,2750	00004 0	04674 0	C: 43730 1	00003 1	34751 0	55743 1	30101 1	74737 1
17,2760	00006 1	12772 0	40106 1	74737 1	00006 1	12772 0	30111 0	74744 0
17,2770	00006 1	13112 1	34752 0	54001 1	51505 0	11525 0	13003 0	13026 1

OCTAL LISTING FOR PARAGRAPH # 116, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

17,3000	13092 1	13026 1	22007 0	64753 1	55737 1	31505 0	60001 0	55744 0
17,3010	31737 0	63137 1	70006 1	63037 0	03225 1	51505 0	33134 1	54001 1
17,3020	31741 1	00004 0	50001 0	05744 0	00003 1	13100 1	51505 0	33134 1
17,3030	70004 0	50001 1	05743 1	00003 1	11505 1	01477 1	13270 0	41737 1
17,3040	63136 0	00006 1	63061 0	27737 1	51505 0	11525 0	33136 0	13051 1
17,3050	43136 1	51505 0	55525 0	11500 1	13060 0	00006 1	00004 0	74753 0
17,3060	55743 1	03225 1	51505 0	33134 1	00004 0	55471 0	31741 1	51471 1
17,3070	05744 0	31737 0	55470 1	03143 1	00003 1	34755 1	51505 0	55535 1
17,3100	46250 1	61743 0	00006 1	63106 0	34752 0	13107 0	34753 1	51505 0
17,3110	55522 1	13034 1	34755 1	55525 0	55526 0	34751 0	00004 0	57535 0
17,3120	00006 1	13123 0	05747 0	34751 0	57526 0	00003 1	00006 1	13270 0
17,3130	00004 0	05760 0	00003 1	13270 0	C: 00004 0	C: 00015 0	C: 00026 0	C: 77417 0
17,3140	C: 00600 1	C: 00266 0	C: 02720 0	41470 1	60031 0	00006 1	63163 0	22465 1
17,3150	53467 1	53471 0	54031 1	23465 1	00006 1	23265 1	06022 1	34735 1
17,3160	00006 1	05013 0	01265 1	61466 1	00006 1	63174 0	23467 0	53471 0
17,3170	00006 1	60021 0	53467 1	00002 0	40000 0	64754 0	55470 1	00002 0
17,3200	23740 0	00006 1	71627 1	57740 0	00006 1	71620 1	54001 1	61740 0
17,3210	55737 1	13215 0	50000 1	44734 1	55737 1	41740 1	60001 0	54007 1
17,3220	13223 0	50001 1	44734 1	23737 0	00002 0	51744 1	33257 1	51743 0
17,3230	73263 1	55741 0	71257 1	10000 0	13236 1	00002 0	36250 0	55743 1
17,3240	51744 1	33257 1	51743 0	73263 1	55741 0	71257 1	00006 1	13235 1
17,3250	11743 1	13237 0	51505 0	55525 0	05567 0	C: 02004 1	13026 1	C: 00110 1
17,3260	C: 00022 1	C: 00041 1	C: 00041 1	C: 00125 1	C: 00252 1	C: 00146 1	C: 00231 1	C: 00377 1
17,3270	33272 0	07757 0	C: 03273 1	53754 1	52011 0	53756 0	56017 1	22002 0
17,3300	34735 1	53760 0	52016 1	15272 1	00006 1	23745 0	51505 0	33755 0
17,3310	55746 1	31427 1	00006 1	63320 0	31746 0	55744 0	33757 1	13330 0
17,3320	41752 1	55752 1	41427 0	55427 0	34753 1	27746 1	55744 0	43757 0
17,3330	55740 1	31752 0	00006 1	74747 0	10000 0	13717 1	13340 1	13663 0
17,3340	34737 0	00006 1	70001 1	55752 1	31427 1	00006 1	74750 0	00006 1
17,3350	13352 1	13725 0	23427 1	31427 1	00006 1	70000 0	00006 1	74737 1
17,3360	55737 1	11752 1	13365 0	13365 0	13365 0	63760 0	00006 1	51746 0
17,3370	61601 1	00006 1	63377 1	34752 0	27744 0	34751 0	13402 0	11500 1

OCTAL LISTING FOR PARAGRAPH # 117, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

17,3400	13402 0	13373 1	55743 1	41737 1	00006 1	51744 1	71567 0	51746 C
17,3410	61671 1	01036 1	61752 0	55741 0	00006 1	63575 0	51746 C	21573 1
17,3420	00006 1	71737 1	61752 0	51746 C	61683 0	00006 1	63461 1	51505 C
17,3430	41525 0	00006 1	71740 1	00006 1	63455 0	11555 1	13447 1	41741 0
17,3440	51746 0	61685 0	00006 1	63455 0	03561 0	21741 1	13615 1	51746 C
17,3450	41671 0	61037 1	61741 1	00006 1	63457 1	34755 1	13521 0	03561 C
17,3460	13602 1	54741 1	11741 1	13467 0	55675 0	44752 1	27744 C	30001 C
17,3470	00006 1	51744 1	71576 C	20001 1	20001 1	53750 0	51744 1	31570 1
17,3500	00006 1	71427 1	55742 C	00006 1	73767 C	61747 1	67751 C	00006 1
17,3510	63536 1	31742 1	00006 1	73770 0	61747 1	63761 1	00006 1	63546 C
17,3520	34741 1	00006 1	71740 1	51505 C	55525 0	00006 1	51505 0	71547 1
17,3530	30001 0	00006 1	63535 1	34751 0	55742 1	01745 C	43766 1	61742 1
17,3540	53750 0	00006 1	11747 C	00006 1	74736 0	13656 C	00006 1	33172 C
17,3550	21750 0	31742 1	63762 1	53750 C	00006 1	11747 C	00006 1	74736 C
17,3560	13521 0	41740 1	55740 1	21427 1	00006 1	51744 1	71567 C	55742 C
17,3570	63773 1	00006 1	63574 1	13520 1	00002 0	03561 0	31741 1	61555 C
17,3600	00006 1	63615 0	41556 1	61742 1	00006 1	63610 0	31742 1	13521 C
17,3610	11427 0	34748 C	13521 C	05675 0	13521 0	00006 1	51746 C	61605 C
17,3620	00006 1	51744 1	71575 C	20001 1	20001 1	53750 0	31742 1	63773 1
17,3630	00006 1	71000 0	00006 1	61747 1	00006 1	63520 0	31747 1	67751 0
17,3640	00006 1	63651 0	33763 C	53750 C	00006 1	11747 0	61742 1	63764 1
17,3650	13521	43765 1	53750 0	00006 1	11747 C	61742 1	63775 1	00006 1
17,3660	63455 C	63774 0	13521 0	43776 C	27427 0	00006 1	63707 1	63745 1
17,3670	31427 1	00006 1	51744 1	71571 1	67744 1	00006 1	63700 0	13520 1
17,3700	00006 1	13520 1	64740 0	20001 1	20001 1	20001 1	13656 C	03747 0
17,3710	11740 1	34753 1	13714 1	37752 0	27744 0	41427 0	13671 0	03745 1
17,3720	33776 1	61427 1	54000 0	13671 C	13520 1	63745 1	51746 0	41601 0
17,3730	61752 0	00006 1	74741 0	57427 1	00006 1	70000 C	00006 1	51746 C
17,3740	71571 1	61427 1	00006 1	63455 C	13520 1	41740 1	55740 1	34751 C
17,3750	55743 1	34735 1	55741 0	00002 C	C: 77757 1	C: 00000 0	C: 00000 0	C: 14400 0
17,3760	C: 75672 1	C: 77750 0	C: 00632 0	C: 01463 1	C: 00232 1	C: 77462 1	C: 77631 0	C: 77145 1
17,3770	C: 75462 0	C: 00007 0	C: 25605 C	C: 76631 1	C: 00122 0	C: 77655 1	C: 04476 0	CKSM 47425 1

OCTAL LISTING FOR PARAGRAPH # 120, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

20,2000	C: 01150 1	C: 01046 1	C: 07361 1	C: 00666 1	32114 1	70111 1	55340 0	40106 1
20,2010	74737 1	10010 0	34736 1	27340 0	31340 1	74355 1	00006 1	12034 0
20,2020	31341 1	72113 1	55340 0	32112 1	04616 1	C: 20353 0	15472 1	12037 0
20,2030	12014 1	36245 1	05464 1	15155 1	34737 0	27340 0	12021 1	00004 0
20,2040	44737 1	70106 1	54001 1	41340 0	74736 0	10000 0	34737 0	60001 0
20,2050	54116 1	41340 0	74355 1	10000 0	44737 1	62114 1	71340 0	54001 1
20,2060	42114 0	70111 1	60001 0	54111 1	74737 1	10000 0	31327 0	61326 1
20,2070	55243 1	20111 0	74741 0	00006 1	12101 1	44735 0	70075 1	54075 1
20,2100	12104 1	40075 1	74735 0	26075 1	30111 0	76250 1	60000 1	55322 1
20,2110	04635 0	C: 02211 1	C: 00256 0	C: 33133 0	C: 12123 1	30111 0	74747 0	00006 1
20,2120	12122 0	12130 0	30111 0	74750 0	00006 1	12141 0	32153 1	12131 1
20,2130	32152 0	55343 1	10006 1	22070 0	37720 0	C: 03644 1	C: 42106 0	
20,2140	00070 0	32151 0	12131 1	00006 1	22070 0	02154 0	32153 1	55342 0
20,2150	12134 1	C: 01155 0	C: 03434 1	C: 00554 0	35015 0	56003 1	54001 1	30032 0
20,2160	55635 1	30033 1	55636 1	30034 0	55637 0	12171 0	35015 0	56003 1
20,2170	54011 1	34755 1	55643 0	55644 1	55645 0	55640 0	55641 1	55642 1
20,2200	55274 0	55275 1	55276 1	22003 1	00002 0	00006 1	22071 1	02166 1
20,2210	22003 1	55537 0	55540 0	55541 1	55542 1	55424 0	55425 1	55545 0
20,2220	55546 0	22003 1	40111 1	74744 0	26111 1	02116 0	00071 1	31262 0
20,2230	54001 1	34750 1	00006 1	06001 0	55262 1	74750 0	10000 0	12336 1
20,2240	40074 0	74735 0	00006 1	12257 1	30074 1	74750 0	10000 0	12266 0
20,2250	41450 0	55762 1	41452 1	55763 0	41464 1	57761 0	12456 0	41422 0
20,2260	55762 1	41423 1	55763 0	41421 0	57761 0	12456 0	00006 1	12061 0
20,2270	30222 1	00006 1	20033 0	55761 1	00006 1	71415 1	57762 0	30222 0
20,2300	00006 1	20034 1	55763 0	00006 1	71417 0	61762 0	02451 0	55762 1
20,2310	31761 0	00006 1	71416 1	57763 1	00006 1	71420 1	61763 1	02451 0
20,2320	55763 0	31761 0	00006 1	71414 0	57761 0	30321 1	00006 1	20032 1
20,2330	61761 0	02451 0	55761 1	00006 1	22061 0	12456 0	31262 0	76245 0
20,2340	00006 1	12376 0	74751 1	00006 1	12367 0	44746 1	00006 1	03012 1
20,2350	44755 0	55761 1	55762 1	55763 0	55764 1	55765 0	55766 0	54050 0
20,2360	54051 1	54052 1	46245 0	71262 1	64752 0	55262 1	12456 0	34746 0
20,2370	00006 1	05012 1	46245 0	71262 1	55262 1	12456 0	34746 0	00006 1

OCTAL LISTING FOR PARAGRAPHS # 121, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

20,2400	02012 0	10000 0	12407 1	41262 1	74751 1	27262 1	12456 0	34752 0
20,2410	54063 0	42450 0	00096 1	50063 1	71761 1	54001 1	10000 0	32446 0
20,2420	12422 0	42446 1	60001 0	54061 1	12430 0	50001 1	32446 0	54001 1
20,2430	50063 1	41764 1	60001 0	50063 1	26050 0	50063 1	23764 0	10063 0
20,2440	12410 1	37743 0	00006 1	05014 1	12456 0	C: 77177 0	C: 37200 1	C: 00000 1
20,2450	C: 03146 1	54007 1	00000 0	50000 1	44734 1	00002 0	00000 1	32462 0
20,2460	50006 0	C: 02016 1	C: 34106 1	35015 0	54003 0	04645 1	54117 1	30111 0
20,2470	74737 1	54157 0	10000 0	41327 1	61243 0	55326 0	00004 0	30106 0
20,2500	74737 1	00006 1	12526 0	44733 0	55475 1	35741 0	54154 0	41326 0
20,2510	61400 1	00016 1	52517 0	41326 0	62001 1	00006 1	62544 0	27326 0
20,2520	22007 0	10117 0	31327 0	61326 1	53244 0	12544 1	44742 0	55475 1
20,2530	36245 1	54154 0	41326 0	62002 1	00006 1	62517 0	41326 0	62003 0
20,2540	61400 1	00006 1	62544 0	12517 1	00003 1	10157 0	13111 1	34752 0
20,2550	54155 1	44752 1	26154 0	31326 1	50154 1	63064 0	54156 1	00006 1
20,2560	50154 1	33046 0	00006 1	10156 1	50154 1	63063 1	50155 0	55530 1
20,2570	10155 1	12550 1	12574 1	12673 0	41532 0	61531 1	00006 1	62623 1
20,2600	00006 1	11521 0	54155 1	62110 1	00006 1	62610 1	43110 0	54155 1
20,2610	30155 0	00016 1	73104 0	63106 0	55630 1	44733 0	60155 0	00006 1
20,2620	71630 1	55627 1	12646 0	00006 1	11532 0	54155 1	40155 1	63110 1
20,2630	00006 1	62634 1	33110 1	54155 1	30155 0	00006 1	73104 0	63107 1
20,2640	55627 1	40155 1	64735 1	00006 1	71627 1	55630 1	41627 1	00006 1
20,2650	71531 0	55632 1	31630 0	00006 1	71522 0	61533 0	00006 1	74736 0
20,2660	55533 1	55534 0	10154 0	34755 1	55502 0	13234 0	44752 1	54154 0
20,2670	44753 0	54155 1	12553 1	31245 0	00006 1	71243 1	03002 0	C: 03105 0
20,2700	00006 1	71527 1	00004 0	54154 0	00006 1	71532 0	03002 0	C: 02000 0
20,2710	55511 1	30154 1	00006 1	71531 0	03002 0	C: 02000 0	55507 0	00006 1
20,2720	73103 1	55534 0	31511 0	00006 1	73103 1	55506 1	00006 1	00012 1
20,2730	54155 1	34752 0	12734 1	34755 1	54154 0	30155 0	50154 1	73077 0
20,2740	00006 1	12755 0	30155 0	50154 1	73106 1	00006 1	12752 1	50154 1
20,2750	41507 0	12756 0	50154 1	31507 1	12756 0	34755 1	50154 1	55510 0
20,2760	10154 0	12733 0	40111 1	74736 0	00006 1	13712 1	41263 0	63772 0
20,2770	00006 1	12773 1	13712 1	11633 1	12777 0	04674 0	C: 43321 0	10157 0

OCTAL LISTING FOR PARAGRAPH # 122, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

20,3000	13675 1	13235 1	54161 0	54161 1	50002 0	30000 1	24002 0	50000 1
20,3010	30000 1	30006 1	13041 0	54162 0	10000 0	64753 1	13020 1	64753 1
20,3020	56161 1	00006 1	63024 1	40100 0	60161 1	00006 1	63023 1	30160 0
20,3030	00006 1	10162 0	03002 0	10160 1	10162 0	13041 0	10162 0	34735 1
20,3040	00002 0	34733 1	00002 0	C: 01240 0	C: 22512 0	C: 00141 0	C: 07416 0	C: 00030 1
20,3050	C: 21261 1	C: 00021 1	C: 03766 0	C: 00153 0	C: 07111 1	C: 00072 1	C: 24103 0	C: 00135 0
20,3060	C: 11511 1	C: 04754 1	C: 77142 0	C: 00061 0	C: 00217 0	C: 00464 1	C: 75642 0	C: 00536 1
20,3070	C: 75705 1	C: 00061 0	C: 77616 0	C: 05154 1	C: 00052 0	C: 00231 1	C: 77174 0	C: 01400 1
20,3100	C: 01000 0	C: 06000 1	C: 04000 0	C: 22146 0	C: 13241 1	C: 00337 0	C: 26501 1	C: 51276 0
20,3110	C: 62362 1	34753 1	54160 1	34752 1	54161 0	50160 0	33216 1	00006 1
20,3120	71326 0	00006 1	71327 1	50160 0	63217 0	54154 0	13132 0	54161 0
20,3130	00006 1	26161 1	50161 1	33221 0	00006 1	50161 1	71326 0	50160 0
20,3140	63223 1	00006 1	50161 1	71326 0	26154 0	10161 0	13127 1	10160 1
20,3150	13157 0	C: 00000 1	C: 20354 1	30154 1	54155 1	34757 0	13112 1	33216 1
20,3160	22007 0	03002 0	C: 01243 0	55530 1	34733 1	55551 1	55571 1	55572 1
20,3170	55611 1	55612 1	00006 1	33152 1	00006 1	10155 1	00004 0	55531 0
20,3200	55532 0	33107 1	55627 1	33106 0	55630 1	31243 0	00006 1	70154 0
20,3210	00006 1	71245 1	03002 0	C: 00155 0	55511 1	12716 1	C: 00167 1	C: 06176 1
20,3220	C: 77650 1	C: 72260 0	C: 76637 1	C: 02167 0	C: 00645 0	C: 06335 1	C: 04256 1	C: 30162 0
20,3230	C: 64072 0	C: 53632 0	C: 15133 1	C: 71777 0	55632 1	31343 1	00006 1	74737 1
20,3240	54001 1	60000 1	54115 0	41343 0	60001 0	54114 1	00004 0	31541 0
20,3250	54001 1	31537 1	04674 0	C: 37200 1	53544 1	00003 1	30111 0	74744 0
20,3260	10000 0	34753 1	54116 0	61502 1	10000 0	32767 1	54151 0	00006 1
20,3270	12274 1	10116 0	33766 0	33766 0	31530 0	64743 0	54157 0	30000 0
20,3300	03704 1	00004 0	55551 0	55552 0	44742 1	00006 1	71551 0	00006 1
20,3310	10157 0	55557 0	55560 1	34732 1	55552 1	55554 0	00003 1	22007 0
20,3320	10116 0	53544 1	34755 1	54154 0	54163 1	50154 1	11543 0	64753 1
20,3330	13333 0	64753 1	24163 0	54162 0	40162 1	54164 0	31343 1	54143 0
20,3340	54144 1	30162 1	63770 1	00006 1	63436 0	10151 0	13376 1	31243 1
20,3350	50164 1	26144 1	50163 0	54145 0	33233 0	60162 1	00006 1	63362 0
20,3360	40115 0	13371 0	40162 0	60000 1	60000 1	64736 1	60000 1	00006 1
20,3370	71343 0	50163 0	54143 0	30114 0	50164 1	54146 0	30162 1	00006 1

OCTAL LISTING FOR PARAGRAPH # 123, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

20,3400	74740 1	60162 1	03704 1	50164 1	54130 1	34733 1	50163 0	54127 1
20,3410	30162 1	61533 0	61533 0	64743 0	54000 0	13462 0	30162 1	00006 1
20,3420	74736 0	61533 0	54157 0	64744 1	56157 1	03704 1	00006 1	74736 0
20,3430	54160 1	33435 0	54161 0	44744 0	13737 0	13467 0	54001 1	34733 1
20,3440	54127 1	54131 1	10151 0	13462 0	33771 0	60001 0	00006 1	63457 1
20,3450	30115 1	50164 1	54146 0	60000 1	50163 0	54145 0	13462 0	31343 1
20,3460	54146 0	54145 0	30162 1	61533 0	61533 0	54157 0	03730 0	50164 1
20,3470	54134 0	30160 0	50164 1	54126 0	30162 1	61533 0	64743 0	54000 0
20,3500	13502 1	34733 1	63770 1	54157 0	03730 0	50164 1	54132 0	30160 0
20,3510	50164 1	54124 1	40162 0	61533 0	61533 0	03716 1	50163 0	54133 1
20,3520	54001 1	30160 0	50163 0	54125 0	40162 0	61533 0	54157 0	63770 1
20,3530	00006 1	63747 0	03724 0	50163 0	54131 0	30160 0	50163 0	54123 0
20,3540	50154 1	33775 1	71257 1	00006 1	13551 1	30124 0	54126 0	30132 1
20,3550	54134 0	50154 1	33773 1	71257 1	00006 1	13562 1	30123 1	54125 0
20,3560	30131 1	54132 1	40146 0	60143 1	60151 1	54147 1	40145 0	60144 0
20,3570	60151 1	54150 1	00004 0	10154 0	13616 1	30122 0	55547 1	34320 1
20,3600	05545 0	C: 30123 1	C: 01567 1	00003 1	52144 1	52136 1	52146 0	52140 0
20,3610	52150 1	52142 1	34753 1	54154 0	34755 1	13324 0	30122 0	55550 1
20,3620	34320 1	05545 0	C: 30123 1	C: 01607 1	52152 0	52556 1	31343 1	55561 0
20,3630	55562 0	61555 0	55564 0	55563 1	34755 1	55565 1	55566 1	11555 1
20,3640	13656 0	52136 1	53602 0	52140 0	53604 0	52142 1	53606 1	52144 1
20,3650	53622 1	52146 0	53624 1	52150 1	53626 0	13676 1	31343 1	55601 0
20,3660	55612 0	55621 1	55622 1	61555 0	55603 1	55604 0	55623 0	55624 1
20,3670	34755 1	55605 1	55606 1	55625 0	55626 0	00004 0	40111 1	74751 1
20,3700	26111 1	00003 1	30117 0	04640 1	54165 1	34743 0	22007 0	00006 1
20,3710	10165 1	00002 0	34755 1	55502 0	55623 1	12777 0	22007 0	22122 0
20,3720	64157 0	63770 1	00006 1	63744 0	31157 1	00006 1	50164 1	70130 1
20,3730	64743 0	56157 1	00006 1	22161 1	03704 1	54160 1	44743 1	00006 1
20,3740	70160 1	00006 1	10157 0	00161 1	43770 0	54157 0	13725 0	10163 1
20,3750	34752 0	67752 0	54122 1	60154 1	50000 1	33774 0	71257 1	00006 1
20,3760	13764 0	43770 0	54157 0	13532 1	30001 0	13533 0	C: 00110 1	C: 00443 1
20,3770	C: 77377 1	C: 00356 1	C: 02213 0	C: 00110 1	C: 00022 1	C: 00204 1	C: 00041 1	CKSM 67055 0

OCTAL LISTING FOR PARAGRAPH # 124, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

21,2000	C: 24402 1	C: 11551 1	C: 21357 0	C: 22316 0	C: 11507 1	C: 00547 1	40103 1	74747 0
21,2010	10000 0	15261 0	11555 1	12015 0	12125 1	55714 0	36010 0	05173 1
21,2020	C: 02006 0	34753 1	70107 0	00006 1	12030 1	24747 1	54001 1	04606 0
21,2130	34752 0	701 7 0	00006 1	12037 0	34751 0	54001 1	04606 0	30105 0
21,2140	74743 1	00006 1	12145 1	41010 0	62104 0	00006 1	12145 1	00006 1
21,2050	00000 0	40000 0	54001 1	74750 0	10000 0	12073 0	41010 0	62103 1
21,2160	00006 1	12145 1	30001 0	74753 0	10000 0	12071 0	12145 1	02105 1
21,2170	44755 0	12074 1	12105 1	34752 0	54002 1	00004 0	00006 1	32102 0
21,2100	52006 0	C: 03401 0	C: 12067 0	C: 00106 0	C: 00107 1	40774 1	61010 1	00006 1
21,2110	12121 0	40105 1	74743 1	10000 0	12121 0	30103 0	74747 0	10000 0
21,2120	00002 0	04364 1	04457 0	04635 0	C: 21051 0	40107 0	74725 0	00006 1
21,2130	12141 0	4 117 0	74742 0	00006 1	12141 0	37723 0	05072 1	C: 03571 1
21,2140	C: 70067 1	00006 1	34755 1	52754 0	12021 1	23714 1	40025 1	53055 1
21,2150	40103 1	74741 0	10000 0	13044 0	31300 0	74745 1	10000 0	12231 1
21,2160	02315 1	41300 1	74745 1	27300 1	34752 0	00006 1	05014 1	31743 0
21,2170	00006 1	71706 0	56070 0	31744 1	00006 1	71707 1	26070 1	31745 0
21,2200	00006 1	71711 1	26070 1	32000 0	00006 1	71070 1	20001 1	20001 1
21,2210	56070 0	31716 0	00006 1	71715 1	60070 0	55711 0	41711 0	00006 1
21,2220	62222 1	12224 1	31711 1	64735 1	54060 0	34751 0	00006 1	05014 1
21,2230	15261 0	02315 1	44745 1	71300 1	55300 1	44752 1	00006 1	03014 1
21,2240	11741 0	12245 1	12245 1	12262 0	55741 0	44753 0	53742 0	53713 1
21,2250	34742 1	56002 0	22007 0	31715 0	00006 1	12002 1	00006 1	72002 0
21,2260	12264 1	53713 1	12304 0	32001 1	00006 1	71711 0	20001 1	61713 0
21,2270	55713 1	34755 1	27712 0	34723 1	64752 1	61713 0	55713 1	34755 1
21,2300	64733 1	61712 1	55712 0	13041 0	11713 1	12311 1	12311 1	34755 1
21,2310	55713 1	11712 0	34735 1	61713 0	12224 0	00006 1	23714 1	34746 0
21,2320	00006 1	02000 0	10000 0	13044 0	40075 1	74726 0	00006 1	12265 1
21,2330	40075 1	74726 0	26075 1	44745 1	71300 1	55300 1	40074 0	74752 1
21,2340	00006 1	15261 0	34744 1	00006 1	05012 1	24755 1	55702 1	55703 0
21,2350	55676 0	55677 1	34750 1	05173 1	C: 02356 0	15261 0	34752 0	00006 1
21,2360	05012 1	41500 1	74744 0	27300 1	15261 0	41234 1	60025 0	64736 1
21,2370	64736 1	57715 0	34777 1	54065 0	00006 1	31236 1	20001 1	20001 1

OCTAL LISTING FOR PARAGRAPH # 125, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

21,2400	00006 1	71715 1	00006 1	10065 0	57706 1	00006 1	31527 0	20001 1
21,2410	20001 1	27706 0	30037 0	61157 0	00006 1	72004 0	27706 0	00006 1
21,2420	31240 0	20001 1	20001 1	00006 1	71715 1	00006 1	10065 0	57707 0
21,2430	00006 1	21521 1	20001 1	20001 1	27707 1	30040 0	61160 1	00006 1
21,2440	72004 0	27717 1	00006 1	21242 1	20001 1	20001 1	00006 1	71715 1
21,2450	00006 1	10065 0	57710 0	00006 1	31533 0	20001 1	20001 1	27710 1
21,2460	30041 1	61161 0	00006 1	72004 0	27710 1	34751 0	05224 0	40074 0
21,2470	74752 1	10000 0	12474 0	01714 1	21722 1	61706 1	54061 1	31735 1
21,2500	61707 0	54062 1	31737 0	61710 0	54063 0	20061 0	00006 1	71717 0
21,2510	56070 0	31062 1	00006 1	71721 0	26070 1	30063 1	00006 1	71723 1
21,2520	26073 1	30070 0	00000 1	57704 0	30061 0	00006 1	71725 1	56070 0
21,2530	30062 0	00006 1	71727 0	26070 1	30063 1	00006 1	71731 1	26070 1
21,2540	30070 0	60000 1	57705 1	35015 0	54003 0	21417 1	54063 0	31420 0
21,2550	54064 1	35016 0	54003 0	30064 0	00006 1	71704 1	56070 0	20063 1
21,2560	00006 1	71705 0	26070 1	32003 0	00006 1	70070 1	20001 1	57700 1
21,2570	30064 0	00006 1	71705 0	56070 0	30063 1	00006 1	71704 1	40000 0
21,2600	26070 1	32003 0	00006 1	70070 1	20001 1	57701 0	42005 1	54066 0
21,2610	34753 1	54065 0	50065 1	11700 0	12620 0	12721 0	12626 0	12721 0
21,2620	50065 1	41700 0	62005 0	00006 1	62634 1	12721 0	50065 1	31700 1
21,2630	62005 0	00006 1	62634 1	12721 0	50065 1	11676 0	12642 1	12653 1
21,2640	12647 1	12653 1	50065 1	31700 1	00006 1	62672 0	12653 1	50065 1
21,2650	41700 0	00006 1	62707 0	50065 1	11702 1	12665 1	12660 1	12703 0
21,2660	50065 1	31700 1	00006 1	62711 1	12674 1	50065 1	31700 1	00006 1
21,2670	62672 0	12674 1	42005 1	13015 1	50065 1	41676 0	62005 0	50065 1
21,2700	56072 1	34753 1	13020 1	50065 1	31700 1	00006 1	62711 1	32005 0
21,2710	13015 1	50065 1	31676 1	62005 0	40000 0	50065 1	56072 1	44753 0
21,2720	12020 1	50065 1	11702 1	12752 1	12726 1	12757 1	50065 1	41676 0
21,2730	00006 1	62723 1	12766 0	50065 1	41700 0	00006 1	63011 1	60066 1
21,2740	50065 1	61676 1	00006 1	63011 1	50065 1	61700 1	00006 1	50065 1
21,2750	61676 1	13015 1	50065 1	41700 0	00006 1	63011 1	12763 0	50065 1
21,2760	31700 1	00006 1	63011 1	50065 1	41676 0	13015 1	50065 1	31700 1
21,2770	00006 1	63011 1	32005 0	50065 1	61676 1	40000 0	50065 1	61700 1

OCTAL LISTING FOR PARAGRAPH # 126, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

21,3000	00006 1	63011 1	90006 1	50065 1	61700 1	50065 1	61676 1	40000 C
21,3010	13115 1	50065 1	41676 C	50065 1	61700 1	50065 1	56072 1	34755 1
21,3020	50065 1	56712 1	50065 1	30072 1	64754 0	50065 1	54053 C	50065 1
21,3030	30072 1	50065 1	27676 C	10065 0	12611 1	35021 0	00006 1	05014 1
21,3040	01714 1	34755 1	54001 1	12261 1	40074 0	74752 1	00006 1	13060 0
21,3050	34744 1	71300 1	10000 0	34752 C	64744 1	40000 C	00006 1	03012 1
21,3060	43167 1	71300 1	55060 1	44736 C	70075 1	54075 1	15261 C	C: 00000 1
21,3070	37752 0	55631 0	34751 0	55535 1	55526 1	34752 C	55632 1	55632 0
21,3100	55634 0	30021 1	60000 1	55505 1	34752 0	13107 0	34755 1	55150 C
21,3110	51751 1	31527 1	00006 1	74752 1	00006 1	13121 1	50000 1	44734 1
21,3120	56001 0	11750 0	51100 1	21436 1	53744 0	51750 1	31524 1	55741 0
21,3130	00006 1	13667 1	51750 1	31450 1	00006 1	71741 0	23727 0	00006 1
21,3140	74747 0	53740 1	00006 1	74747 C	27740 1	41744 C	00006 1	74736 0
21,3150	00006 1	71744 0	61741 1	00006 1	63171 0	00006 1	40001 1	61741 1
21,3160	00006 1	11741 0	57746 C	30001 C	22007 0	00006 1	11741 0	57747 1
21,3170	13174 1	34733 1	54001 1	52747 C	31743 0	00006 1	74743 1	53743 1
21,3200	00006 1	21743 0	53752 1	31744 1	00006 1	63211 0	00006 1	31747 1
21,3210	13213 1	00006 1	41747 C	21752 1	11751 1	13221 1	13220 C	13223 0
21,3220	11752 1	34753 1	13224 1	44753 0	55745 1	11745 1	13240 C	13231 C
21,3230	13235 1	55742 C	55743 1	13240 0	C: 65252 1	00006 1	41743 1	53743 1
21,3240	00006 1	31747 1	21743 1	31746 C	00006 1	73234 0	53747 C	30001 0
21,3250	00006 1	73234 C	27747 0	54001 1	13256 1	27746 1	00006 1	31743 C
21,3260	21747 0	00006 1	00006 1	71744 C	21740 1	31747 1	00006 1	71744 0
21,3270	27740 1	54001 1	13274 1	27737 1	31742 1	00006 1	71741 C	53752 1
21,3300	31743 0	00006 1	71741 C	27752 1	54001 1	13307 1	27751 1	11745 1
21,3310	13515 1	13557 1	13314 C	13557 1	00006 1	41743 1	53743 1	13515 1
21,3320	C: 23146 1	34753 1	55502 0	34752 C	22002 0	22071 1	13330 C	34755 1
21,3330	54066 0	50066 1	31507 1	00006 1	63404 1	54063 0	50066 1	41537 C
21,3340	00006 1	13404 0	54002 1	00006 1	73320 1	60002 0	54001 1	13354 1
21,3350	40000 0	50066 1	57501 1	13410 0	00006 1	63362 0	40000 0	54062 1
21,3360	44753 0	13364 1	54062 1	34753 1	50066 1	55501 0	30063 1	00006 1
21,3370	74740 1	60062 0	00006 1	63410 1	40062 1	00006 1	73421 C	00006 1

OCTAL LISTING FOR PARAGRAPH # 127, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" FENGLES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

21,3400	10060 0	00006 1	13404 0	13416 0	34755 1	50066 1	55501 0	13420 0
21,3410	36010 0	50066 1	55622 0	34755 1	55502 0	13420 0	50066 1	55632 0
21,3420	10066 0	13427 0	52073 1	52063 0	04674 0	C: 35742 0	52063 0	52073 1
21,3430	00071 1	C: 0240 1	11751 1	13451 0	13436 1	13442 1	31752 0	00006 1
21,3440	63442 0	13445 0	34755 1	55741 0	00002 0	57751 0	57752 0	34757 0
21,3450	13452 0	34755 1	55741 0	35741 0	55744 0	13464 0	31751 0	13500 0
21,3460	37751 0	27744 0	00006 1	63456 0	41751 1	51744 1	64735 1	00006 1
21,3470	63460 0	51744 1	34735 1	57747 1	00006 1	31752 0	00006 1	11747 0
21,3500	00006 1	23752 0	00006 1	74736 0	55747 0	74737 1	10000 0	33625 0
21,3510	63623 0	03627 1	03627 1	03627 1	01752 0	03432 1	57742 1	00006 1
21,3520	71742 0	53743 1	00006 1	70001 1	27742 1	54001 1	13530 0	27742 0
21,3530	21744 1	00006 1	74736 0	27741 0	00006 1	13554 1	51741 1	34735 1
21,3540	57742 1	00006 1	71742 0	21740 1	57742 1	00006 1	71743 1	27740 1
21,3550	54001 1	13553 0	27737 1	13557 1	00006 1	31743 0	21740 1	11737 1
21,3560	13564 1	13563 0	13566 0	11740 1	34753 1	13567 1	44753 0	54001 1
21,3570	51750 1	57501 1	00006 1	70001 1	10001 1	13612 0	13607 1	13601 1
21,3600	13607 1	51750 1	55510 0	51750 1	43624 0	00006 1	03012 1	41262 1
21,3610	74747 0	27262 1	11750 0	13106 1	31505 0	54021 0	00006 1	33622 1
21,3620	52006 0	C: 13270 1	C: 36106 0	C: 26501 1	C: 01400 1	C: 11276 1	C: 06000 1	55746 1
21,3630	54021 0	31747 1	22007 0	00006 1	11746 1	60021 1	00002 0	34755 1
21,3640	55537 0	55541 1	55424 0	55425 1	04616 1	C: 40465 1	05155 0	C: 00632 0
21,3650	24736 1	51505 0	55525 0	11745 1	13674 0	13677 0	51505 0	41525 0
21,3660	10000 0	00002 0	13664 1	13664 1	51505 0	33706 0	51505 0	55770 1
21,3670	34755 1	51505 0	55525 0	00002 0	51505 0	21525 1	13660 0	51505 0
21,3700	11770 1	13703 1	00002 0	13670 1	00002 0	C: 00004 0	C: 00012 1	C: 00012 1
21,3710	44753 0	55745 1	31427 1	13717 1	34753 1	55745 1	41427 0	22000 1
21,3720	40111 1	74744 0	10000 0	34767 0	60001 0	00006 1	63736 0	13650 1
21,3730	51505 0	11525 0	13714 1	13735 1	13710 0	55745 1	31427 1	00006 1
21,3740	74766 0	10000 0	13761 0	13745 0	13650 0	31427 1	61752 0	00006 1
21,3750	71411 0	00006 1	13767 0	00006 1	63763 0	31427 1	63647 1	00006 1
21,3760	63767 1	44736 0	13651 1	43647 0	61427 1	00006 1	63650 1	34755 1
21,3770	13651 1	C: 03771 0	C: 03772 0	CKSM 46470 0	a	a	a	a

OCTAL LISTING FOR PARAGRAPH # 13), WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

22,2000	C: 27533 1	C: 17571 0	C: 25704 1	C: 06702 1	06042 1	I: 77624 0	C: 44403 0	C: 03277 0
22,2010	I: 51535 0	C: 11324 1	I: 51025 1	C: 04403 1	C: 44724 0	I: 72364 0	C: 03246 1	C: 03277 0
22,2020	I: 77624 1	C: 4441 1	I: 72364 0	C: 02230 1	C: 00322 1	I: 77624 1	C: 44410 1	I: 45160 1
22,2030	C: 03246 1	C: 44326 1	I: 45575 1	C: 51457 1	I: 77626 0	C: 50465 0	I: 77626 0	C: 74473 1
22,2040	I: 75160 1	C: 03313 1	C: 02230 1	I: 77624 1	C: 44312 1	I: 45575 1	C: 51532 1	I: 77626 0
22,2050	C: 51540 1	I: 77626 0	C: 75546 1	I: 45001 1	C: 03023 0	C: 44335 1	I: 45575 1	C: 50457 1
22,2060	I: 77626 0	C: 50465 0	I: 77626 0	C: 74473 1	I: 45345 1	C: 03306 1	C: 02233 1	I: 45325 1
22,2070	C: 02235 1	C: 03311 0	I: 45325 1	C: 03316 0	C: 02243 0	I: 77666 1	C: 03326 0	I: 43345 1
22,2100	C: 02231 0	C: 02251 0	I: 43225 0	C: 06514 1	C: 02241 1	C: 03334 0	I: 77726 1	C: 03336 1
22,2110	I: 51025 1	C: 04363 0	C: 44117 0	I: 77751 1	C: 00322 1	C: 37236 1	C: 44742 0	I: 45345 1
22,2120	C: 03336 1	C: 04365 0	I: 77244 0	C: 44131 1	C: 03326 0	I: 77656 1	C: 03271 0	I: 77650 1
22,2130	C: 44744 0	I: 53375 0	C: 02231 0	C: 03304 0	I: 77762 1	C: 27304 0	C: 02237 0	I: 74455 0
22,2140	C: 03312 1	C: 27312 1	C: 02245 0	I: 74455 0	C: 03320 0	C: 03320 0	I: 70545 1	C: 03334 0
22,2150	I: 45325 1	C: 06522 1	C: 03334 0	I: 65204 1	C: 21713 1	C: 03324 1	I: 56225 1	C: 00001 0
22,2160	C: 00003 1	I: 65366 1	C: 03314 1	I: 56225 1	C: 00001 0	C: 00003 1	I: 65366 1	C: 03304 0
22,2170	I: 56225 1	C: 00001 0	C: 00003 1	I: 55566 1	I: 77656 1	C: 03271 0	I: 45345 1	C: 03271 0
22,2200	C: 03273 1	I: 71240 1	C: 44211 0	C: 03271 0	I: 50025 0	C: 03275 1	C: 44266 0	I: 77650 1
22,2210	C: 44242 0	I: 45345 1	C: 03273 1	C: 03275 1	I: 77640 0	C: 44266 0	I: 51145 0	C: 03230 1
22,2220	C: 44224 0	I: 57575 1	C: 03271 0	C: 03271 0	I: 51145 0	C: 03306 1	C: 44232 1	I: 57545 1
22,2230	C: 03271 0	C: 03271 0	I: 51145 0	C: 03316 0	C: 44744 0	I: 57545 1	C: 03275 1	C: 03275 1
22,2240	I: 77650 1	C: 44744 0	I: 51145 0	C: 03326 0	C: 44250 0	I: 57575 1	C: 03271 0	C: 03271 0
22,2250	I: 51145 0	C: 03306 1	C: 44256 0	I: 57545 1	C: 03273 1	C: 03273 1	I: 51145 0	C: 03310 0
22,2260	C: 44744 0	I: 57545 1	C: 03275 1	C: 03275 1	I: 77650 1	C: 44744 0	I: 51145 0	C: 03332 0
22,2270	C: 44274 0	I: 57575 1	C: 03271 0	C: 03271 0	I: 51145 0	C: 03310 0	C: 44302 0	I: 57545 1
22,2300	C: 03271 0	C: 03271 0	I: 51145 0	C: 03316 0	C: 44744 0	I: 57545 1	C: 03273 1	C: 03273 1
22,2310	I: 77650 1	C: 44744 0	I: 76601 1	C: 00001 0	C: 00001 0	I: 62703 1	C: 77776 1	C: 00007 0
22,2320	I: 62703 1	C: 77776 1	C: 00015 0	I: 41503 1	C: 77776 1	I: 77616 0	I: 76601 1	C: 00001 0
22,2330	C: 00001 0	I: 62713 0	C: 00007 0	C: 00015 0	I: 77606 1	I: 77776 1	50120 1	52013 1
22,2340	50120 1	52017 0	50120 1	52013 1	50120 1	52015 1	50120 1	52005 0
22,2350	50120 1	52015 1	50120 1	52003 0	50120 1	52007 1	50120 1	52003 0
22,2360	06042 1	I: 77616 0	C: 00013 0	C: 13563 0	C: 17070 0	C: 34343 1	C: 15666 0	C: 20443 0
22,2370	C: 33555 1	C: 01116 1	C: 67777 1	C: 77777 0	C: 04000 0	C: 00000 1	C: 00216 1	C: 36323 0

OCTAL LISTING FOR PARAGRAPH # 131, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

22,2400	C: 17773 1	C: 00057 0	C: 14344 1	30034 0	54156 I	00006 1	30033 1	16501 I
22,2410	I: 66371 0	C: 00013 1	C: 00051 0	C: 00001 0	C: 00010 0	I: 77601 0	C: 00001 0	I: 47123 0
22,2420	C: 00013 0	C: 21577 1	C: 00013 0	I: 65356 1	C: 00013 0	I: 41546 0	I: 71300 1	C: 44417 0
22,2430	C: 00007 0	I: 72405 0	C: 00013 0	C: 10001 1	I: 41345 0	C: 00005 1	C: 00001 0	I: 41325 0
22,2440	C: 00017 0	C: 00011 1	I: 72405 0	C: 00003 1	I: 72421 0	C: 00015 0	C: 10003 0	I: 41345 0
22,2450	C: 00013 1	C: 00005 1	I: 41325 0	C: 00007 0	C: 00011 1	I: 72405 0	C: 00001 0	I: 72415 1
22,2460	C: 00017 1	C: 10015 0	I: 77745 1	C: 00011 1	C: 10007 1	I: 77745 1	C: 00013 0	I: 72405 0
22,2470	C: 00013 1	C: 10011 0	I: 41345 0	C: 00013 0	C: 00001 0	I: 72476 1	C: 10013 1	I: 41345 0
22,2500	C: 00005 1	C: 00013 0	I: 72476 1	C: 10015 1	I: 77745 1	I: 72405 0	C: 00011 1	I: 41325 0
22,2510	C: 00007 0	C: 00011 0	I: 72415 1	C: 77601 0	I: 77745 1	I: 72405 0	C: 00011 1	C: 00011 1
22,2520	I: 41325 0	C: 00007 1	C: 00003 1	I: 72425 1	I: 77626 0	C: 67756 1	I: 77616 0	I: 41401 1
22,2530	C: 00001 0	I: 65356 1	I: 41546 0	I: 65302 0	I: 41021 1	C: 06522 1	C: 21713 1	I: 77725 1
22,2540	C: 03271 0	I: 41316 0	C: 00005 1	I: 52415 0	C: 00003 1	I: 77604 0	C: 21713 1	C: 16231 0
22,2550	C: 03273 1	I: 41316 0	C: 00005 1	I: 52415 0	C: 00003 1	I: 77604 0	C: 21713 1	C: 16241 1
22,2560	C: 03275 1	I: 41316 0	C: 00005 1	I: 52415 0	C: 00003 1	I: 77604 0	C: 21713 1	C: 02251 0
22,2570	I: 41345 0	C: 03271 0	C: 03273 1	I: 72405 0	C: 00005 1	I: 41325 0	C: 03275 1	C: 00001 0
22,2600	I: 43216 1	C: 00007 0	I: 41112 0	C: 21713 1	C: 16237 0	I: 62421 1	I: 77604 0	C: 21713 1
22,2610	C: 16233 1	C: 03271 0	I: 41205 0	C: 03275 1	C: 00005 1	I: 65352 0	C: 03273 1	I: 41405 0
22,2620	C: 00001 0	I: 62415 0	C: 00007 0	I: 77604 0	C: 21713 1	C: 16235 1	I: 62421 1	I: 77604 0
22,2630	C: 21713 1	C: 16245 0	C: 03273 1	I: 41205 0	C: 03275 1	C: 00005 1	I: 65352 0	C: 03271 0
22,2640	I: 41405 0	C: 00001 0	I: 62415 0	C: 00007 0	I: 77604 0	C: 21713 1	C: 16247 1	I: 62421 1
22,2650	I: 77614 0	C: 21713 1	C: 02243 0	I: 77616 0	I: 67543 1	C: 00007 0	I: 71406 0	I: 41152 1
22,2660	C: 21713 1	C: 00005 0	I: 57543 1	C: 00015 0	I: 67471 1	C: 00051 0	I: 51123 0	C: 00001 0
22,2670	C: 44712 1	I: 57545 1	I: 43244 1	C: 44677 1	C: 06522 1	I: 77650 1	C: 44701 1	I: 77625 0
22,2700	C: 06522 1	I: 77606 1	I: 57543 1	C: 00013 0	I: 67471 1	C: 00051 0	I: 51123 0	C: 00011 1
22,2710	C: 44722 0	I: 57545 1	I: 43244 1	C: 44717 0	C: 06522 1	I: 77650 1	C: 44723 1	I: 52025 1
22,2720	C: 06522 1	C: 44723 1	I: 77745 1	I: 43466 1	I: 77776 1	05567 0	C: 00401 1	12732 1
22,2730	04616 1	C: 44715 0	04616 1	C: 40166 1	34752 0	00004 0	05203 0	C: 03234 1
22,2740	C: 44066 1	15155 1	I: 77776 1	12732 1	I: 77614 1	C: 01074 0	I: 70740 0	C: 01322 0
22,2750	C: 04772 1	I: 45002 1	C: 44527 1	I: 74343 0	C: 04772 1	C: 03271 0	C: 17326 0	C: 03336 1
22,2760	I: 55615 1	C: 05002 0	C: 04772 1	I: 77661 0	C: 02606 0	C: 03334 0	I: 77614 1	C: 01035 0
22,2770	C: 45010 1	C: 00221 0	C: 24255 0	C: 00554 0	C: 02660 0	C: 02660 0	C: 13301 1	C: 16161 0

OCTAL LISTING FOR PARAGRAPH # 132, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

22,3000	C: 30707 1	C: 00013 1	C: 04000 0	04616 1	C: 54266 1	10000 0	12730 C	06042 1
22,3010	I: 75160 1	C: 03246 1	C: 02230 1	I: 77624 1	C: 44312 1	I: 45575 1	C: 50514 1	I: 77626 C
22,3020	C: 53522 1	I: 77626 0	C: 74530 1	I: 45160 1	C: 03246 1	C: 44654 C	I: 77634 0	C: 21621 1
22,3030	C: 03304 0	I: 77414 0	C: 01215 0	C: 45122 1	34752 0	55261 1	51261 0	31676 1
22,3040	00006 1	51261 0	21703 C	00006 1	73121 1	10000 0	64753 1	12051 1
22,3050	40000 0	51261 0	55640 0	51261 0	31702 1	51261 0	57676 1	51261 0
22,3060	55635 1	11261 1	13035 0	00003 1	03075 0	12170 0	34753 1	00004 C
22,3070	05203 0	C: 03213 1	C: 44066 1	00003 1	15155 1	00006 1	40025 1	53710 1
22,3100	00006 1	31734 0	21710 1	11707 1	00002 0	13107 C	13117 1	11710 1
22,3110	00002 0	13113 C	40000 0	63166 0	00006 1	63117 0	24002 C	24002 0
22,3120	00002 0	C: 03146 1	I: 77776 1	00006 1	30025 0	21734 1	00006 1	43166 1
22,3130	21734 1	00004 0	34752 0	55701 1	60300 1	55702 1	50000 1	31725 C
22,3140	51701 1	55643 C	00006 1	63145 1	40000 0	00006 1	73167 0	00006 1
22,3150	51702 0	71725 1	00006 1	51701 C	11520 1	51701 0	55274 C	11701 1
22,3160	13133 1	30025 0	63166 0	57706 1	13034 1	C: 00000 1	C: 00144 C	C: 75777 1
22,3170	40025 1	61706 1	10000 0	64753 1	13177 1	64735 1	40000 0	00004 C
22,3200	05203 0	C: 03206 0	C: 44066 1	33166 0	27706 0	15155 1	37717 1	05105 0
22,3210	C: 03203 1	C: 44066 1	05261 1	34755 1	55642 1	55645 0	55276 1	55641 1
22,3220	55644 1	55275 1	30323 0	55637 0	30322 1	55636 1	30321 1	55635 1
22,3230	34755 1	55643 C	55640 0	55274 0	31306 0	54063 0	34755 1	53205 1
22,3240	05116 1	05261 1	06042 1	I: 52014 C	C: 03712 0	C: 45465 1	C: 45247 1	I: 77776 1
22,3250	34752 0	55050 1	34753 1	55051 0	33316 0	04616 1	C: 20334 1	05472 0
22,3260	03262 1	03254 1	34750 1	05203 0	C: 03430 0	C: 44064 0	00003 1	33320 C
22,3270	54003 0	34755 1	55537 0	35021 1	05105 0	C: 03321 1	C: 44064 0	00003 1
22,3300	36250 0	71537 0	10000 0	03310 0	34777 1	04616 1	C: 01736 1	03300 1
22,3310	33317 1	04616 1	C: 20334 1	05563 1	05563 1	03267 1	C: 01014 0	C: 04054 1
22,3320	C: 02140 0	06042 1	I: 77634 0	C: 21574 1	C: 00041 1	C: 22205 1	I: 77776 1	41051 0
22,3330	64753 1	00006 1	13356 0	06042 1	I: 77624 1	C: 27044 1	I: 77775 1	C: 00001 C
22,3340	C: 26207 0	C: 00007 0	C: 2215 C	I: 77743 1	C: 73774 1	C: 00037 0	I: 77743 1	C: 72411 0
22,3350	C: 02201 0	I: 46135 1	C: 00050 1	C: 45367 1	I: 77650 1	C: 45373 1	06042 1	I: 77624 1
22,3360	C: 27060 1	I: 77650 1	C: 45236 0	C: 00001 0	C: 11530 1	C: 00002 0	C: 31230 1	I: 43145 0
22,3370	C: 06340 0	C: 03635 1	C: 45277 0	I: 51575 1	C: 02023 1	I: 77614 1	C: 03475 1	C: 36203 0

OCTAL LISTING FOR PARAGRAPH # 133, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

22,3400	C: 45551 1	I: 45234 0	C: 21574 1	C: 02205 1	C: 02205 1	I: 53145 1	C: 02143 0	C: 45420 0
22,3410	I: 43345 1	C: 02143 0	C: 02205 1	C: 02143 0	I: 77776 1	34753 1	55537 0	05155 0
22,3420	I: 43345 1	C: 02141 1	C: 02205 1	C: 02141 1	I: 77776 1	34752 0	55537 0	05155 0
22,3430	34747 1	71143 0	10000 0	03441 0	37716 0	05072 1	C: 05472 0	C: 04062 1
22,3440	05261 1	34777 1	05203 0	C: 03430 0	C: 44064 0	36250 0	71537 0	50000 1
22,3450	03451 1	05261 1	03460 0	34777 1	54001 1	34755 1	21541 1	05261 1
22,3460	34777 1	54001 1	34755 1	21543 0	05261 1	I: 77776 1	35021 1	05105 0
22,3470	C: 03503 1	C: 44064 0	00003 1	10067 1	05122 0	33317 1	04616 1	C: 20334 1
22,3500	05563 1	05563 1	03475 1	06042 1	I: 52175 0	C: 01220 0	C: 45507 1	C: 26207 0
22,3510	C: 01226 0	C: 02215 0	I: 52014 0	C: 04304 1	C: 45516 1	C: 45527 0	I: 71214 0	C: 03475 1
22,3520	C: 04001 1	C: 14037 0	C: 05364 0	C: 26201 0	C: 02023 1	I: 52046 1	C: 45536 0	I: 71214 0
22,3530	C: 03675 0	C: 04037 0	C: 14037 0	C: 05366 1	C: 16201 0	C: 06340 0	C: 36203 0	C: 45551 1
22,3540	I: 77776 1	34747 1	71043 0	00006 1	15472 1	34777 1	04616 1	C: 01736 1
22,3550	03503 1	I: 44001 0	C: 00001 0	C: 00051 0	I: 77214 0	C: 03755 0	C: 45565 0	C: 02207 0
22,3560	I: 77752 1	C: 26207 0	C: 02215 0	I: 77752 1	C: 02215 0	I: 77624 1	C: 57361 1	I: 77624 1
22,3570	C: 57427 1	I: 77625 0	C: 02203 1	I: 64414 1	C: 03755 0	C: 45576 1	I: 77624 1	C: 45636 0
22,3600	C: 16120 0	C: 00017 1	I: 77625 0	C: 02203 1	C: 00161 1	I: 64414 1	C: 03755 0	C: 45610 1
22,3610	I: 77624 1	C: 45636 0	C: 16122 1	C: 00161 1	I: 51025 1	C: 02201 0	C: 45622 0	I: 52145 0
22,3620	C: 06524 1	C: 45626 1	I: 45145 0	C: 00017 1	C: 57465 1	I: 77676 0	C: 16143 0	C: 02201 0
22,3630	I: 45015 1	C: 02203 1	C: 57473 0	I: 77676 0	C: 36141 0	C: 00051 0	I: 51025 1	C: 05646 0
22,3640	C: 45643 1	I: 43415 1	C: 05646 0	I: 43545 1	C: 05646 0	C: 01065 0	C: 05603 1	C: 00021 1
22,3650	C: 14161 1	C: 01440 0	C: 00000 1	C: 14000 1	C: 00000 1	C: 30000 1	C: 00000 1	C: 77534 0
22,3660	C: 45074 1	31234 0	55074 1	05504 0	C: 00036 1	04616 1	C: 17302 0	44743 1
22,3670	00006 1	03011 1	05227 1	C: 00005 1	C: 05022 1	C: 20000 0	06042 1	I: 43014 0
22,3700	C: 01464 0	C: 03664 1	I: 45014 0	C: 03267 1	C: 27465 0	I: 77414 0	C: 03671 1	04635 0
22,3710	C: 10116 0	I: 51575 1	C: 02643 1	C: 24045 0	C: 02651 1	I: 41446 1	I: 50025 0	C: 00045 0
22,3720	C: 45723 1	I: 45545 1	C: 77732 1	I: 51575 1	C: 02657 1	I: 45206 1	C: 00045 0	I: 71240 1
22,3730	C: 45733 1	I: 77626 0	C: 77732 1	I: 66145 1	C: 00045 0	I: 62101 0	C: 00044 1	C: 00047 1
22,3740	C: 00002 0	I: 53775 1	C: 02643 1	C: 20201 0	C: 26643 1	C: 02651 1	I: 77657 0	C: 20201 0
22,3750	C: 26651 1	C: 02657 1	I: 66057 0	C: 20201 0	C: 00045 0	C: 02657 1	I: 54150 1	C: 02103 1
22,3760	C: 00045 0	I: 77660 1	C: 00045 0	I: 70130 1	C: 02103 1	C: 00045 0	I: 40270 0	C: 00044 1
22,3770	C: 00003 1	I: 77650 1	C: 46671 0	C: 03773 1	C: 03774 0	CKSM 21620 0	a	a

OCTAL LISTING FOR PARAGRAPH # 134, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

23,2000	04645 1	55112 0	34752 0	55051 0	36245 1	55050 1	32037 1	04616 1
23,2010	C: 20353 0	15472 1	12017 1	12016 1	34751 0	05464 1	05155 0	31051 1
23,2020	74752 1	11000 0	12026 0	05504 0	C: 00012 1	12034 0	05516 0	C: 00012 1
23,2030	5504 0	C: 00264 1	05504 0	C: 00126 1	00002 1	31112 1	14640 0	C: 01014 0
23,2040	C: 77757 1	I: 47135 1	C: 03753 0	C: 21577 1	I: 41401 1	C: 00001 0	I: 57556 0	C: 14042 0
23,2050	I: 41546 0	I: 47135 1	C: 03754 1	C: 21577 1	I: 71406 0	I: 72405 0	C: 00001 0	C: 14045 0
23,2060	I: 41356 1	I: 77752 1	C: 24041 1	C: 00041 1	I: 77616 0	C: 14025 0	C: 00155 0	I: 40234 0
23,2070	C: 21577 1	C: 00001 0	I: 73406 1	I: 77676 0	C: 14043 0	I: 41546 0	I: 47135 0	C: 00026 0
23,2100	C: 21577 1	I: 77650 1	C: 46054 1	35010 0	04616 1	C: 20477 1	15472 1	12111 0
23,2110	12113 0	05504 0	C: 00124 0	04616 1	C: 54123 0	15472 1	04645 1	55142 0
23,2120	05504 0	C: 00024 1	02152 0	04645 1	55142 0	05516 0	C: 00024 1	34750 1
23,2130	00006 1	02033 0	10000 0	12152 1	05504 0	C: 00063 1	04616 1	C: 53112 0
23,2140	04616 1	C: 17706 0	12143 1	04616 1	C: 53114 0	04616 1	C: 17706 0	12150 0
23,2150	05516 0	C: 00063 1	34747 1	70075 1	00006 1	12314 1	06042 1	I: 77775 1
23,2160	C: 06516 0	C: 03765 0	I: 43234 0	C: 21574 1	C: 15712 1	C: 34041 0	C: 51255 1	I: 77775 1
23,2170	C: 01101 0	C: 03773 1	I: 45034 0	C: 46322 0	C: 56032 0	C: 00322 1	I: 77776 1	05352 1
23,2200	C: 04022 0	34747 1	70075 1	00006 1	12314 1	04616 1	C: 54261 0	10000 0
23,2210	07202 1	06042 1	I: 45175 0	C: 01101 0	C: 47650 1	I: 45345 1	C: 00162 1	C: 06220 0
23,2220	I: 77440 1	C: 46236 1	35015 0	54003 0	00004 0	00006 1	30322 1	53636 1
23,2230	30323 0	55637 0	00003 1	35016 0	54002 0	02261 0	I: 77776 1	00004 0
23,2240	04674 0	C: 40154 0	04674 0	C: 40141 1	05516 0	C: 00124 0	05504 0	C: 00077 1
23,2250	04616 1	C: 54123 0	00004 0	04674 0	C: 40115 0	05353 1	C: 04022 0	05516 0
23,2260	C: 00077 1	30075 0	74742 0	10000 0	02305 0	11745 1	02270 0	02205 0
23,2270	55745 1	32321 0	15173 1	C: 02275 0	05155 0	37717 1	05105 0	C: 02127 1
23,2300	C: 46067 1	05261 1	04616 1	C: 54272 1	02261 0	31142 1	14640 0	32316 1
23,2310	70074 0	00006 1	15155 1	02261 0	04635 0	C: 50222 1	C: 00500 1	C: 17250 1
23,2320	C: 34602 1	C: 01137 1	00004 0	35015 0	56003 1	54070 1	31635 0	54154 0
23,2330	00006 1	31637 1	52156 1	30070 0	54002 0	00003 1	16502 1	C: 00002 0
23,2340	C: 17755 0	I: 53754 1	C: 02777 1	C: 57176 0	C: 26744 1	I: 53750 0	C: 02776 0	C: 57176 0
23,2350	C: 02655 0	I: 45020 1	C: 03463 0	C: 46367 1	C: 37671 0	C: 25704 0	I: 41401 1	C: 00003 1
23,2360	I: 65225 1	C: 03671 1	C: 00001 0	I: 45216 1	C: 03671 1	I: 52006 0	C: 03463 0	I: 41545 0
23,2370	C: 06340 0	I: 63130 0	C: 00047 1	C: 00002 0	I: 46135 1	C: 00050 1	C: 46402 0	I: 51575 1

OCTAL LISTING FOR PARAGRAPH # 135, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

23,2400	C: 12023 1	I: 77725 1	I: 43545 1	I: 77620 0	C: 03463 0	C: 37574 0	C: 27060 1	I: 77624 1
23,2410	C: 46421 1	I: 77745 1	C: 13574 1	C: 34041 0	C: 27044 1	I: 77624 1	C: 46431 0	I: 77650 1
23,2420	C: 03463 0	I: 43175 0	C: 00001 0	C: 01352 1	C: 46435 1	C: 27536 1	C: 00007 0	C: 03544 1
23,2430	I: 77616 0	I: 43175 0	C: 01001 0	C: 01252 1	C: 46425 0	C: 27552 0	C: 00007 0	C: 03560 1
23,2440	I: 77616 0	I: 53754 1	C: 02777 1	C: 57176 0	I: 63350 1	C: 02776 0	I: 63257 1	C: 57176 0
23,2450	I: 77616 0	I: 53754 1	C: 02777 1	C: 57576 1	I: 77616 0	74745 1	10000 0	44752 1
23,2460	64753 1	27745 1	15270 0	06042 1	I: 43175 0	C: 03545 0	C: 03347 1	C: 66415 1
23,2470	I: 64252 0	C: 01734 0	C: 37521 0	C: 67067 1	I: 76575 1	C: 03553 1	I: 77721 0	C: 01734 0
23,2500	C: 27527 1	C: 01726 0	I: 53435 0	C: 01720 0	C: 03720 1	I: 77776 1	00006 1	34755 1
23,2510	52754 0	04625 0	C: 66420 1	C: 10000 0	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1
23,2520	C: 00000 1	C: 20000 0	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1
23,2530	C: 00000 1	C: 37777 1	C: 37777 1	I: 77620 0	C: 02772 1	I: 66270 0	C: 00066 1	C: 00051 0
23,2540	C: 00022 1	I: 66374 1	C: 00022 1	C: 00052 0	C: 10006 1	I: 63775 1	C: 03525 0	C: 02467 0
23,2550	C: 12665 1	I: 77775 1	C: 03533 1	I: 52717 1	C: 02555 0	C: 75112 1	C: 12665 1	I: 77775 1
23,2560	C: 03541 1	I: 52717 1	C: 02643 1	C: 75112 1	C: 12665 1	I: 77700 0	C: 46567 1	I: 43104 0
23,2570	C: 46545 1	C: 02706 1	C: 46576 1	I: 77775 1	C: 06524 1	C: 02657 1	I: 77201 1	C: 00001 0
23,2600	C: 02643 1	I: 47036 1	C: 21634 0	I: 47515 0	C: 02651 1	I: 76234 0	C: 21634 0	I: 47515 0
23,2610	C: 02657 1	I: 76234 0	C: 21634 0	I: 77171 0	C: 02707 0	C: 00000 1	C: 02665 0	I: 40151 0
23,2620	C: 02717 0	C: 46622 0	C: 02670 1	I: 77654 0	C: 46633 0	I: 40112 1	C: 46633 0	C: 02670 1
23,2630	I: 52114 1	C: 00001 0	C: 46625 1	I: 61551 1	C: 02665 0	I: 75405 1	C: 02670 1	I: 76257 0
23,2640	C: 57576 1	C: 02665 0	I: 63101 1	C: 00050 1	C: 77775 1	I: 77134 1	C: 02103 1	C: 00242 0
23,2650	I: 40265 1	C: 06514 1	C: 00001 0	C: 03500 1	I: 60351 0	C: 02665 0	C: 00047 1	I: 65345 0
23,2660	C: 00155 0	C: 03547 1	I: 77701 1	C: 00051 0	I: 70460 1	C: 00051 1	I: 41471 0	I: 77650 1
23,2670	C: 45711 1	I: 77731 1	C: 00052 0	C: 00066 1	I: 60775 1	C: 02643 1	C: 75134 0	I: 77206 0
23,2700	C: 02651 1	I: 53303 1	C: 75112 1	I: 77206 0	C: 02657 1	I: 53303 1	C: 75070 1	I: 61006 0
23,2710	C: 46674 0	I: 45575 1	C: 74260 0	I: 45575 1	C: 74266 0	I: 45575 1	C: 74274 0	I: 77214 0
23,2720	C: 02706 1	C: 46724 1	C: 06524 1	C: 03517 1	I: 66374 1	C: 00022 1	C: 00052 0	C: 00006 1
23,2730	I: 77773 1	C: 74252 1	I: 53761 1	C: 00001 0	C: 20201 0	C: 12707 1	I: 77304 0	C: 46730 1
23,2740	C: 02673 1	I: 77732 1	C: 02673 1	I: 77650 1	C: 02772 1	I: 45920 1	C: 02772 1	C: 27412 0
23,2750	I: 74375 0	C: 03503 1	C: 03500 1	C: 26712 0	C: 03511 1	I: 77761 1	C: 03500 1	C: 26721 1
23,2760	C: 03517 1	I: 77761 1	C: 03500 1	C: 02727 1	I: 77776 1	22246 1	55315 0	55316 0
23,2770	34755 1	55317 1	55320 0	05353 1	C: 04022 0	05504 0	C: 00236 0	31316 1

OCTAL LISTING FOR PARAGRAPH # 136, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

23,3070	55315 0	31329 1	55317 1	66442 1	I: 73150 1	C: 01315 1	C: 01317 0	I: 70731 0
23,3080	C: 00051 0	C: 00006 1	C: 75134 0	I: 60276 1	C: 00052 0	I: 65161 1	C: 02713 0	C: 00051 0
23,3090	I: 57144 1	C: 02647 1	C: 72103 1	I: 65057 0	C: 57576 1	C: 00051 0	I: 77653 1	C: 02667 0
23,3100	C: 02735 1	I: 57543 1	C: 75134 0	I: 74301 0	C: 00052 0	C: 02721 1	I: 71124 0	C: 00051 0
23,3040	C: 00047 1	I: 53674 1	C: 02103 1	C: 57576 1	I: 52724 1	C: 00051 0	C: 02555 0	C: 02743 0
23,3050	I: 77614 1	C: 02746 0	C: 47072 1	I: 57543 1	C: 75134 0	I: 74301 0	C: 00052 0	C: 02727 1
23,3060	I: 71124 0	C: 00051 0	C: 02047 1	I: 53674 1	C: 02103 1	C: 57576 1	I: 52724 1	C: 00051 0
23,3070	C: 02643 1	C: 02751 0	I: 77624 1	I: 11226 1	I: 77776 1	31315 1	63247 0	55316 0
23,3100	31317 0	67751 0	55320 0	06042 1	I: 66350 1	C: 01315 1	C: 00051 0	C: 00006 1
23,3110	I: 77775 1	C: 02735 1	C: 06467 1	I: 77775 1	C: 02743 0	C: 06555 1	I: 77214 0	C: 02746 0
23,3120	C: 47130 0	C: 02751 0	C: 06643 0	I: 52100 1	C: 47126 1	C: 47136 0	I: 77624 0	C: 46173 0
23,3130	I: 43335 0	C: 01321 0	C: 07251 0	I: 52030 0	C: 47136 0	C: 47123 1	I: 77624 1	C: 11226 1
23,3140	I: 53375 0	C: 01701 0	C: 02701 0	C: 03472 0	I: 47014 1	C: 00707 1	C: 47236 0	C: 26771 1
23,3150	I: 77004 0	C: 57753 1	C: 00000 1	I: 77014 1	C: 04344 0	C: 47157 1	C: 00002 0	I: 53775 1
23,3160	C: 02665 0	C: 57205 1	I: 40055 0	C: 01521 0	C: 47176 1	C: 25521 0	C: 02673 1	I: 53257 1
23,3170	C: 57202 0	C: 1527 0	I: 77600 1	C: 47202 1	C: 35527 1	C: 47211 0	I: 53375 0	C: 01535 0
23,3200	C: 02665 0	C: 01535 0	I: 53375 0	C: 01543 1	C: 02673 1	C: 01543 1	I: 45134 0	C: 02030 0
23,3210	C: 27673 0	I: 77624 1	C: 11226 1	I: 47014 1	C: 00707 1	C: 47241 0	C: 26750 1	I: 77624 1
23,3220	C: 26070 1	I: 77624 1	C: 11226 1	I: 77214 0	C: 02746 0	C: 47230 0	C: 03472 0	C: 01701 0
23,3230	I: 66150 0	C: 02772 1	C: 00052 0	I: 77776 1	04635 0	C: 27423 1	I: 52034 1	C: 26724 1
23,3240	C: 47150 0	I: 45034 1	C: 26675 1	C: 26114 1	I: 77650 1	C: 47221 0	C: 00066 1	C: 77771 0
23,3250	C: 00014 1	I: 71220 1	C: 00051 0	C: 02665 0	I: 65325 0	C: 06524 1	C: 02671 0	I: 55476 1
23,3260	I: 77656 1	C: 14027 1	C: 00027 1	I: 77742 0	C: 14023 0	C: 00033 1	I: 77742 0	C: 02621 0
23,3270	C: 47322 1	C: 16742 1	C: 02667 1	I: 77742 0	C: 14023 0	C: 00027 1	I: 65205 0	C: 02671 0
23,3300	C: 00033 1	I: 45205 1	C: 02665 0	I: 77626 0	C: 43756 1	C: 47322 1	C: 26744 1	C: 00027 1
23,3310	I: 77641 1	C: 02701 0	C: 24021 1	C: 00027 1	I: 77641 1	C: 02673 1	C: 34023 1	C: 47322 1
23,3320	C: 36740 1	C: 00051 0	I: 51545 1	C: 00023 0	I: 50025 0	C: 07536 0	C: 47335 1	I: 72545 0
23,3330	C: 00021 1	I: 75326 1	C: 00023 0	C: 00025 0	I: 77616 0	I: 72545 0	C: 00023 0	I: 77736 0
23,3340	C: 14025 0	C: 00021 1	I: 77640 0	C: 47346 0	I: 43545 1	C: 00025 0	I: 75345 1	C: 06522 1
23,3350	C: 00023 0	I: 77625 0	C: 00025 0	C: 00025 0	I: 77616 0	I: 77601 0	C: 00001 0	I: 47375 0
23,3360	C: 02665 0	C: 02651 1	I: 41456 0	I: 44041 1	C: 02701 0	C: 00051 0	C: 24021 1	C: 00001 0
23,3370	I: 77641 1	C: 02673 1	C: 34023 1	C: 47322 1	C: 26740 0	C: 00001 0	I: 50235 0	C: 02665 0

OCTAL LISTING FOR PARAGRAPH # 137, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

23,3400	C: 02651 1	I: 77752 1	C: 24021 1	C: 02651 1	I: 77641 1	C: 02665 0	C: 34023 1	C: 47322 1
23,3410	C: 02744 1	I: 45246 0	C: 07540 1	I: 77644 1	C: 47433 0	I: 50375 0	C: 02657 1	C: 00001 0
23,3420	C: 24021 1	C: 02643 1	I: 45441 1	C: 43754 0	C: 47322 1	C: 26742 1	C: 02740 0	I: 77634 0
23,3430	C: 21621 1	C: 34322 0	C: 00051 0	I: 77776 1	C: 05567 0	C: 00401 1	C: 05504 0	C: 00056 1
23,3440	C: 06042 1	I: 77650 1	C: 47415 1	I: 66370 0	C: 02714 1	C: 00051 0	C: 02700 1	I: 77601 0
23,3450	C: 00001 0	I: 46773 0	C: 02723 0	C: 02731 0	I: 77656 1	C: 06731 1	I: 77773 1	C: 02723 0
23,3460	I: 76433 1	C: 02731 0	C: 06737 1	I: 77700 0	C: 47451 1	I: 66160 0	C: 00006 1	C: 00036 1
23,3470	I: 66370 0	C: 00022 1	C: 00051 0	C: 00006 1	I: 66374 1	C: 00006 1	C: 00052 0	C: 00002 0
23,3500	I: 76720 0	C: 00036 1	C: 00001 0	I: 62757 0	C: 75062 1	C: 00007 0	I: 77757 1	C: 75054 1
23,3510	C: 30031 0	C: 00015 0	I: 53357 0	C: 75046 1	I: 76455 1	C: 00031 0	I: 53520 0	C: 00036 1
23,3520	C: 06707 1	I: 77700 0	C: 47523 0	I: 77704 1	C: 47500 1	I: 77775 1	C: 02665 0	C: 26707 1
23,3530	C: 02673 1	C: 26715 0	C: 02701 0	C: 02723 0	I: 77616 0	C: 05520 0	C: 26075 1	C: 05252 1
23,3540	C: 25253 1	I: 77776 1	C: 03551 0	C: 06042 1	I: 77616 0	I: 77776 1	C: 03557 0	C: 06042 1
23,3550	I: 77616 0	C: 30122 0	C: 54771 1	C: 30033 1	C: 54765 1	C: 30034 0	C: 54767 0	C: 00006 1
23,3560	C: 22142 0	C: 34751 0	C: 76245 0	C: 54143 0	C: 50143 1	C: 30765 0	C: 52155 1	C: 52127 1
23,3570	C: 04713 0	C: 21577 1	C: 00006 1	C: 30155 0	C: 50143 1	C: 52766 1	C: 04713 0	C: 01517 0
23,3600	C: 52155 1	C: 50143 1	C: 52744 1	C: 07006 1	C: 50143 1	C: 30766 0	C: 04713 0	C: 01531 1
23,3610	C: 52127 1	C: 52155 1	C: 50143 1	C: 52736 1	C: 10143 0	C: 13562 1	C: 00142 0	C: 00004 0
23,3620	C: 00006 1	C: 22061 0	C: 34751 0	C: 76245 0	C: 54062 1	C: 50062 0	C: 30765 0	C: 05033 1
23,3630	C: 00006 1	C: 74736 0	C: 50062 0	C: 52736 1	C: 50062 0	C: 20765 0	C: 05032 0	C: 00006 1
23,3640	C: 74736 0	C: 50062 0	C: 52744 1	C: 10062 1	C: 13623 1	C: 30061 0	C: 00003 1	C: 00000 1
23,3650	I: 77776 1	C: 03551 0	C: 13655 0	I: 77776 1	C: 03557 0	C: 07535 0	C: 46250 1	C: 03677 1
23,3660	C: 06042 1	I: 43575 1	C: 00123 1	I: 77776 1	C: 03551 0	C: 12670 1	I: 77776 1	C: 03557 0
23,3670	C: 07535 0	C: 36254 0	C: 13657 1	I: 77776 1	C: 13655 0	I: 77776 1	C: 13670 1	C: 54142 1
23,3700	C: 00006 1	C: 22145 1	C: 10142 1	C: 40142 1	C: 66250 0	C: 00006 1	C: 50000 1	C: 33766 0
23,3710	C: 52144 1	C: 34753 1	C: 54130 1	C: 00006 1	C: 50143 1	C: 40123 0	C: 13720 0	C: 52131 0
23,3720	C: 52155 1	C: 33764 1	C: 60143 1	C: 54116 0	C: 07112 1	C: 10142 1	C: 52155 1	C: 13732 0
23,3730	C: 00006 1	C: 40155 1	C: 52160 1	C: 36245 1	C: 26116 0	C: 00006 1	C: 50130 0	C: 50143 1
23,3740	C: 30123 1	C: 52155 1	C: 07112 1	C: 52155 1	C: 20160 1	C: 52160 1	C: 20001 1	C: 50130 0
23,3750	C: 50143 1	C: 52123 0	C: 52131 0	C: 10000 0	C: 13717 1	C: 00006 1	C: 26142 1	C: 10142 1
23,3760	C: 13702 0	C: 00145 1	C: 13702 0	C: 00145 1	C: 00735 0	C: 00004 0	C: 00002 0	C: 00000 1
23,3770	C: 00004 0	C: 03771 0	C: 02772 0	CKSM 62207 0	a	a	a	a

OPTAL LISTING FOR PARAGRAPH # 14), WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

24,2000	05327 1	C: 0104 0	C: 05022 1	C: 26000 0	02670 1	02007 1	02036 0	05504 0
24,2010	C: 00026 0	34753 1	05514 0	34363 0	04616 1	C: 20624 1	06001 0	02021 0
24,2020	02013 1	44753 0	61144 1	00006 1	12040 0	32311 0	04616 1	C: 20477 1
24,2030	06001 0	02023 0	02025 1	06042 1	I: 77650 1	C: 64217 1	05516 0	C: 00026 0
24,2040	04616 1	C: 11236 0	05504 0	C: 00027 1	05504 0	C: 00031 0	05504 0	C: 00010 0
24,2050	05516 0	C: 01037 0	05516 0	C: 00040 0	05516 0	C: 00063 1	05516 0	C: 00126 1
24,2060	05516 0	C: 01041 1	06011 1	05352 1	C: 04022 0	34755 1	55462 1	06042 1
24,2070	I: 77634 0	C: 21574 1	C: 34041 0	C: 51255 1	I: 77624 1	C: 53550 1	I: 77776 1	50154 1
24,2100	02101 0	02111 1	32305 0	04616 1	C: 21563 1	06025 0	02102 0	02063 0
24,2110	05155 0	05353 1	C: 04022 1	02670 1	02117 1	04616 1	C: 46116 0	05353 1
24,2120	C: 05022 1	C: 10000 0	37717 1	05146 1	30075 0	74747 0	00006 1	12232 1
24,2130	34752 0	00006 1	02033 0	00006 1	12170 1	46007 1	61010 1	00006 1
24,2140	12153 0	07751 0	00006 1	12153 0	32307 1	04616 1	C: 21563 1	06025 0
24,2150	02117 1	02117 1	05155 0	32306 0	04616 1	C: 20624 0	06025 0	02117 1
24,2160	02670 1	02166 1	03136 0	05504 0	C: 00040 0	02117 1	04364 1	02117 1
24,2170	40110 0	74737 1	00006 1	12205 0	34355 0	70076 1	00006 1	12211 0
24,2200	05516 0	C: 00037 1	05516 0	C: 00040 0	02232 0	32304 1	04616 1	C: 01736 1
24,2210	02170 0	06042 1	I: 77634 0	C: 21574 1	C: 34041 0	C: 50312 1	I: 77776 1	05353 1
24,2220	C: 04022 1	30074 1	74745 1	00006 1	15155 1	30075 0	74747 0	00006 1
24,2230	12264 1	02675 1	32304 1	05173 1	C: 02244 1	30075 0	74747 0	00006 1
24,2240	15155 1	05353 1	C: 40072 0	05155 0	30074 1	74745 1	00006 1	15261 0
24,2250	30075 0	74747 0	00006 1	12261 1	37717 1	05105 0	C: 02631 1	C: 50067 0
24,2260	05261 1	05221 0	C: 02734 0	02244 1	32667 1	05173 1	C: 02270 0	05155 0
24,2270	30075 0	74747 0	10000 0	12277 0	05221 0	C: 02734 0	02270 0	37717 1
24,2300	05105 1	C: 02211 1	C: 50067 0	05261 1	C: 00372 1	C: 00526 0	C: 00201 1	C: 00514 1
24,2310	C: 00074 1	C: 01441 1	I: 45020 1	C: 01757 0	C: 27412 1	I: 77624 1	C: 26645 1	I: 43014 0
24,2320	C: 02756 1	C: 00332 0	C: 01476 0	I: 43014 0	C: 04307 1	C: 50327 1	C: 01475 0	I: 77624 1
24,2330	C: 00747 0	C: 50364 0	I: 77614 1	C: 01474 1	I: 77624 1	C: 27135 0	I: 77624 1	C: 11226 1
24,2340	I: 77624 1	C: 27412 0	I: 43145 0	C: 01671 0	C: 01674 0	I: 77624 1	C: 26645 1	C: 34041 0
24,2350	C: 27135 0	I: 77214 0	C: 04347 0	C: 50216 1	C: 01661 1	I: 77742 0	C: 26352 1	C: 01667 1
24,2360	I: 77742 0	C: 02361 0	I: 77650 1	C: 01757 0	I: 45014 0	C: 01674 0	C: 27135 0	I: 77624 1
24,2370	C: 11226 1	I: 77624 1	C: 27412 0	I: 71214 0	C: 01674 1	C: 01643 1	I: 77650 1	C: 50345 0

OCTAL LISTING FOR PARAGRAPH # 141, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

24,2400	05327 1	C: 00004 0	C: 05722 1	C: 26000 0	04616 1	C: 11236 0	05504 0	C: 00031 0
24,2410	05504 0	C: 00006 1	05516 0	C: 00010 0	05353 1	C: 04022 0	34743 0	70074 0
24,2420	00006 1	15155 1	34747 1	00075 1	00006 1	12433 0	34757 0	55745 1
24,2430	04616 1	C: 46123 0	02414 1	32444 1	05173 1	C: 02427 0	05155 0	35024 1
24,2440	05105 0	C: 02414 1	C: 50067 0	05261 1	C: 13560 0	05353 1	C: 04022 0	34745 0
24,2450	70074 0	000 6 1	15155 1	34747 1	70075 1	00006 1	12640 0	34736 1
24,2460	00006 1	02012 0	00006 1	12111 0	34752 0	00006 1	02033 0	00006 1
24,2470	12472 0	02135 1	40110 0	74737 1	00006 1	12631 0	05353 1	C: 00152 1
24,2500	04616 1	C: 64366 0	50154 1	02504 1	02525 1	02217 1	32664 1	04616 1
24,2510	C: 21563 1	06025 0	02515 1	02506 0	05155 0	05353 1	C: 04022 0	32665 0
24,2520	04616 1	C: 20510 1	06025 0	02525 1	02217 1	05353 1	C: 04022 0	02670 1
24,2530	02545 1	30075 0	74747 0	00006 1	12640 0	04616 1	C: 51333 0	50154 1
24,2540	02541 0	02545 1	04616 1	C: 46116 0	02640 1	40075 1	74746 1	00006 1
24,2550	12631 0	00075 0	74745 1	00006 1	12631 0	37717 1	55055 1	06042 1
24,2560	I: 77650 1	C: 54416 0	I: 77776 1	05353 1	C: 04022 0	12624 1	I: 77776 1	34755 1
24,2570	55746 1	05353 1	C: 04022 0	37720 0	05072 1	C: 02645 1	C: 50067 0	06042 1
24,2600	I: 77735 0	C: 03747 0	I: 50054 0	C: 50600 1	C: 50612 1	I: 77650 1	C: 03675 0	44752 1
24,2610	55746 1	05155 0	I: 77776 1	31746 0	64752 0	00006 1	12445 1	06042 1
24,2620	I: 77624 1	C: 11226 1	I: 77650 1	C: 55431 1	25462 0	02670 1	02642 0	34756 1
24,2630	02634 1	02671 1	02642 0	34752 0	55745 1	04616 1	C: 46123 0	02445 0
24,2640	02667 1	02233 1	04616 1	C: 01735 1	02445 0	32666 0	04616 1	C: 20510 1
24,2650	02607 1	44753 0	55746 1	05155 0	05353 1	C: 00152 1	04616 1	C: 53112 0
24,2660	04616 1	C: 17706 1	02217 1	02445 0	C: 00525 0	C: 01405 1	C: 01461 0	C: 02734 0
24,2670	40104 0	74744 0	10000 0	24002 0	00002 0	44736 0	00006 1	03012 1
24,2700	02670 1	02706 1	34755 1	55106 0	55107 1	02716 0	34740 0	70110 0
24,2710	10000 0	02726 0	34735 1	55106 0	44726 0	55107 1	05516 0	C: 00012 1
24,2720	04616 1	C: 52506 0	02723 0	04616 1	C: 17706 0	02761 0	05504 0	C: 00041 1
24,2730	32310 1	55113 1	36250 0	55456 0	06042 1	I: 43234 0	C: 21574 1	C: 11121 0
24,2740	C: 34 41 0	C: 51255 1	I: 77776 1	05504 0	C: 00012 1	05516 0	C: 00126 1	06042 1
24,2750	I: 77624 1	C: 52404 0	I: 77776 1	03002 0	02111 1	04616 1	C: 17706 0	02761 0
24,2760	02770 0	33000 1	04616 1	C: 21563 1	06025 0	02775 0	02211 1	05155 0
24,2770	05516 0	C: 01 41 1	02670 1	02232 0	03122 0	05353 1	C: 04022 0	03207 1

OCTAL LISTING FOR PARAGRAPH # 142, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

24,3000	C: 00503 1	C: 00527 1	32210 1	55423 1	05504 0	C: 00005 1	05516 0	C: 00041 1
24,3010	06142 1	I: 42224 0	C: 21574 1	C: 11117 0	C: 03425 1	C: 34041 0	C: 51255 1	I: 77624 1
24,3020	C: 52474 0	I: 77776 1	03034 0	05155 0	06132 0	C: 52604 1	06042 1	I: 43014 0
24,3030	C: 00345 0	C: 51044 0	C: 00225 1	C: 51041 0	11423 1	03037 0	03106 0	55423 1
24,3040	06042 1	I: 52145 0	C: 03425 1	C: 51013 1	I: 77745 1	C: 03425 1	C: 34041 0	C: 50312 1
24,3050	I: 77776 1	05504 0	C: 00264 1	05516 0	C: 00012 1	05504 0	C: 00126 1	04616 1
24,3060	C: 52516 0	03062 1	06042 1	I: 44234 1	C: 21574 1	C: 03425 1	C: 03427 0	I: 77776 1
24,3070	06076 1	31427 1	05277 0	C: 03076 0	C: 50067 0	05155 0	06022 0	C: 52613 1
24,3100	06111 1	37717 1	05105 0	C: 02726 0	C: 50067 0	05261 1	33115 1	04616 1
24,3110	C: 21563 1	06025 0	06025 0	06025 0	05155 0	C: 00530 1	C: 00000 1	C: 01750 1
24,3120	C: 00000 1	C: 00062 0	05353 1	C: 04022 0	33135 0	04616 1	C: 20711 1	06025 0
24,3130	02232 0	03124 0	34745 0	05464 1	05155 0	C: 01510 1	05504 0	C: 00126 1
24,3140	00004 0	04674 0	C: 40141 1	00003 1	24736 1	00006 1	05012 1	33206 0
24,3150	04616 1	C: 20624 0	03177 0	03155 0	03202 1	00004 0	04523 1	C: 00035 1
24,3160	03167 1	04674 0	C: 40115 0	00003 1	05516 0	C: 00126 1	02163 1	00003 1
24,3170	03205 0	04616 1	C: 21563 1	03177 0	03170 1	03202 1	05155 0	05516 0
24,3200	C: 01126 1	06025 0	04616 1	C: 46116 0	03144 0	C: 00501 0	C: 00205 0	05504 0
24,3210	C: 00037 0	05516 0	C: 00041 1	34755 1	55733 0	55734 1	55735 0	05353 1
24,3220	C: 04022 0	33254 1	04616 1	C: 20505 0	06025 0	03231 1	03235 0	04616 1
24,3230	C: 55442 0	06032 0	C: 55643 0	06011 1	12063 1	05353 1	C: 04022 0	06032 0
24,3240	C: 55643 0	06011 1	34774 1	04616 1	C: 01736 1	02670 1	02251 1	04616 1
24,3250	C: 46116 0	34755 1	55303 1	03217 0	C: 04120 0	I: 43020 1	C: 01757 0	C: 01343 1
24,3260	C: 51264 0	I: 77614 1	C: 04307 1	C: 51274 1	I: 77624 1	C: 27101 1	I: 77775 1	C: 00001 0
24,3270	C: 26352 1	C: 00067 0	C: 16360 0	C: 00015 0	C: 34041 0	C: 27067 0	I: 52375 1	C: 00007 0
24,3300	C: 02360 0	I: 76521 0	C: 01734 1	I: 77776 1	06032 0	C: 52613 1	06042 1	C: 25761 0
24,3310	C: 00001 0	I: 43051 1	C: 02352 1	C: 00350 1	C: 51321 0	I: 77604 0	C: 57753 1	I: 77661 0
24,3320	C: 20212 1	I: 41056 1	C: 50102 1	I: 76521 0	C: 01734 0	C: 15101 0	C: 00045 0	C: 01767 0
24,3330	I: 77614 1	C: 00231 1	C: 01757 0	04645 1	55737 1	06042 1	I: 65545 0	C: 03745 1
24,3340	I: 50025 0	C: 11355 1	C: 51347 0	I: 77776 1	34753 1	54154 0	13352 1	I: 77776 1
24,3350	34755 1	54154 0	21737 0	04640 1	C: 02525 1	C: 12525 0	35031 0	05072 1
24,3360	C: 02550 0	C: 64063 0	34774 1	05224 0	40110 0	74742 0	10000 0	15261 0
24,3370	40076 1	74740 1	00006 1	13376 1	26076 1	13356 0	34753 1	13363 0

OCTAL LISTING FOR PARAGRAPH # 143, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "@" CENTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

24,3400	37717 1	05072 1	C: 03413 1	C: 50067 0	35000 1	05224 0	30077 1	74743 I
24,3410	10000 0	13400 1	15261 0	30077 1	74741 0	10000 0	13507 0	30110 1
24,3420	74752 1	17000 0	13475 0	04616 1	C: 53112 0	04616 1	C: 17706 0	13475 0
24,3430	53105 0	52155 1	06004 0	00006 1	30036 1	52157 0	00006 1	36034 0
24,3440	52161 0	31032 0	54162 0	04616 1	C: 53114 0	04616 1	C: 17706 0	13466 1
24,3450	00004 0	53331 0	53757 1	52155 1	53755 0	52157 0	53753 0	52161 0
24,3460	53460 0	31162 1	55461 1	34753 1	55462 1	15155 1	40101 0	74742 0
24,3470	10000 0	13475 0	05516 0	C: 00120 1	13443 0	44726 0	00006 1	03012 1
24,3500	34755 1	55462 1	05516 0	C: 00063 1	15155 1	34753 1	55144 0	34752 0
24,3510	04616 1	C: 21634 1	06001 0	03515 0	03507 0	34755 1	55044 1	55045 1
24,3520	33674 1	04616 1	C: 20477 1	06001 0	03526 0	03520 0	06042 1	I: 53145 1
24,3530	C: 01145 1	C: 51666 0	C: 24041 0	C: 27412 0	I: 43014 0	C: 00304 0	C: 51554 1	C: 01674 0
24,3540	I: 70535 0	C: 01145 0	I: 43030 0	C: 51545 1	C: 01474 1	I: 42014 0	C: 01676 1	C: 01673 1
24,3550	I: 77624 1	C: 27135 0	I: 77650 1	C: 51575 1	I: 77775 1	C: 03676 0	C: 25535 0	C: 03704 1
24,3560	C: 15543 1	C: 03763 0	C: 01517 0	I: 43014 0	C: 01676 1	C: 00263 0	I: 53135 0	C: 01163 1
24,3570	C: 51573 1	I: 77614 1	C: 00063 1	I: 77624 1	C: 27110 1	I: 77745 1	C: 00015 0	C: 27763 0
24,3600	C: 00017 1	C: 27676 0	C: 00025 0	C: 03714 1	I: 53646 0	C: 57576 1	C: 27712 0	C: 00001 0
24,3610	I: 50256 0	C: 00007 0	I: 67471 1	C: 03712 0	C: 03714 0	I: 67334 1	C: 01162 0	C: 01145 0
24,3620	I: 46142 1	C: 51624 0	I: 77650 1	C: 51627 0	I: 77614 1	C: 04307 1	C: 51621 1	I: 77614 1
24,3630	C: 00064 0	I: 67214 1	C: 01663 0	C: 00050 1	I: 43054 1	C: 51627 1	C: 01463 1	I: 77775 1
24,3640	C: 00001 0	C: 16032 1	C: 00015 0	I: 45014 0	C: 00662 0	C: 26351 1	I: 77605 1	C: 11676 0
24,3650	C: 03716 1	I: 77776 1	33673 0	04616 1	C: 20477 1	06001 0	06001 0	06042 1
24,3660	I: 43345 1	C: 03763 0	C: 11672 1	C: 01045 1	I: 77634 0	C: 51520 1	I: 52034 1	C: 21574 1
24,3670	C: 51532 1	C: 00003 1	C: 25140 0	C: 01453 1	C: 01442 1	C: 00243 1	C: 32703 1	I: 46020 1
24,3700	C: 00050 1	C: 51721 1	I: 77624 1	C: 51727 1	I: 61375 1	C: 02013 1	C: 00025 0	I: 77772 0
24,3710	I: 51235 1	C: 00001 0	C: 00001 0	I: 77721 0	C: 00025 0	I: 40372 0	C: 00001 0	I: 77650 1
24,3720	C: 00050 1	I: 77624 1	C: 55743 1	I: 77624 1	C: 15761 0	I: 77650 1	C: 51710 0	I: 40220 0
24,3730	C: 00051 0	C: 00011 1	I: 77770 1	C: 00005 1	I: 65345 0	C: 14017 1	C: 14011 1	I: 45006 0
24,3740	C: 53712 0	I: 71406 0	C: 14041 1	I: 77756 0	C: 14042 0	C: 14015 0	I: 41525 0	C: 14007 0
24,3750	I: 45170 0	C: 00004 0	C: 53712 0	C: 14027 1	C: 14013 0	I: 41525 0	C: 14005 1	I: 45170 0
24,3760	C: 00005 1	C: 53712 0	I: 71406 0	I: 77606 1	C: 00025 0	I: 76405 1	C: 00041 1	C: 14035 1
24,3770	I: 76405 1	C: 00043 0	C: 14037 0	I: 41556 1	I: 52076 1	C: 53633 1	C: 03776 1	CKSM 76245 0

OCTAL LISTING FOR PARAGRAPH # 144, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

25,2000	C: 47777 0	C: 00001 0	C: 01150 1	11777 0	12006 1	15261 0	05203 0	C: 02003 0
25,2010	C: 52064 1	37716 1	05072 1	C: 02022 1	C: 52064 1	34736 1	00006 1	71776 1
25,2020	61775 0	55773 1	15261 0	02060 0	04616 1	C: 17706 0	25575 1	00004 0
25,2030	30101 1	74741 0	10000 0	12050 1	53101 1	51776 0	53601 0	30110 1
25,2040	00006 1	06033 1	74746 1	00006 1	12050 1	05567 0	C: 00522 1	25575 1
25,2050	41776 1	61774 1	00006 1	12056 1	31776 0	64752 0	55776 1	15155 1
25,2060	34753 1	54133 1	51773 0	32065 0	14622 1	C: 53114 0	C: 53112 0	C: 53110 1
25,2070	C: 52106 0	C: 53104 1	C: 53102 1	02102 0	05221 0	C: 00144 0	44753 0	70110 0
25,2100	54110 0	15261 0	00006 1	23312 0	34753 1	00006 1	05012 1	05221 0
25,2110	C: 00002 0	34755 1	54025 0	54036 0	44753 0	00006 1	03012 1	05221 0
25,2120	C: 01750 1	44737 1	70110 0	54110 0	30035 1	04512 0	C: 57777 1	12132 1
25,2130	34755 1	12133 0	34740 0	56110 1	77744 0	26110 0	04564 1	01212 0
25,2140	02167 0	05221 0	C: 00002 0	34740 0	70110 0	10000 0	34735 1	02252 0
25,2150	34740 0	70110 0	10000 0	44736 0	02255 1	44741 0	70110 0	54110 0
25,2160	74742 0	10000 0	12604 0	44752 1	00006 1	03012 1	15261 0	34752 0
25,2170	00006 1	02012 0	10000 0	00002 0	54112 1	54113 0	34752 0	00006 1
25,2200	05012 1	00002 0	34743 0	70110 0	10000 0	34735 1	02252 0	37743 0
25,2210	02255 1	40110 0	74740 1	10000 0	32242 0	62242 1	02252 0	40110 0
25,2220	74740 1	10000 0	34735 1	02252 0	40110 0	74740 1	10000 0	44736 0
25,2230	02255 1	02244 1	44736 0	70110 0	54110 0	34742 1	70110 0	00006 1
25,2240	13540 1	02613 1	C: 67070 1	C: 61615 1	22110 1	34740 0	00006 1	06001 0
25,2250	54110 0	00002 0	55313 0	34755 1	12257 1	55313 0	34753 1	55314 1
25,2260	00006 1	23312 0	12265 0	05221 0	C: 00062 0	40110 0	77713 1	00006 1
25,2270	12155 0	31313 1	00006 1	51314 0	20035 0	54061 1	00006 1	72316 0
25,2300	54001 1	30110 1	74752 1	56061 0	04512 0	C: 77644 1	10061 1	01212 0
25,2310	11314 1	12313 0	56001 0	53355 1	02317 0	12263 0	C: 22715 1	22002 0
25,2320	34753 1	54062 1	50000 1	31354 1	54061 1	04512 0	C: 77177 0	12346 0
25,2330	30061 0	50562 0	56112 0	40000 0	60061 0	64754 0	50062 0	54053 0
25,2340	10062 1	12321 1	35020 0	00006 1	05014 1	00001 0	10061 1	42226 0
25,2350	12352 0	22326 1	54061 1	12331 0	32403 1	70110 0	10000 0	13512 1
25,2360	00004 0	44737 1	70110 0	64737 0	54110 0	34753 1	05203 0	C: 02401 0
25,2370	C: 52067 1	40110 0	74752 1	10000 0	12377 1	05567 0	C: 00510 0	00003 1

OCTAL LISTING FOR PARAGRAPH # 145, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

25,2400	14631 C	02102 C	13531 1	C: 02001 1	I: 43120 1	C: 01112 1	C: 00271 C	I: 77624 1
25,2410	C: 47541 1	I: 45175 C	C: 01101 C	C: 47673 C	I: 77624 1	C: 26133 1	I: 77776 1	00004 C
25,2420	04523 1	C: 01106 1	02425 C	25112 1	02443 C	40104 C	74744 C	00006 1
25,2430	12467 1	02472 1	40104 C	74744 C	00006 1	12467 1	30074 1	74745 1
25,2440	10000 C	02502 1	15155 1	25112 1	40110 C	74742 C	26110 C	74741 C
25,2450	10000 C	12457 1	02167 C	34752 C	05203 C	C: 02604 1	C: 52067 1	21303 C
25,2460	00006 1	12463 C	05155 C	00003 1	25112 1	31112 1	14640 C	34755 1
25,2470	55303 1	12463 C	02244 1	04523 1	C: 01110 C	12502 C	02244 1	34736 1
25,2500	26110 C	12423 1	02244 1	25112 1	12467 1	C: 01074 1	04645 1	55112 C
25,2510	05516 C	C: 00041 1	32505 C	55112 1	00004 C	02551 1	C: 01106 1	12534 C
25,2520	00003 1	01006 1	31107 C	53753 C	06042 1	I: 77624 1	C: 46041 C	C: 01101 C
25,2530	I: 77414 C	C: 00071 1	00004 C	12444 C	02244 1	02551 1	C: 01106 1	12544 1
25,2540	02244 1	34736 1	26110 C	12520 C	02244 1	05567 C	C: 00502 C	06011 1
25,2550	05155 C	50002 C	30000 1	24002 C	00006 1	50000 C	30001 C	52062 1
25,2560	22002 C	34745 C	70110 C	10000 C	14550 1	20061 C	04512 C	C: 66161 1
25,2570	00001 C	30062 C	00006 1	62601 1	64562 1	04512 C	C: 64420 C	00001 C
25,2600	04560 C	62602 C	12575 C	C: 03512 1	40110 C	74736 C	10000 C	02613 1
25,2610	02202 C	05221 C	C: 00062 C	34741 1	70110 C	10000 C	12634 C	10110 C
25,2620	12623 C	12623 C	12640 C	40110 C	74742 C	10000 C	13521 1	11113 1
25,2630	12637 C	42645 C	00006 1	03012 1	05516 C	C: 00271 C	13545 1	55113 1
25,2640	37717 1	05115 C	C: 02646 1	C: 52067 1	12611 1	C: 20002 1	00006 1	30036 1
25,2650	53107 1	04042 1	I: 77201 1	C: 00001 C	C: 01101 C	I: 74214 C	C: 00311 1	C: 52671 C
25,2660	C: 01767 C	I: 63372 1	C: 01761 C	I: 53361 C	C: 13101 C	I: 45056 C	C: 47541 1	I: 77624 1
25,2670	C: 47673 C	C: 14041 1	C: 01110 C	I: 41434 1	C: 21577 1	I: 65256 1	I: 41546 C	I: 65205 C
25,2700	C: 00041 1	C: 00045 C	I: 44205 C	C: 00001 C	I: 77626 C	C: 76667 1	I: 47135 C	C: 01107 C
25,2710	C: 21577 1	I: 71416 C	I: 73525 1	I: 41206 C	C: 00003 1	I: 65352 C	C: 00005 C	I: 41325 C
25,2720	C: 00007 C	C: 00001 C	I: 55552 C	I: 77441 C	C: 00041 1	40154 C	00006 1	73075 1
25,2730	55354 C	40110 C	74740 1	00006 1	12737 1	31107 C	12740 1	41107 1
25,2740	00006 1	73075 1	55355 1	06042 1	I: 41345 C	C: 00003 1	C: 00005 1	I: 65252 C
25,2750	I: 65276 1	C: 00001 C	I: 72405 C	C: 00005 1	I: 43066 C	C: 00311 1	C: 52761 C	I: 77624 1
25,2760	C: 47675 1	I: 77441 C	C: 01101 C	00006 1	43077 C	20155 1	10154 C	34755 1
25,2770	12772 C	34753 1	54155 1	10110 C	12777 C	12777 C	13027 C	10155 1

OCTAL LISTING FOR PARAGRAPH # 146, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

25,3000	13010 1	40074 0	74747 0	10000 0	13015 1	34736 1	00006 1	05012 1
25,3010	34751 1	00006 1	02033 0	13000 0	13027 0	44742 0	70110 0	00004 0
25,3020	54110 0	05518 0	C: 00041 1	44752 1	00006 1	03012 1	15155 1	30076 0
25,3030	77715 1	00006 1	13051 1	06042 1	I: 74375 0	C: 01101 0	C: 01767 0	I: 41572 1
25,3040	I: 74375 0	C: 01761 0	C: 13101 0	I: 53262 0	I: 77656 1	C: 15101 0	C: 00045 0	C: 01767 0
25,3050	I: 77776 1	00004 0	40119 0	74741 0	10000 0	02317 0	30076 0	74740 1
25,3060	00006 1	15155 1	11456 0	03073 0	06032 0	C: 52613 1	00003 1	10067 1
25,3070	05122 0	04016 1	C: 51732 1	55456 0	C: 05155 0	C: 21122 0	C: 07777 1	C: 33005 1
25,3100	C: 00310 0	C: 00001 1	03122 0	C: 00017 1	03123 1	C: 00016 0	03123 1	C: 00015 0
25,3110	03123 1	C: 00014 1	03122 0	C: 00012 1	03122 0	C: 00011 1	55104 1	34756 1
25,3120	51104 0	13104 0	34753 1	07004 0	55104 1	00006 1	74751 1	52105 0
25,3130	10000 0	55110 1	64753 1	55077 1	33156 0	00006 1	02033 0	55112 0
25,3140	43103 1	00006 1	02013 0	50002 0	30000 1	04674 0	C: 36000 1	00006 1
25,3150	00025 0	21105 0	34755 1	54001 1	53101 1	12377 1	C: 00230 0	00006 1
25,3160	34007 1	54016 1	00006 1	22012 1	00006 1	31454 0	53272 0	34757 0
25,3170	00006 1	02013 1	55332 0	00006 1	13200 1	30046 0	51322 1	55327 1
25,3200	11077 1	13223 0	13236 1	05567 0	C: 00520 0	05270 1	30107 1	74735 0
25,3210	00016 1	13223 0	40077 0	74743 1	00006 1	13220 0	05567 0	C: 00521 1
25,3220	44753 0	55077 1	03543 0	55077 1	34751 0	00006 1	02013 1	00006 1
25,3230	13277 1	03365 1	36250 0	00006 1	06013 0	76250 1	00006 1	13273 0
25,3240	34733 1	70046 1	62000 0	54001 1	30046 0	60000 1	74753 0	52064 1
25,3250	34744 1	03425 1	11110 1	03263 0	44753 0	55077 1	40061 1	70110 0
25,3260	54110 0	03572 1	03536 1	55110 1	11077 1	13267 0	13444 1	34750 1
25,3270	04674 0	C: 36000 1	05270 1	34747 1	54061 1	34743 0	03321 1	34741 1
25,3300	70110 0	10000 0	13220 0	40110 0	74745 1	10000 0	13220 0	34750 1
25,3310	54061 1	34753 1	00006 1	02013 1	54002 1	10000 0	13320 1	13332 1
25,3320	34751 0	00006 1	00006 1	02033 0	56001 0	70110 0	00006 1	06001 0
25,3330	10000 0	03351 0	34733 1	70046 1	54064 1	30046 0	60000 1	74753 0
25,3340	54063 0	10002 1	13403 1	00006 1	42002 0	20064 1	30061 0	03426 1
25,3350	03254 1	22110 1	64753 1	00006 1	06001 0	54110 0	33156 0	00006 1
25,3360	02033 0	55112 0	05504 0	C: 00120 1	13220 0	40101 0	74741 0	10000 0
25,3370	00002 0	43402 0	70110 0	54001 1	33402 1	00006 1	02033 0	60001 0

OCTAL LISTING FOR PARAGRAPH # 150, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

26,2000	C: 17775 1	C: 02152 1	C: 00333 1	C: 10374 0	C: 77665 1	C: 42175 1	C: 22211 0	C: 00636 1
26,2010	C: 77777 0	C: 77767 1	C: 37436 1	C: 01614 0	C: 32417 1	C: 32011 0	C: 02052 1	C: 35552 0
26,2020	C: 37116 0	C: 32631 1	C: 04616 1	C: 11236 0	C: 36250 0	C: 55050 1	C: 34753 1	C: 55051 0
26,2030	C: 32117 1	C: 04616 1	C: 20477 1	C: 05472 0	C: 02036 0	C: 02030 0	C: 06042 1	C: 1: 42234 0
26,2040	C: 21574 1	C: 14122 0	C: 02205 1	C: 34041 0	C: 27067 0	I: 77775 1	C: 00001 0	C: 16207 0
26,2050	C: 02205 1	C: 34041 0	C: 27101 1	I: 52375 1	C: 02207 0	C: 00001 0	I: 47121 0	C: 01734 0
26,2060	C: 21727 0	C: 03773 1	I: 77776 1	C: 41051 0	C: 64752 1	C: 00006 1	C: 12113 1	C: 06042 1
26,2070	I: 77775 1	C: 06522 1	C: 37765 1	C: 56040 0	C: 00322 1	I: 77776 1	C: 04616 1	C: 54272 1
26,2100	C: 32120 0	C: 04616 1	C: 20477 1	C: 05472 0	C: 02106 1	C: 02036 0	C: 05516 0	C: 00124 0
26,2110	C: 04616 1	C: 54123 0	C: 15472 1	C: 06042 1	I: 52175 0	C: 06516 0	C: 54072 0	C: 01014 0
26,2120	C: 01422 1	C: 00000 1	C: 13560 0	C: 04645 1	C: 55162 0	C: 05504 0	C: 00013 0	C: 05516 0
26,2130	C: 00000 1	C: 34746 0	C: 70101 0	C: 10000 0	C: 12142 0	C: 06042 1	I: 77624 1	C: 56040 0
26,2140	C: 00322 1	I: 77776 1	C: 04616 1	C: 54272 1	C: 32260 1	C: 04616 1	C: 20711 1	C: 02246 0
26,2150	C: 02154 0	C: 02201 0	C: 02205 1	C: 05155 0	C: 34746 0	C: 70101 0	C: 10000 0	C: 12165 0
26,2160	C: 06042 1	I: 77624 1	C: 56040 0	C: 00322 1	I: 77776 1	C: 04616 1	C: 54272 1	C: 02261 0
26,2170	C: 10000 0	C: 12144 0	C: 32260 1	C: 04616 1	C: 20452 0	C: 02205 1	C: 04616 1	C: 17742 0
26,2200	C: 12144 0	C: 05516 0	C: 00124 0	C: 31163 1	C: 04640 1	C: 40100 1	C: 74740 1	C: 10000 0
26,2210	C: 00002 0	C: 30002 0	C: 54156 1	C: 46250 1	C: 60133 0	C: 55054 0	C: 05353 1	C: 00132 1
26,2220	C: 34745 0	C: 05464 1	C: 00156 0	C: 37717 1	C: 05146 1	C: 34747 1	C: 70075 1	C: 10000 0
26,2230	C: 12243 1	C: 34745 0	C: 70074 0	C: 10000 0	C: 02240 0	C: 05353 1	C: 40112 1	C: 05155 0
26,2240	C: 05353 1	C: 40112 0	C: 05155 0	C: 05504 0	C: 00077 1	C: 01054 1	C: 31010 1	C: 00006 1
26,2250	C: 12201 1	C: 31100 0	C: 74740 1	C: 00006 1	C: 16001 1	C: 06025 0	C: 20100 1	C: 00203 0
26,2260	C: 01422 1	C: 00006 1	C: 00320 1	C: 74742 0	C: 10000 0	C: 00002 0	C: 00006 1	C: 00031 0
26,2270	C: 74736 0	C: 00002 0	C: 04645 1	C: 55327 0	C: 30321 1	C: 54771 1	C: 30322 1	C: 54765 1
26,2300	C: 30323 0	C: 54767 0	C: 06042 1	I: 45001 1	C: 00001 0	C: 47545 0	I: 41345 0	C: 00742 0
26,2310	C: 00746 1	I: 57552 1	I: 65336 1	C: 00740 1	C: 14023 0	C: 00746 1	I: 72405 0	C: 00750 0
26,2320	C: 34021 0	C: 26510 1	I: 41325 0	C: 00740 1	C: 00742 0	I: 41512 1	I: 65205 0	C: 00744 0
26,2330	I: 65205 0	C: 00736 0	C: 00750 0	I: 72405 0	C: 00744 0	I: 45425 0	C: 63756 0	C: 00736 0
26,2340	I: 72405 0	C: 00750 0	I: 45415 0	C: 42754 0	C: 26510 1	I: 55525 0	I: 77634 0	C: 21621 1
26,2350	C: 02245 1	I: 77776 1	C: 31337 1	C: 04640 1	I: 47375 0	C: 02255 0	C: 06522 1	I: 47256 0
26,2360	C: 03765 0	I: 40056 0	C: 54276 1	C: 17271 0	C: 00045 0	I: 50025 0	C: 14415 1	C: 54276 1
26,2370	I: 77775 1	C: 03271 0	C: 17271 0	C: 06522 1	I: 77650 1	C: 56072 1	I: 52175 0	C: 06522 1

OCTAL LISTING FOR PARAGRAPH # 151, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

26,2400	C: 54372 0	C: 15555 0	C: 35172 0	C: 14113 1	C: 36326 0	C: 07701 0	C: 35703 0	C: 04343 1
26,2410	C: 21616 0	C: 03170 0	C: 34344 0	C: 00000 1	C: 00001 0	C: 00000 1	I: 77624 1	C: 11226 1
26,2420	I: 43014 0	C: 437 1	C: 55200 0	C: 02466 1	I: 45014 0	C: 00747 0	C: 54460 1	C: 27412 0
26,2430	I: 45014 0	C: 01674 0	C: 26645 1	I: 77624 1	C: 55242 0	I: 77624 1	C: 11226 1	I: 77624 1
26,2440	C: 27412 0	I: 43014 0	C: 01676 1	C: 02756 1	C: 54450 1	I: 43014 0	C: 01476 0	C: 01475 0
26,2450	I: 43014 0	C: 01474 1	C: 01673 1	I: 45014 0	C: 01472 1	C: 55242 0	I: 77650 1	C: 54510 1
26,2460	I: 77624 1	C: 27412 0	I: 45014 0	C: 01474 1	C: 26645 1	I: 77624 1	C: 55242 0	I: 77624 1
26,2470	C: 11226 1	I: 77624 1	C: 27412 0	I: 43014 0	C: 01676 1	C: 02756 1	C: 54502 1	I: 43014 0
26,2500	C: 01476 0	C: 01475 0	I: 43014 0	C: 01673 1	C: 01674 0	I: 45014 0	C: 01472 1	C: 55242 0
26,2510	I: 45014 0	C: 02716 0	C: 54510 1	C: 55251 1	I: 77414 0	C: 04307 1	C: 54524 0	34755 1
26,2520	55745 1	C: 04616 1	C: 46123 0	C: 06042 1	I: 43174 1	C: 00000 1	C: 04304 1	C: 54532 1
26,2530	I: 77714 0	C: 00002 0	I: 45134 0	C: 03720 1	C: 11226 1	I: 66170 1	C: 00001 0	C: 01356 0
26,2540	I: 54335 0	C: 01775 0	C: 21635 0	I: 77634 0	C: 21634 0	C: 00025 0	I: 77624 1	C: 55333 1
26,2550	I: 57414 1	C: 00707 1	C: 54553 0	C: 27525 0	C: 06524 1	C: 03533 1	C: 17541 1	C: 00045 0
26,2560	I: 44257 1	C: 56174 0	C: 03757 1	I: 77657 0	C: 56574 1	C: 17547 1	C: 00045 0	I: 63501 0
26,2570	C: 00747 1	I: 53605 1	C: 01771 1	C: 20577 0	I: 53657 0	C: 20601 1	C: 57176 0	I: 47057 0
26,2600	C: 57176 0	C: 21634 0	C: 02707 0	I: 76276 0	C: 00025 0	I: 72240 1	C: 54611 0	C: 00025 0
26,2610	C: 02707 0	I: 77624 1	C: 55401 1	I: 45131 0	C: 01357 1	C: 00002 0	C: 11226 1	I: 77624 1
26,2620	C: 55333 1	I: 53725 1	C: 00045 0	C: 57202 0	C: 24045 0	I: 57414 1	C: 00707 1	C: 54630 0
26,2630	I: 77761 1	C: 00045 0	C: 27533 1	C: 01653 0	I: 53257 1	C: 57170 0	C: 01667 1	I: 53715 1
26,2640	C: 01601 1	C: 57176 0	I: 52255 1	C: 01615 1	I: 50315 0	C: 00001 0	C: 00007 0	I: 53606 1
26,2650	C: 56174 0	I: 57316 1	C: 01773 0	C: 02707 0	I: 54335 0	C: 01776 0	C: 20621 0	C: 00031 0
26,2660	I: 50025 0	C: 02707 0	C: 54666 0	I: 77745 1	C: 00031 0	C: 02707 0	I: 60545 0	I: 53725 1
26,2670	C: 03751 1	C: 56577 1	I: 77625 0	I: 77675 0	C: 00045 0	C: 27547 1	C: 00001 0	I: 47235 0
26,2700	I: 57414 1	C: 00707 1	C: 54703 1	I: 77657 0	C: 57200 1	C: 27525 0	C: 06524 1	C: 00025 0
26,2710	C: 27541 1	C: 3525 0	I: 60246 1	C: 00025 0	I: 51575 1	C: 03533 1	I: 71301 0	C: 00027 1
26,2720	C: 00027 1	I: 51025 0	C: 00025 0	C: 54727 1	I: 52150 1	C: 00026 0	C: 54731 0	I: 77750 0
26,2730	C: 00024 1	I: 53775 1	C: 03525 0	C: 20201 0	C: 27525 0	C: 03533 1	I: 77657 0	C: 20201 0
26,2740	C: 17533 1	C: 03547 1	I: 77657 0	C: 20201 0	C: 03547 1	I: 53745 1	C: 00045 0	C: 20200 1
26,2750	I: 41316 0	C: 02777 0	I: 47012 1	C: 21624 0	C: 36707 1	C: 55401 1	I: 77624 1	C: 11226 1
26,2760	I: 77414 0	C: 04207 1	C: 55176 1	33332 0	54006 0	31457 0	54765 1	21460 1
26,2770	54767 0	31461 0	54771 1	06042 1	I: 45175 0	C: 06522 1	C: 47666 1	I: 76505 0

OCTAL LISTING FOR PARAGRAPH # 152, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

26,3000	C: 01734 0	C: 27677 1	C: 06520 0	I: 77624 1	C: 47675 0	I: 76505 0	C: 01734 0	C: 27705 0
26,3010	C: 06516 0	I: 77624 1	C: 47675 0	I: 76505 0	C: 01734 0	C: 27713 0	C: 55361 0	I: 77331 0
26,3020	C: 01357 1	C: 00003 1	C: 03724 0	I: 72441 0	C: 02677 1	C: 24023 0	C: 03724 0	I: 72441 0
26,3030	C: 02713 1	C: 34 21 0	C: 26510 1	I: 41221 0	C: 03726 0	C: 15441 1	I: 41472 0	I: 52545 1
26,3040	C: 01701 0	I: 44257 1	C: 56176 1	I: 53605 1	C: 03722 0	C: 21601 0	C: 27547 1	C: 03724 0
26,3050	I: 76435 1	C: 03705 0	I: 77656 1	I: 57414 1	C: 00747 0	C: 55056 1	C: 27525 0	C: 06524 1
26,3060	C: 03533 1	C: 17541 1	C: 03722 0	I: 53657 0	C: 20577 0	C: 56176 1	C: 03541 1	I: 77735 0
26,3070	C: 02011 0	I: 41215 1	C: 15436 1	C: 03722 0	I: 41257 1	C: 21601 0	C: 03722 0	I: 53657 0
26,3100	C: 20577 0	C: 57176 0	I: 47057 0	C: 57176 0	C: 21634 0	C: 16707 1	C: 55401 1	I: 77624 1
26,3110	C: 11226 1	I: 77624 1	C: 55361 0	I: 77331 0	C: 01357 1	C: 00004 0	C: 03724 0	I: 76435 1
26,3120	C: 03705 0	I: 76435 1	C: 03724 0	I: 57414 1	C: 00747 0	C: 55126 1	C: 27525 0	C: 06524 1
26,3130	C: 03533 1	C: 17541 1	C: 03722 0	I: 53657 0	C: 20577 0	C: 56176 1	C: 03543 0	I: 77735 0
26,3140	C: 02012 0	I: 41215 1	C: 15436 1	C: 03722 0	I: 41257 1	C: 21601 0	C: 03722 0	I: 53657 0
26,3150	C: 20577 0	C: 57176 0	I: 47057 0	C: 57176 0	C: 21634 0	C: 16707 0	C: 03732 1	I: 44336 1
26,3160	C: 03734 1	I: 56435 0	C: 15441 1	I: 52525 1	C: 01702 1	I: 44257 1	C: 56176 1	I: 52605 1
26,3170	C: 03722 0	C: 21601 0	C: 37547 0	C: 55401 1	I: 77624 1	C: 11226 1	I: 77650 1	C: 50562 0
26,3200	I: 77624 1	C: 27412 0	I: 43014 0	C: 01472 1	C: 01674 0	I: 77624 1	C: 55242 0	I: 77624 1
26,3210	C: 11226 1	I: 45014 0	C: 02666 0	C: 27412 0	I: 46145 0	C: 03463 0	C: 55231 1	I: 43014 0
26,3220	C: 01675 1	C: 01476 0	I: 43014 0	C: 01474 1	C: 01672 1	I: 77624 1	C: 55242 0	I: 77650 1
26,3230	C: 54514 0	I: 77624 1	C: 55251 1	I: 45014 0	C: 01474 1	C: 26645 1	I: 77624 1	C: 55242 0
26,3240	I: 77650 1	C: 54514 0	I: 71220 1	C: 03675 0	C: 03755 0	C: 34041 0	C: 27135 0	I: 77650 1
26,3250	C: 03675 0	I: 77776 1	33331 0	54006 0	33437 1	55256 0	34755 1	51256 1
26,3260	55400 0	11257 0	03255 0	33332 0	54006 0	06042 1	I: 67214 1	C: 04307 1
26,3270	C: 55274 0	C: 02001 1	I: 77650 1	C: 55276 1	I: 77735 0	C: 02007 1	I: 77661 0	C: 20606 0
26,3300	C: 02401 0	C: 02411 1	C: 02421 1	I: 67214 1	C: 04307 1	C: 55311 1	C: 02002 1	I: 77650 1
26,3310	C: 55313 0	I: 77735 0	C: 02010 1	C: 02511 0	C: 02521 0	C: 02531 1	I: 77735 0	C: 02003 0
26,3320	C: 02621 0	I: 77735 0	C: 02014 1	C: 02631 1	I: 66214 0	C: 02476 0	C: 03463 0	C: 00000 1
26,3330	I: 77616 0	C: 54065 0	C: 54067 1	I: 77201 1	C: 00001 0	C: 01645 1	I: 77754 1	C: 03720 1
26,3340	I: 53257 1	C: 57165 1	C: 01661 1	I: 53715 1	C: 01573 1	C: 57165 1	I: 52255 1	C: 01607 1
26,3350	I: 41434 1	C: 21725 1	C: 17724 0	C: 00045 0	I: 77657 0	C: 20201 0	C: 24045 0	C: 03724 0
26,3360	I: 77616 0	I: 45020 1	C: 03675 0	C: 55333 1	I: 50276 1	C: 03705 0	I: 41572 1	C: 03732 1
26,3370	I: 44316 0	C: 06514 1	I: 41366 1	C: 00045 0	I: 60352 0	C: 00047 1	C: 03722 0	I: 77650 1

OCTAL LISTING FOR PARAGRAPH # 153, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "Q" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

26,3400	C: 03675 0	I: 45020 1	C: 03675 0	C: 46533 0	I: 51575 1	C: 02673 1	I: 53754 1	C: 03720 1
26,3410	C: 56174 0	C: 24317 1	C: 02665 0	I: 53646 0	C: 56174 0	C: 00315 0	I: 54335 0	C: 02005 0
26,3420	C: 24613 1	I: 53025 0	C: 07215 0	C: 50566 1	I: 45335 0	C: 02006 0	C: 00317 1	I: 77640 0
26,3430	C: 50566 1	I: 77624 1	C: 46745 0	I: 77650 1	C: 03675 0	C: 00103 0	C: 03370 0	C: 00241 0
26,3440	C: 21102 1	C: 36652 0	34755 1	55736 0	34736 1	00006 1	05012 1	34736 1
26,3450	70076 1	00006 1	15155 1	23713 1	00004 0	05203 0	C: 03643 0	C: 54067 1
26,3460	05003 1	40110 0	74736 0	00006 1	15155 1	06042 1	I: 43234 0	C: 21574 1
26,3470	C: 15715 0	C: 34041 0	C: 27101 1	I: 77775 1	C: 00001 0	C: 27676 0	C: 00007 0	C: 17740 1
26,3500	C: 00015 0	C: 34041 0	C: 27067 0	I: 52375 1	C: 00001 0	C: 03676 0	I: 77656 1	C: 27712 0
26,3510	C: 00007 0	I: 47256 0	C: 00001 0	I: 77656 1	C: 03704 1	I: 52375 1	C: 00007 0	C: 03740 1
26,3520	I: 76521 0	C: 01734 0	C: 03740 1	I: 53125 0	C: 03727 1	C: 55636 1	I: 53025 0	C: 15711 1
26,3530	C: 55623 0	I: 77775 1	C: 03720 1	C: 24015 0	C: 03726 1	C: 00023 0	I: 77761 1	C: 15705 1
26,3540	C: 27720 1	C: 00015 0	I: 53361 0	C: 06522 1	C: 03720 1	I: 77656 1	C: 27720 1	C: 00015 0
26,3550	I: 77761 1	C: 15705 1	C: 27726 1	C: 00023 0	I: 52361 1	C: 06522 1	C: 03726 1	I: 77656 1
26,3560	C: 03726 1	I: 53361 0	C: 15707 0	C: 03712 0	I: 64256 1	C: 01734 0	I: 77772 0	C: 25101 0
26,3570	C: 03740 1	C: 01761 0	I: 77776 1	00004 0	06032 0	C: 52613 1	44735 0	70110 0
26,3600	64735 1	54110 0	06042 1	I: 77624 1	C: 52404 0	I: 77776 1	03675 0	03675 0
26,3610	00006 1	00006 1	53753 0	06042 1	I: 77624 1	C: 46041 0	I: 65545 0	C: 00045 0
26,3620	C: 03735 0	I: 77776 1	05155 0	I: 47375 0	C: 03704 1	C: 03712 0	I: 77656 1	C: 27720 1
26,3630	C: 03712 0	I: 53435 0	C: 03720 1	C: 03726 1	I: 77650 1	C: 55561 0	I: 64375 1	C: 03712 0
26,3640	C: 01734 0	I: 52172 1	C: 55567 0	00074 1	74745 1	00006 1	15261 0	37716 0
26,3650	05105 0	C: 03654 0	C: 54067 1	05261 1	34750 1	00006 1	02023 0	00006 1
26,3660	13667 1	46245 0	61736 1	00006 1	13442 1	25726 1	13444 1	33703 0
26,3670	55733 0	00004 0	06032 0	C: 52613 1	05155 0	05567 0	C: 00527 1	00004 0
26,3700	06032 0	C: 55043 0	05155 0	C: 25547 0	C: 33555 1	C: 01106 1	C: 01642 0	C: 11045 0
26,3710	C: 00001 0	C: 00001 1	C: 00454 1	C: 01130 1	C: 00000 1	C: 00226 1	I: 46020 1	C: 00050 1
26,3720	C: 55733 0	I: 77624 1	C: 51727 1	I: 77775 1	C: 02013 1	I: 52235 0	C: 00001 0	C: 00001 0
26,3730	I: 52105 1	C: 00025 0	C: 51715 0	I: 77624 1	C: 55742 1	I: 77624 1	C: 15761 0	I: 76521 0
26,3740	C: 00025 0	I: 77656 1	C: 55725 1	I: 40220 0	C: 00051 0	C: 00011 1	I: 77770 1	C: 00000 1
26,3750	I: 65245 0	C: 01712 1	C: 14021 1	C: 45006 0	C: 53712 0	I: 41401 1	C: 00023 0	I: 65246 0
26,3760	C: 00023 0	I: 65356 1	C: 06524 1	I: 73525 1	C: 00023 0	I: 65276 1	C: 00023 0	I: 63246 0
26,3770	C: 06524 1	I: 41525 0	C: 06522 1	I: 77650 1	C: 00051 0	C: 03775 1	C: 03776 1	CKSM 67721 1

OCTAL LISTING FOR PARAGRAPH # 154, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

27,2000	C: 0000 1	C: 07622 0	C: 00000 1	C: 00762 1	C: 00000 1	C: 35104 1	C: 00016 0	C: 36237 1
27,2010	C: 35711 0	C: 35663 1	C: 03631 0	C: 23146 0	C: 33226 1	C: 14632 0	C: 05306 1	C: 15503 0
27,2020	C: 26337 1	C: 21000 1	C: 55340 0	C: 61710 0	C: 03172 1	C: 16206 1	C: 09344 1	C: 24331 0
27,2030	C: 24775 1	C: 31424 0	I: 40021 1	C: 03325 0	C: 56025 1	I: 52164 0	C: 03246 1	C: 56046 0
27,2040	I: 40020 1	C: 03325 0	C: 56043 0	I: 47164 1	C: 03246 1	C: 44403 0	C: 34032 1	C: 44410 1
27,2050	I: 61375 1	C: 03773 1	C: 03247 0	I: 77656 1	C: 00035 1	I: 53435 0	C: 03765 0	I: 57400 1
27,2060	C: 56170 1	C: 17271 0	C: 01045 0	I: 50025 0	C: 14415 1	C: 56170 1	I: 50375 0	C: 03765 0
27,2070	C: 00035 1	I: 65552 0	I: 77624 1	C: 44527 1	I: 75160 1	C: 03246 1	C: 02230 1	I: 77624 1
27,2100	C: 44312 1	I: 51545 1	C: 00007 0	I: 50025 0	C: 14402 1	C: 56160 0	I: 51545 1	C: 03765 0
27,2110	I: 51025 1	C: 14404 1	C: 56160 0	I: 77775 1	I: 77626 0	C: 50514 1	I: 77626 0	C: 50522 1
27,2120	I: 77626 0	C: 50530 1	C: 03255 0	I: 57444 1	C: 56125 1	I: 50035 1	C: 03765 0	C: 56134 1
27,2130	I: 57575 1	C: 03765 0	C: 37271 1	C: 56137 1	I: 77775 1	C: 03765 0	C: 03271 0	I: 51545 1
27,2140	C: 03765 0	I: 51025 1	C: 14406 0	C: 56147 0	I: 52145 0	C: 14412 0	C: 56151 1	I: 77745 1
27,2150	C: 14410 1	I: 77624 1	C: 44527 1	I: 75160 1	C: 03246 1	C: 02230 1	I: 77624 1	C: 44312 1
27,2160	I: 45160 1	C: 00000 1	C: 44654 0	I: 40234 0	C: 21621 1	C: 00001 0	I: 77650 1	C: 03325 0
27,2170	I: 50375 0	C: 00035 1	C: 03765 0	I: 72240 1	C: 54354 1	C: 00032 0	I: 77650 1	C: 03325 0
27,2200	22062 0	24002 0	00006 1	22061 0	54063 0	75012 0	64741 1	54064 1
27,2210	45012 0	77063 0	54063 0	22007 0	50001 0	41410 1	60064 0	00006 1
27,2220	12232 1	44747 0	60001 0	00006 1	12230 0	24001 0	24001 0	12214 0
27,2230	52062 1	52006 0	45012 0	50001 0	71411 0	00006 1	60063 1	00006 1
27,2240	12242 0	12221 0	34353 0	50001 0	55410 1	12230 0	I: 71220 1	C: 02632 0
27,2250	C: 03442 0	C: 03763 1	I: 77614 1	C: 01347 0	C: 56336 1	I: 77201 1	C: 00001 0	C: 03650 1
27,2260	C: 02331 1	I: 53435 0	C: 03642 1	C: 27673 0	C: 03642 1	C: 02323 1	I: 65236 0	C: 00045 0
27,2270	I: 56235 0	C: 16412 1	I: 41205 0	C: 03664 0	C: 01244 1	I: 77671 1	C: 03735 0	C: 24017 1
27,2300	C: 03656 1	I: 74241 0	C: 03673 0	C: 03673 0	I: 41552 0	I: 65245 1	C: 03656 1	C: 00017 1
27,2310	I: 63356 1	C: 00007 0	I: 53435 0	C: 03673 0	I: 45561 1	C: 50776 0	I: 65256 0	C: 00017 1
27,2320	I: 74346 0	I: 74255 0	C: 03701 1	C: 00045 0	I: 53352 0	I: 77626 0	C: 74076 0	I: 77656 1
27,2330	C: 27673 0	C: 03701 1	I: 45006 0	C: 15741 1	I: 77650 1	C: 03632 0	I: 77745 1	C: 03442 0
27,2340	C: 00041 1	I: 77621 1	C: 03631 0	C: 37452 0	C: 27060 1	I: 40375 1	C: 00001 0	C: 00001 0
27,2350	C: 03642 1	C: 02323 1	I: 77656 1	C: 27537 0	C: 00007 0	C: 03650 1	C: 02331 1	I: 65345 0
27,2360	C: 06524 1	C: 16406 1	I: 43214 1	C: 03745 1	C: 56366 1	C: 16410 1	I: 66006 1	C: 02776 0
27,2370	I: 45134 0	C: 02777 1	C: 22000 1	I: 41575 0	C: 02366 0	C: 03701 1	I: 77656 1	C: 17673 0

OCTAL LISTING FOR PARAGRAPH # 155, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

27,2400	C: 00045 0	C: 37664 1	C: 15741 1	I: 77650 1	C: 03622 0	C: 00707 1	C: 03424 1	C: 03070 0
27,2410	C: 34344 0	C: 00024 1	C: 13714 1	I: 77775 1	C: 03672 0	I: 76521 0	C: 01734 0	C: 27773 1
27,2420	C: 06522 1	C: 27765 0	C: 03673 0	C: 03607 0	I: 53435 0	C: 03642 1	I: 46125 0	C: 00045 0
27,2430	C: 56441 0	I: 45575 1	C: 74162 1	I: 76435 1	C: 03607 0	I: 77676 0	C: 03623 0	I: 43414 1
27,2440	C: 01073 1	I: 47375 0	C: 03607 0	C: 03650 1	I: 41456 0	I: 77650 1	C: 56421 1	I: 77614 1
27,2450	C: 01347 0	C: 56731 1	I: 52375 1	C: 03701 1	C: 03527 1	C: 03707 1	I: 76521 0	C: 01734 0
27,2460	C: 03254 1	I: 51575 1	C: 03707 1	C: 03664 0	I: 77201 1	C: 00001 0	C: 02707 1	C: 27701 1
27,2470	C: 03527 1	I: 57414 1	C: 01344 0	C: 00052 0	I: 77656 1	I: 41441 0	C: 03707 1	I: 56244 0
27,2500	C: 56526 0	C: 03743 1	I: 41215 1	C: 06522 1	I: 56261 1	C: 20612 1	C: 00045 0	I: 43205 1
27,2510	C: 16535 0	C: 03741 0	C: 03517 1	I: 77615 0	C: 01234 0	C: 17442 0	C: 03517 1	I: 51025 1
27,2520	C: 16537 1	C: 61076 1	I: 43014 0	C: 01066 0	C: 01224 1	C: 00052 0	I: 77776 1	05567 0
27,2530	C: 01407 0	06042 1	I: 77650 1	C: 61076 1	C: 77715 1	C: 77777 0	C: 00000 1	C: 00620 0
27,2540	06042 1	I: 43001 1	C: 00001 0	C: 01266 1	I: 51575 1	C: 03701 1	I: 41325 0	C: 21006 1
27,2550	C: 34021 0	I: 72471 0	C: 01244 1	I: 41421 0	I: 43014 0	C: 05342 1	C: 56626 0	C: 02463 1
27,2560	I: 56345 0	C: 16061 1	C: 01244 1	I: 50021 1	C: 00001 0	C: 56610 0	I: 41325 0	C: 03737 1
27,2570	C: 16700 1	I: 65221 0	C: 01244 1	C: 03735 0	I: 60405 0	C: 16702 0	I: 41471 0	I: 51021 0
27,2600	C: 00003 1	C: 56626 0	I: 55345 0	I: 43205 1	C: 16702 0	C: 16676 1	I: 77650 1	C: 56616 0
27,2610	I: 41345 0	C: 01244 1	I: 41542 1	I: 56215 1	C: 16002 0	C: 16005 0	I: 77414 0	C: 01066 0
27,2620	07262 0	30154 1	56001 0	34755 1	53517 1	12650 1	I: 41345 0	C: 00001 0
27,2630	C: 01244 1	I: 43000 0	C: 05302 0	C: 56671 1	I: 43071 0	C: 16007 1	C: 02662 0	I: 41400 0
27,2640	C: 56653 1	I: 51025 1	C: 16704 0	C: 56661 0	I: 52015 1	C: 16704 0	C: 56616 0	I: 77776 1
27,2650	05353 1	C: 00003 1	05155 0	I: 40545 1	I: 77671 1	C: 16011 0	C: 03517 1	I: 77776 1
27,2660	12650 1	I: 51025 1	C: 16706 1	C: 56666 1	I: 77614 1	C: 02463 1	I: 77745 1	I: 77776 1
27,2670	12620 0	I: 62471 1	C: 34007 1	I: 77650 1	C: 56667 0	C: 00144 0	C: 00000 1	C: 01274 1
27,2700	C: 00000 1	C: 00744 1	C: 00000 1	C: 01120 1	C: 00000 1	C: 21304 0	C: 00000 1	06042 1
27,2710	I: 77601 0	C: 00001 0	I: 71214 0	C: 01072 0	C: 06524 1	I: 77725 1	C: 16406 1	I: 43214 1
27,2720	C: 03745 1	C: 56723 1	C: 16410 0	I: 45006 0	C: 22002 0	I: 77776 1	05353 1	C: 00002 0
27,2730	15155 1	I: 51575 1	C: 01220 0	I: 53744 0	C: 02777 1	C: 57576 1	C: 27715 1	C: 03444 0
27,2740	I: 47051 0	C: 01220 0	C: 21725 1	C: 17656 1	C: 00045 0	I: 53674 1	C: 00046 0	C: 57576 1
27,2750	C: 00037 0	I: 41301 0	C: 00050 1	C: 03715 1	I: 57101 0	C: 00047 1	C: 00046 0	I: 77734 1
27,2760	C: 03766 0	C: 17725 1	C: 00037 0	I: 65342 1	C: 03715 1	I: 65342 1	C: 03723 1	I: 43342 0
27,2770	I: 45415 0	C: 74044 1	I: 41225 1	C: 00037 0	C: 03721 0	I: 77621 1	C: 03717 0	I: 45325 1

OCTAL LISTING FOR PARAGRAPH # 156, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "1" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

27,3000	C: 03733 0	C: 03715 1	I: 71501 1	C: 00047 1	I: 41271 0	C: 03725 1	I: 53664 0	C: 00046 0
27,3010	C: 57575 1	I: 77754 1	C: 03766 0	I: 75366 0	C: 02673 1	C: 00041 1	I: 41345 0	C: 03733 0
27,3020	C: 03721 0	I: 77621 1	C: 03717 0	I: 45325 1	C: 03733 0	C: 03723 1	I: 70501 1	C: 00047 1
27,3030	I: 41271 0	C: 03725 1	I: 53664 0	C: 00046 0	C: 57575 1	I: 65366 1	C: 03733 0	I: 56225 1
27,3040	C: 00037 0	C: 03733 0	I: 41566 1	I: 67542 0	I: 65205 0	C: 17216 1	I: 56325 0	C: 00037 0
27,3050	C: 03733 0	I: 77600 1	C: 57053 0	I: 41366 1	I: 44242 0	I: 65365 1	C: 02673 1	C: 17216 1
27,3060	I: 45302 1	I: 65205 0	C: 03733 0	C: 03733 0	I: 75442 1	I: 77605 1	I: 52525 1	C: 03717 0
27,3070	I: 55366 1	I: 43225 0	C: 03621 0	C: 01234 0	C: 14037 0	I: 77765 0	C: 00037 0	C: 00037 0
27,3100	I: 77214 0	C: 03705 0	C: 57123 0	C: 03656 1	I: 53451 1	C: 03537 0	I: 63361 0	C: 00037 0
27,3110	C: 03656 1	I: 53455 0	C: 03537 0	I: 53361 0	C: 00041 1	I: 53744 0	C: 02777 1	C: 57177 1
27,3120	C: 02337 1	I: 77650 1	C: 57166 1	I: 50375 0	C: 03656 1	C: 03537 0	I: 77240 1	C: 57146 0
27,3130	C: 03656 1	I: 63362 0	C: 03537 0	I: 53362 0	I: 77656 1	I: 57406 1	I: 75235 1	C: 02674 0
27,3140	C: 02673 1	I: 74256 0	C: 00037 0	I: 77715 1	I: 77650 1	C: 57113 0	I: 74575 0	C: 03537 0
27,3150	I: 74515 0	C: 03656 1	I: 53451 1	I: 77606 1	I: 75225 1	C: 02674 0	C: 02673 1	I: 74256 0
27,3160	C: 00041 1	I: 77715 1	I: 53361 0	C: 00037 0	I: 77650 1	C: 57115 0	I: 77651 0	C: 03553 1
27,3170	C: 02366 0	I: 53125 0	C: 03000 1	C: 57177 1	I: 52175 0	C: 02366 0	C: 57212 1	I: 53575 0
27,3200	C: 01220 0	I: 45345 1	C: 01234 0	C: 03512 1	I: 56205 0	C: 16023 1	C: 00043 0	I: 53361 0
27,3210	C: 03521 1	C: 02366 0	C: 02366 0	I: 77650 1	C: 56455 0	C: 21103 1	C: 36652 0	05516 0
27,3220	C: 00137 1	45017 0	00006 1	03012 1	35014 1	00006 1	05012 1	05221 0
27,3230	C: 13560 0	45014 0	00006 1	03012 1	35017 1	00006 1	05012 1	31402 0
27,3240	55173 1	C: 03260 0	31401 0	05224 0	44740 1	00006 1	03012 1	30102 1
27,3250	74742 0	00006 1	13264 0	34737 0	05072 1	C: 02325 1	C: 02067 1	05261 1
27,3260	44742 0	00006 1	03012 1	13247 1	05504 0	C: 00137 1	05261 1	I: 76521 0
27,3270	C: 01734 0	I: 77650 1	C: 47650 1	I: 50375 0	C: 03254 1	C: 02146 0	I: 51025 1	C: 02571 0
27,3300	C: 57307 1	I: 50375 0	C: 02146 0	C: 03537 0	I: 50025 0	C: 02573 1	C: 71450 0	I: 77614 1
27,3310	C: 04631 1	C: 03722 0	I: 50375 0	C: 03537 0	C: 03720 1	I: 41312 1	C: 03631 0	C: 02335 0
27,3320	I: 77616 0	00006 1	33257 0	52252 1	40102 1	74745 1	26103 1	34735 1
27,3330	54107 0	00006 1	34755 1	52752 0	30102 1	74744 0	10000 0	13343 1
27,3340	00006 1	34755 1	52754 0	00006 1	34755 1	52756 1	00006 1	34755 1
27,3350	52764 0	34764 0	54001 1	40000 0	52760 1	15634 1	C: 03761 1	C: 64067 1
27,3360	C: 00037 0	I: 53575 0	C: 02207 0	I: 77725 1	C: 00045 0	C: 00015 0	I: 77701 1	C: 00047 1
27,3370	C: 24041 1	C: 02215 0	I: 77761 1	C: 00037 0	C: 02170 0	I: 47361 0	C: 00041 1	I: 47572 1

OCTAL LISTING FOR PARAGRAPH # 157, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

27,3400	C: 14035 1	C: 06514 1	I: 63271 0	C: 00041 1	C: 02170 0	I: 57436 1	C: 00025 0	I: 43257 0
27,3410	C: 20572 1	I: 77626 0	C: 77744 0	I: 41457 1	C: 20172 0	I: 75446 0	I: 77701 1	C: 00050 1
27,3420	C: 00031 0	I: 75316 1	I: 55254 1	C: 57425 0	C: 06514 1	C: 00027 1	I: 77616 0	I: 41245 0
27,3430	C: 00033 1	C: 00035 1	I: 57457 0	C: 20571 0	I: 51415 0	C: 17765 0	I: 43366 0	C: 06514 1
27,3440	I: 55206 0	C: 00035 1	I: 53657 0	C: 20601 1	C: 20572 0	C: 14017 1	I: 41005 1	C: 00027 1
27,3450	C: 57753 1	I: 53654 0	C: 57461 0	C: 57603 0	I: 40057 1	C: 57576 1	C: 57461 0	I: 77644 1
27,3460	C: 57463 1	I: 77745 1	C: 17771 0	C: 00021 1	I: 77616 0	I: 77614 1	C: 03436 0	C: 57472 1
27,3470	I: 77614 1	C: 03676 0	C: 00023 0	I: 77657 0	C: 20201 0	C: 00021 1	I: 44205 0	C: 00033 1
27,3500	C: 06514 1	I: 41206 0	C: 00021 1	I: 53725 1	C: 00035 1	C: 20573 1	I: 43276 0	I: 77657 0
27,3510	C: 20611 1	I: 71214 0	C: 03756 0	C: 57515 1	C: 06524 1	I: 75440 0	C: 57650 0	I: 41076 0
27,3520	C: 57753 1	C: 24045 0	C: 02170 0	I: 52441 1	C: 02207 0	C: 00017 1	I: 44240 1	C: 57550 0
27,3530	C: 00045 0	C: 14043 0	C: 00033 1	I: 44205 0	C: 00041 1	I: 51406 1	I: 40015 1	C: 17757 1
27,3540	C: 57561 1	I: 65345 0	C: 06524 1	I: 57545 1	C: 00033 1	I: 71240 1	C: 57655 0	I: 77616 0
27,3550	I: 77745 1	I: 45345 1	C: 00023 0	C: 00015 0	C: 14043 0	C: 00045 0	I: 52015 1	C: 00017 1
27,3560	C: 57535 0	I: 65215 1	C: 17761 1	C: 00043 0	I: 53605 1	C: 00031 0	C: 57201 0	I: 77671 1
27,3570	I: 40145 0	C: 00043 0	C: 57653 0	I: 45471 1	C: 77732 1	I: 63406 0	I: 41206 0	C: 00035 1
27,3600	I: 75261 0	C: 20206 1	C: 00045 0	C: 14045 0	I: 41206 0	C: 00033 1	I: 77657 0	C: 20201 0
27,3610	C: 00143 0	I: 41234 1	C: 57735 1	I: 44302 0	C: 00023 0	I: 41215 1	C: 00015 0	I: 51042 0
27,3620	C: 57641 0	I: 75206 1	C: 00017 1	I: 71244 0	C: 57645 1	C: 00027 1	I: 51076 1	C: 57645 1
27,3630	I: 77676 0	I: 56205 0	C: 17755 0	C: 00031 0	I: 53657 0	C: 57602 1	C: 57602 1	I: 43257 0
27,3640	C: 57576 1	I: 41005 0	C: 00037 0	C: 57651 1	I: 77616 0	I: 77745 1	I: 77650 1	C: 57641 0
27,3650	I: 77745 1	I: 43545 1	C: 17771 0	I: 77712 0	I: 41465 0	I: 45345 1	C: 00045 0	C: 00017 1
27,3660	C: 14012 0	I: 77626 0	C: 77732 1	I: 53605 1	C: 00027 1	C: 57576 1	I: 41206 0	C: 00045 0
27,3670	I: 41057 0	C: 57576 1	C: 21713 1	C: 00043 0	I: 41234 1	C: 57735 1	C: 00043 0	I: 45242 1
27,3700	C: 17763 0	I: 41405 0	I: 41345 0	C: 00045 0	C: 00015 0	I: 43212 0	C: 00017 1	C: 14045 0
27,3710	C: 00035 1	I: 53605 1	C: 00027 1	C: 57575 1	I: 53765 0	C: 00045 0	C: 57576 1	C: 14045 0
27,3720	C: 00027 1	I: 41266 1	C: 17755 0	I: 77615 0	I: 45257 0	C: 57577 0	C: 00013 0	I: 53605 1
27,3730	C: 00027 1	C: 57611 1	I: 52057 1	C: 57602 1	C: 57641 0	67225 0	C: 00004 0	C: 12525 0
27,3740	C: 12525 0	C: 71463 0	C: 57703 1	C: 04423 0	C: 17645 0	C: 74604 0	C: 43667 1	C: 01626 1
27,3750	C: 37256 1	C: 77414 1	C: 52071 0	66064 0	C: 62220 1	C: 37553 0	C: 37777 1	C: 37700 1
27,3760	C: 00000 1	C: 00100 0	C: 04000 0	C: 00000 1	C: 02000 0	C: 00000 1	C: 00305 1	C: 11205 0
27,3770	C: 37777 1	C: 37777 1	C: 03772 0	C: 03772 1	CKSM 44173 1	a	a	a

OCTAL LISTING FOR PARAGRAPH # 160, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "A" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

30,2000	C: 02445 0	C: 00274 0	I: 77615 0	C: 02201 0	C: 02201 0	I: 47573 0	C: 02555 0	I: 77615 0
30,2010	C: 02213 1	C: 02203 1	I: 47573 0	C: 02643 1	I: 77615 0	C: 02205 1	C: 02205 1	I: 75500 0
30,2020	C: 62137 0	I: 77661 0	C: 20613 1	C: 16205 1	C: 02203 1	I: 77766 0	C: 16203 1	C: 02201 0
30,2130	I: 77766 0	C: 02201 0	I: 52000 0	C: 60035 1	C: 60042 1	I: 77745 1	C: 06532 0	C: 02201 0
30,2040	C: 02203 1	C: 02205 1	I: 45345 1	C: 02201 0	C: 20060 0	I: 71240 1	C: 60051 0	C: 20060 0
30,2050	C: 02211 0	I: 66150 0	C: 06051 0	C: 00052 0	I: 77776 1	04635 0	C: 27423 1	C: 01670 1
30,2060	C: 17000 1	05353 1	C: 04024 0	04616 1	C: 11236 0	06011 1	36000 1	55250 0
30,2170	34751 0	55515 0	34755 1	55462 1	33022 1	04616 1	C: 20477 1	16001 1
30,2100	12102 1	12174 1	05353 1	C: 04024 0	06042 1	I: 43014 0	C: 03067 0	C: 06464 1
30,2110	I: 43014 0	C: 00075 0	C: 00270 1	I: 43014 0	C: 04464 0	C: 04461 0	I: 77624 1	C: 71543 0
30,2120	I: 77624 1	C: 60251 1	I: 77745 1	C: 25753 1	C: 17517 1	C: 03442 0	C: 34041 0	C: 27060 1
30,2130	I: 64375 1	C: 00037 0	C: 01734 0	I: 77772 0	C: 27601 0	C: 05001 0	I: 52521 0	C: 01734 0
30,2140	C: 37521 0	C: 67067 1	I: 53575 0	C: 03521 1	C: 37537 1	C: 57312 0	I: 57461 0	C: 20606 0
30,2150	C: 17643 0	C: 31367 1	C: 16277 1	C: 21371 0	C: 02273 0	I: 77776 1	05353 1	C: 04024 0
30,2160	33021 1	04616 1	C: 20477 1	16001 1	12166 0	12160 0	32314 0	55455 0
30,2170	05353 1	C: 04024 0	06042 1	I: 54345 1	C: 03643 0	C: 20206 1	I: 77615 0	C: 02335 0
30,2200	C: 27633 1	C: 03537 0	I: 53361 0	C: 31365 0	C: 03601 0	C: 02527 1	I: 72441 0	C: 03537 0
30,2210	C: 27474 0	C: 03537 0	I: 53435 0	C: 03720 1	C: 37726 0	C: 60315 0	I: 77745 1	C: 02361 1
30,2220	I: 65316 0	C: 02355 0	I: 42316 1	I: 75454 0	C: 60230 0	I: 55352 0	C: 02355 0	I: 77736 0
30,2230	C: 26353 0	C: 03254 1	I: 50256 0	C: 73537 0	I: 65552 0	I: 77676 0	C: 02365 0	I: 77776 1
30,2240	05353 1	C: 04024 0	00004 0	04674 0	C: 40143 0	05516 0	C: 00212 1	04635 0
30,2250	C: 74130 0	I: 77745 1	C: 16013 1	C: 03641 1	C: 03627 0	C: 17635 1	C: 16017 0	C: 16263 1
30,2260	C: 16021 0	C: 16271 1	C: 34013 1	I: 54276 0	C: 20214 1	C: 02267 0	I: 57535 0	C: 26001 1
30,2270	I: 77702 1	C: 02265 1	I: 43414 1	C: 04747 1	C: 60275 1	I: 43345 1	C: 25751 0	C: 02333 0
30,2300	C: 17631 0	C: 06524 1	C: 03654 0	C: 03633 1	C: 26275 0	C: 01563 0	I: 64225 1	C: 01555 0
30,2310	C: 01734 0	I: 77656 1	C: 03720 1	I: 77616 0	C: 02024 0	I: 51575 1	C: 03521 1	C: 26301 1
30,2320	C: 03726 1	I: 72441 0	C: 03527 1	C: 26313 1	C: 03726 1	I: 76435 1	C: 03537 0	C: 02303 0
30,2330	I: 72441 0	C: 03527 1	C: 36311 1	C: 57312 0	I: 77775 1	C: 03563 1	I: 50341 1	C: 27106 0
30,2340	C: 03537 0	I: 47315 0	C: 03537 0	C: 03527 1	I: 56236 0	C: 02301 1	I: 43352 1	I: 77626 0
30,2350	C: 75462 0	I: 45014 0	C: 04742 1	C: 60355 1	C: 71524 1	I: 45345 1	C: 02277 1	C: 02313 1
30,2360	C: 02343 1	I: 65361 0	C: 03726 1	C: 02275 0	I: 77625 0	C: 02311 0	C: 02341 0	I: 65261 0
30,2370	C: 02303 1	C: 02273 0	I: 77625 0	C: 03474 1	C: 02337 1	I: 53361 0	C: 03537 0	I: 76455 1

OCTAL LISTING FOR PARAGRAPH # 161, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENOTES UNLSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

30,2400	I: 77626 0	C: 74131 1	I: 41345 0	C: 03517 1	C: 02315 1	I: 76561 1	C: 03537 0	I: 77645 0
30,2410	C: 03646 0	C: 03646 0	I: 76521 0	C: 02146 0	C: 27502 0	C: 03646 0	I: 43046 1	C: 04745 0
30,2420	C: 60427 0	I: 77671 1	C: 27031 1	C: 37517 0	C: 71475 1	I: 77659 1	C: 60754 1	I: 41471 0
30,2430	C: 02265 1	I: 44342 1	C: 17771 0	I: 41205 0	C: 02271 1	I: 77625 0	C: 02267 0	C: 03517 1
30,2440	I: 57461 0	C: 20614 0	C: 17454 1	C: 03517 1	I: 45214 1	C: 03710 1	C: 60452 1	C: 21006 1
30,2450	I: 77640 0	C: 30347 1	I: 77745 1	C: 03517 1	I: 50025 0	C: 21010 0	C: 60612 1	I: 45345 1
30,2460	C: 02271 1	C: 03517 1	I: 45071 0	C: 02271 1	C: 61023 1	I: 41461 1	C: 20206 1	I: 44265 0
30,2470	C: 03517 1	C: 02271 1	I: 43006 0	C: 04703 1	C: 60502 1	I: 45345 1	C: 03517 1	C: 21012 1
30,2500	I: 43144 0	C: 60510 0	C: 04463 1	I: 77745 1	C: 06524 1	C: 02351 1	C: 36353 1	C: 60572 1
30,2510	I: 45345 1	C: 03517 1	C: 00003 1	I: 72406 0	I: 52421 1	C: 03517 1	I: 41325 0	C: 03517 1
30,2520	C: 03474 0	I: 45215 0	C: 02301 1	C: 03631 0	I: 41325 0	C: 02337 1	C: 00005 1	I: 62415 0
30,2530	I: 56271 0	C: 00007 0	C: 03517 1	C: 02351 1	I: 71240 1	C: 60541 1	C: 06524 1	C: 36351 0
30,2540	C: 60553 1	I: 56202 1	C: 02271 1	I: 51025 1	C: 26201 0	C: 60553 1	I: 41345 0	C: 26201 0
30,2550	C: 02271 1	I: 77612 1	C: 12251 1	I: 77745 1	C: 03517 1	I: 43205 1	C: 02311 0	C: 02335 0
30,2560	I: 65225 1	C: 03633 1	C: 02341 0	I: 43205 1	C: 00005 1	I: 56312 1	I: 40271 1	C: 03517 1
30,2570	C: 00005 1	C: 62353 0	I: 41345 0	C: 02351 1	C: 00003 1	I: 56325 0	C: 02337 1	C: 00001 0
30,2600	I: 45312 1	I: 77626 0	C: 61432 0	C: 02353 0	I: 65205 0	I: 60465 0	C: 02341 0	I: 77625 0
30,2610	C: 00101 0	C: 02347 0	I: 43001 1	C: 00001 0	C: 04742 1	C: 60620 0	I: 77624 1	C: 71501 0
30,2620	I: 41345 0	C: 27106 0	C: 02351 1	I: 56215 1	C: 02345 1	C: 02271 1	I: 45352 1	C: 02315 1
30,2630	C: 16357 1	C: 27106 0	I: 43205 1	C: 02353 0	C: 02347 0	I: 72471 0	C: 02271 1	C: 02355 0
30,2640	I: 65361 0	C: 12312 0	C: 02357 1	I: 53361 0	C: 03537 0	I: 41572 1	I: 65246 1	C: 02263 1
30,2650	I: 45316 1	C: 00043 0	I: 41525 0	C: 02263 1	I: 45316 1	C: 00043 0	I: 71240 1	C: 60663 1
30,2660	C: 00111 1	I: 52166 1	C: 60671 1	I: 55345 0	C: 00007 0	I: 77761 1	C: 00001 0	C: 14001 0
30,2670	C: 06524 1	I: 77765 0	C: 02343 1	C: 02361 1	I: 77761 1	C: 03726 1	I: 53372 1	C: 00001 0
30,2700	C: 03254 1	I: 43001 1	C: 00001 0	C: 04704 0	C: 60216 1	I: 77614 1	C: 04701 0	C: 60763 0
30,2710	I: 57575 1	C: 03517 1	C: 17262 1	C: 03654 0	I: 51025 1	C: 01234 0	C: 60730 0	I: 77614 1
30,2720	C: 04711 1	C: 57273 1	I: 43014 0	C: 06666 1	C: 04702 0	C: 60720 0	I: 77614 1	C: 01664 1
30,2730	I: 77776 1	30105 0	74742 0	10000 0	12755 0	66042 1	I: 77624 1	C: 61076 1
30,2740	I: 77776 1	30105 0	74742 0	10000 0	12755 0	30104 1	74742 0	10000 0
30,2750	12755 0	33100 0	04616 1	C: 20444 1	I: 77776 1	15155 1	I: 77776 1	00004 0
30,2760	04674 0	C: 40166 1	12741 0	I: 45345 1	C: 02301 1	C: 02333 0	I: 50025 0	C: 26205 1
30,2770	C: 16667 1	I: 43014 0	C: 04661 1	C: 04711 1	C: 60710 1	I: 43345 1	C: 01234 0	C: 25747 1

OCTAL LISTING FOR PARAGRAPH # 162, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

30,3000	C: 37654 1	C: 60710 1	I: 77614 1	C: 04621 1	C: 60771 0	C: 00062 0	C: 00000 1	C: 00031 0
30,3010	C: 00000 1	C: 00175 1	C: 00000 1	C: 00045 0	C: 20000 0	C: 00010 0	C: 14400 0	C: 00000 1
30,3020	C: 01477 1	C: 01514 0	C: 01441 1	I: 44301 0	C: 00162 0	C: 17771 0	I: 77776 1	C: 07225 0
30,3030	C: 00006 1	C: 00000 1	C: 00002 0	C: 76777 1	C: 77175 1	C: 77400 0	C: 75416 0	C: 77507 0
30,3040	C: 65515 0	C: 77741 1	C: 63547 1	C: 77052 0	C: 55372 0	C: 01167 0	C: 30361 0	C: 76520 1
30,3050	C: 75267 0	34755 1	54156 1	00006 1	33070 0	52155 1	52132 0	30162 1
30,3060	07312 0	52155 1	52155 1	52132 0	20155 1	06042 1	I: 43476 0	C: 00542 1
30,3070	C: 34414 1	I: 77775 1	C: 66522 1	C: 03270 1	C: 03262 1	I: 77616 0	I: 77775 1	C: 03254 1
30,3100	I: 40200 1	C: 61100 1	C: 00023 1	I: 77420 1	C: 03247 0	33746 1	56003 1	55646 0
30,3110	C: 00111 0	74737 1	10000 0	34753 1	55650 1	34743 0	55652 0	70111 1
30,3120	55651 0	00004 0	00022 0	54771 1	30033 1	54765 1	30024 0	54767 0
30,3130	34742 1	00006 1	02030 0	10000 0	13151 0	34736 1	00006 1	02031 1
30,3140	10000 0	13151 0	55652 0	31635 0	54771 1	21636 0	54765 1	21637 1
30,3150	54767 0	06042 1	I: 77624 0	C: 21727 0	C: 24001 0	C: 03262 1	I: 47034 0	C: 21727 0
30,3160	C: 47617 1	C: 24015 0	C: 00325 0	I: 53404 1	C: 61735 1	I: 45000 0	C: 61202 0	C: 47673 0
30,3170	I: 77776 1	31671 0	22157 1	03470 1	55671 1	31673 1	22161 1	03470 1
30,3200	55673 0	06042 1	I: 46135 1	C: 02252 1	C: 61210 0	I: 45175 0	C: 00015 0	C: 61510 1
30,3210	I: 77775 1	C: 02162 0	C: 34015 1	C: 61510 1	I: 57575 1	C: 02146 0	C: 00015 0	I: 47375 0
30,3220	C: 00015 0	C: 00001 0	I: 41456 0	I: 76435 1	C: 00001 0	C: 00015 0	I: 63361 0	C: 03274 0
30,3230	I: 51361 1	C: 03272 0	I: 53372 1	C: 00001 0	I: 77656 1	C: 00001 0	I: 76435 1	C: 00015 0
30,3240	C: 00007 0	I: 47276 1	C: 00001 0	I: 77772 0	C: 00015 0	I: 77624 1	C: 61520 1	I: 77776 1
30,3250	30156 0	54001 1	33760 0	03714 0	56156 0	00006 1	20156 1	00006 1
30,3260	13262 0	13743 0	00004 0	22007 0	34752 0	54142 1	30001 0	00006 1
30,3270	70000 0	64352 0	00006 1	63276 1	34755 1	55651 0	50142 0	30154 0
30,3300	50142 0	54321 0	00006 1	50142 0	21625 1	40000 0	50142 0	55675 0
30,3310	54001 1	10142 1	13265 1	11652 0	13737 0	30101 1	74745 1	00006 1
30,3320	13737 0	23677 0	51650 0	33754 1	03714 0	55677 1	31676 1	00006 1
30,3330	70745 0	54001 1	51650 0	33756 0	03714 0	00006 1	10745 0	57676 1
30,3340	00006 1	70737 0	20001 1	40000 0	00006 1	21675 0	54001 1	51650 0
30,3350	33754 1	03714 0	55675 0	11651 0	41675 0	55675 0	41676 0	00006 1
30,3360	70737 0	20001 1	27675 0	41675 0	55643 0	41676 0	00006 1	70737 0
30,3370	20001 1	27643 0	27643 0	41676 0	00006 1	70747 1	20001 1	00006 1

OCTAL LISTING FOR PARAGRAPH # 164, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

31,2000	C: 00222 0	C: 33316 0	C: 07401 0	C: 06613 0	C: 00024 1	C: 00307 0	C: 17534 0	06042 1
31,2010	I: 77624 1	C: 62120 0	I: 77776 1	00006 1	31601 1	53607 0	00006 1	31603 0
31,2020	53611 1	00006 1	31605 0	53613 0	32143 0	04616 1	C: 20334 1	15472 1
31,2030	12032 0	12024 1	22007 0	34756 1	54002 1	50002 0	41600 1	50002 0
31,2040	61606 0	26001 1	10002 1	12034 0	22000 1	00006 1	12051 0	05504 0
31,2050	C: 00160 0	06042 1	I: 77414 0	C: 03707 1	C: 62056 0	15472 1	I: 77745 1	C: 02201 0
31,2060	I: 72412 0	C: 14001 0	C: 02203 1	C: 14003 1	C: 02205 1	I: 77661 0	C: 20213 0	C: 00005 1
31,2070	I: 72014 1	C: 04307 1	C: 62102 0	C: 00000 1	I: 72130 0	C: 02000 0	C: 00002 0	I: 52130 1
31,2100	C: 02001 1	C: 62110 0	I: 66150 0	C: 00000 1	C: 02006 0	I: 66150 0	C: 00002 0	C: 02007 1
31,2110	I: 66150 0	C: 00004 0	C: 12003 0	I: 77730 0	C: 02002 1	I: 77414 0	C: 02066 1	15472 1
31,2120	I: 40020 1	C: 00051 0	C: 62123 0	I: 45014 0	C: 03667 0	C: 27412 0	I: 71321 0	C: 00051 0
31,2130	C: 00006 1	C: 06524 1	C: 12201 0	C: 02203 1	C: 02205 1	I: 77770 1	C: 00066 1	I: 47573 0
31,2140	C: 02467 0	I: 77650 1	C: 60002 0	C: 01543 1	31245 0	00006 1	72345 0	00006 1
31,2150	23607 1	02326 1	53470 1	00006 1	31464 0	02326 1	55615 0	53466 0
31,2160	41617 1	60025 0	74733 0	40000 0	65002 0	00006 1	62172 1	00006 1
31,2170	31611 0	21470 1	35014 1	54003 0	00006 1	31507 1	52131 0	35016 0
31,2200	54003 0	44755 0	55606 1	40131 0	61620 1	00006 1	62220 0	40130 1
31,2210	61465 1	00006 1	62215 0	31467 0	12225 1	42002 0	61467 0	12227 0
31,2220	40131 0	61465 1	00006 1	62230 1	32003 0	53466 0	34737 0	55606 1
31,2230	03717 0	00006 1	31466 1	55620 0	53612 0	00006 1	41470 1	21613 0
31,2240	31612 0	61606 0	55614 1	54055 0	34750 1	00006 1	05014 1	20025 0
31,2250	55617 1	31762 0	54130 1	41010 0	62433 1	00006 1	12263 0	31234 0
31,2260	54130 1	35003 1	12264 1	35000 1	54002 1	00006 1	74746 1	22131 1
31,2270	40130 1	60025 0	62004 1	74357 0	22007 0	00006 1	10002 1	00006 1
31,2300	71612 1	60001 1	53611 1	11612 1	64753 1	12307 0	64753 1	00006 1
31,2310	71612 1	00006 1	10131 0	22007 0	21611 1	01607 1	34737 0	55606 1
31,2320	44755 0	55620 0	55612 1	00006 1	23607 1	12240 1	00006 1	22130 0
31,2330	52155 1	07106 1	C: 01243 0	07106 1	C: 02005 0	07262 0	30154 1	00006 1
31,2340	12343 0	34733 1	00131 0	52156 1	00130 0	C: 04143 0	12603 1	12603 1
31,2350	12566 1	12557 0	12763 0	12773 1	12664 0	12773 1	13041 0	13041 0
31,2360	13041 0	13514 0	13240 0	13225 0	13225 0	12411 1	13310 1	13331 1
31,2370	13337 1	13450 1	13453 1	13502 1	13712 1	13714 1	13714 1	C: 00000 1

OCTAL LISTING FOR PARACRAFT # 165, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

31,2400	C: 00000 1	C: 00034 0	I: 77776 1	34752 0	55647 1	12541 1	55647 1	12762 0
31,2410	05353 1	C: 00035 1	30101 1	74744 0	00006 1	13442 1	05353 1	C: 05023 0
31,2420	C: 20000 0	00006 1	00039 1	74747 0	10000 0	12503 1	05321 1	C: 00103 0
31,2430	12511 1	03717 0	05311 1	C: 00102 1	00006 1	31474 1	53645 0	06042 1
31,2440	I: 41535 1	C: 01457 0	I: 41535 1	C: 01455 1	I: 55535 1	C: 01453 1	I: 43161 0	C: 25546 1
31,2450	C: 00463 0	C: 26621 0	C: 01254 0	I: 77676 0	C: 27764 1	C: 06524 1	C: 17767 1	C: 02540 1
31,2460	C: 17757 1	C: 01234 0	C: 03760 0	I: 77776 1	34755 1	55620 0	55610 0	55611 1
31,2470	55647 1	34752 0	55621 1	55346 0	04616 1	C: 40166 1	05516 0	C: 00211 1
31,2500	05516 0	C: 00143 1	13514 0	05311 1	C: 00103 0	34755 1	55746 1	34263 0
31,2510	12470 0	41010 0	62433 1	00006 1	12532 0	34737 0	00006 1	02031 1
31,2520	10000 0	12537 0	41010 0	62433 1	00006 1	12532 0	31746 0	00006 1
31,2530	12537 0	12431 1	30075 0	74740 1	00006 1	12437 1	13514 0	34755 1
31,2540	55746 1	00006 1	31625 1	53574 1	03717 0	00006 1	31561 1	53625 0
31,2550	00006 1	31643 1	53553 1	11623 0	12603 1	51346 1	12347 1	05311 1
31,2560	C: 00101 1	44752 1	55647 1	05516 0	C: 00311 1	12603 1	05311 1	C: 00100 0
31,2570	31425 0	27552 0	00004 0	06022 1	34740 0	00006 1	05013 0	33727 0
31,2600	55343 0	05516 0	C: 00143 1	06042 1	I: 45345 1	C: 03625 0	C: 03574 1	I: 41461 1
31,2610	C: 21214 0	I: 47361 0	C: 03635 1	C: 02325 1	I: 47045 0	C: 03635 1	C: 21727 0	I: 76561 1
31,2620	C: 02333 0	C: 17545 0	I: 77776 1	52155 1	21553 1	03717 0	00006 1	31553 0
31,2630	53643 0	03663 1	27721 1	05146 1	06042 1	I: 53375 0	C: 03545 0	C: 02635 0
31,2640	C: 03635 1	I: 77646 0	C: 02333 0	I: 77776 1	03717 0	35014 1	54003 0	34755 1
31,2650	55634 0	55635 1	55636 1	55637 0	55640 0	55641 1	35016 0	54003 0
31,2660	34736 1	05146 1	51346 1	12353 1	30102 1	74746 1	00006 1	12773 1
31,2670	31666 0	00006 1	12773 1	00004 0	31446 0	55554 0	31445 0	55556 1
31,2700	03717 0	34755 1	55446 1	55445 1	55555 1	55557 0	30120 1	54166 1
31,2710	06042 1	I: 52375 1	C: 03635 1	C: 03521 1	I: 41434 1	C: 21727 0	I: 76435 1	C: 02154 0
31,2720	I: 65361 0	C: 03555 1	C: 03557 0	I: 52361 1	C: 02154 0	I: 41455 0	I: 45345 1	C: 00001 0
31,2730	C: 05660 1	I: 71240 1	C: 62735 1	C: 05660 1	C: 00001 0	I: 45345 1	C: 03635 1	C: 03521 1
31,2740	I: 74271 0	C: 00001 0	I: 53455 0	C: 03521 1	I: 76561 1	C: 02323 0	C: 03545 0	I: 77776 1
31,2750	03717 0	00006 1	31545 1	53635 1	00006 1	31547 0	53637 0	00006 1
31,2760	31551 1	53641 1	12773 1	06042 1	I: 64375 1	C: 00025 0	C: 01734 0	I: 53362 0
31,2770	C: 03254 1	C: 03527 1	I: 77776 1	06042 1	I: 47375 0	C: 03521 1	C: 02325 1	I: 70455 1

OCTAL LISTING FOR PARAGRAPH # 166, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

31,3000	C: 03527 1	C: 02265 1	I: 77721 0	C: 02575 1	C: 03627 1	I: 55525 0	C: 06524 1	I: 52446 0
31,3010	C: 26263 1	C: 03521 1	I: 41451 1	C: 03635 1	I: 76521 0	C: 02575 1	C: 02627 0	I: 77646 0
31,3020	C: 26617 0	I: 50234 1	C: 21727 0	C: 02146 0	I: 77776 1	30120 1	54166 1	30154 1
31,3030	60000 1	04616 1	C: 61657 1	63733 0	00006 1	73732 0	55667 0	51246 1
31,3040	12357 0	03656 1	I: 77743 1	C: 02431 0	C: 23571 0	C: 02427 1	C: 17567 0	C: 03633 1
31,3050	I: 42605 1	C: 05656 1	C: 02425 0	C: 23565 0	C: 02407 0	I: 41225 1	C: 02633 0	C: 05654 0
31,3060	C: 03563 1	I: 77776 1	34744 1	55572 1	00006 1	31643 1	52155 1	34752 0
31,3070	54001 1	33725 1	03532 0	51346 1	12375 0	00006 1	30155 0	53643 0
31,3100	03663 1	41642 1	61426 0	64733 1	54001 1	40001 1	60001 0	22007 0
31,3110	00006 1	11642 1	54131 0	00006 1	70000 0	54131 0	60130 0	56131 1
31,3120	60131 1	54154 0	50131 1	50120 1	54032 1	60131 1	50120 1	54034 1
31,3130	60130 0	64733 1	60131 1	60131 1	50120 1	54036 0	34755 1	54163 1
31,3140	03656 1	I: 65361 0	C: 03627 1	C: 00035 1	I: 62757 0	C: 02411 1	C: 02403 1	I: 70251 0
31,3150	C: 02627 0	C: 03643 0	I: 74342 1	C: 01033 1	I: 53255 0	I: 74341 1	C: 03643 0	C: 05656 1
31,3160	I: 73725 0	C: 00037 0	C: 02417 1	I: 77655 1	I: 76505 0	C: 02575 1	I: 70315 1	C: 01236 1
31,3170	C: 05652 0	I: 45445 0	C: 74523 0	I: 77646 0	C: 17464 1	C: 03254 1	I: 65316 0	C: 03256 0
31,3200	I: 65316 0	C: 05650 1	I: 63471 0	C: 01244 1	I: 45225 0	I: 71244 0	C: 63210 1	C: 06524 1
31,3210	I: 43366 0	C: 03261 0	I: 44244 0	C: 63216 1	C: 03260 0	C: 03260 0	I: 77776 1	03717 0
31,3220	31346 1	55621 1	25623 1	51346 1	12363 1	51346 1	31423 1	61642 0
31,3230	00006 1	63247 1	03717 0	31621 0	64753 1	55346 0	34755 1	55623 0
31,3240	35014 1	54103 0	00006 1	51346 1	52400 1	31435 1	24006 1	24006 1
31,3250	61642 0	56021 0	61642 0	10000 0	10001 1	13306 0	13306 0	13260 1
31,3260	03656 1	I: 53575 0	C: 03635 1	C: 16575 1	C: 03643 0	I: 74203 0	C: 02433 1	C: 02265 1
31,3270	I: 77655 1	C: 03635 1	I: 47051 0	C: 03521 1	C: 21727 0	I: 47035 1	C: 03635 1	C: 21727 0
31,3300	C: 26603 0	C: 02575 1	I: 76435 1	C: 02603 0	C: 02611 0	I: 77776 1	51621 0	12367 0
31,3310	06042 1	I: 47175 1	C: 03254 1	C: 21727 0	I: 74361 0	C: 03423 1	C: 22001 0	C: 03254 1
31,3320	I: 77776 1	11647 1	12406 0	11646 0	13327 0	05567 0	C: 01412 1	04635 0
31,3330	C: 65103 0	06042 1	I: 77775 1	C: 03537 0	C: 03262 1	I: 77776 1	13411 1	06042 1
31,3340	I: 52375 1	C: 03635 1	C: 03521 1	I: 77634 0	C: 21727 0	C: 03262 1	I: 50235 0	C: 02146 0
31,3350	C: 02603 0	I: 77776 1	40154 0	63734 1	64733 1	54130 1	40130 1	26130 1
31,3360	43735 1	61154 1	64733 1	54131 0	40131 0	26131 0	34751 0	76245 0
31,3370	54002 1	35014 1	54003 0	30130 0	00006 1	50002 0	71610 0	24006 1

OCTAL LISTING FOR PARAGRAPH # 170, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

32,2000	C: 00044 1	C: 70123 0	C: 41792 0	C: 13337 1	C: 10776 0	34737 0	70077 0	10000 0
32,2010	02017 0	05567 0	C: 00220 1	05472 0	00006 1	31014 1	53421 0	00006 1
32,2020	31421 1	53051 0	32172 1	04616 1	C: 20334 1	05472 0	02036 0	44746 1
32,2030	60154 1	00006 1	12014 1	00006 1	31051 1	02016 1	06042 1	I: 77614 1
32,2040	C: 01076 1	I: 77414 0	C: 02076 1	32172 1	04616 1	C: 20621 0	06042 1	I: 77634 0
32,2050	C: 21574 1	C: 34041 0	C: 27060 1	I: 77624 1	C: 64132 0	C: 16201 0	C: 06015 0	C: 34041 0
32,2060	C: 27044 1	I: 77624 1	C: 64132 0	C: 16207 0	C: 00015 0	I: 56225 1	C: 02021 0	C: 24175 1
32,2070	C: 02215 0	I: 77776 1	34753 1	54333 0	32176 0	04616 1	C: 01736 1	31221 0
32,2100	54333 0	34744 1	70074 0	10000 0	02122 1	11301 0	12111 0	12115 1
32,2110	12111 0	34363 0	04616 1	C: 01736 1	12105 0	04616 1	C: 16706 1	04616 1
32,2120	C: 17710 1	02122 1	05516 0	C: 00054 0	32173 0	04616 1	C: 20342 0	15472 1
32,2130	15472 1	05472 0	I: 64375 1	C: 00025 0	C: 01734 0	I: 72561 0	C: 24202 1	I: 53255 0
32,2140	C: 24204 1	C: 24212 0	I: 77634 0	C: 21773 1	C: 24025 0	C: 00017 1	I: 74321 1	C: 01734 0
32,2150	C: 24200 0	I: 53212 0	C: 24204 1	I: 47055 1	C: 24212 0	C: 21773 1	I: 77750 0	C: 00024 1
32,2160	I: 72130 0	C: 00155 0	C: 00026 0	I: 72130 0	C: 00160 0	C: 00030 1	I: 43530 0	C: 00162 1
32,2170	C: 00216 1	C: 14400 0	C: 01420 0	C: 14420 1	C: 03100 0	C: 00000 1	C: 03720 1	C: 15077 0
32,2200	C: 05041 1	C: 24402 1	C: 25724 1	C: 00000 1	C: 60000 1	C: 00000 1	C: 60000 1	C: 00000 1
32,2210	C: 60000 1	C: 00000 1	C: 37777 1	C: 00000 1	C: 37777 1	C: 00000 1	C: 37777 1	I: 77624 1
32,2220	C: 27412 0	I: 77745 1	C: 03442 0	C: 03661 0	C: 00041 1	I: 43014 0	C: 01674 0	C: 01673 1
32,2230	I: 43014 0	C: 01676 1	C: 01675 1	I: 77624 1	C: 27135 0	I: 77624 1	C: 11226 1	I: 77775 1
32,2240	C: 00017 1	C: 17631 0	C: 00015 0	C: 34041 0	C: 27412 0	I: 43014 0	C: 01474 1	C: 01673 1
32,2250	I: 43014 0	C: 01676 1	C: 02756 1	C: 64257 0	I: 43014 0	C: 01476 0	C: 01475 0	I: 77624 1
32,2260	C: 27135 0	I: 77624 1	C: 11226 1	I: 77775 1	C: 00025 0	C: 25761 0	C: 00017 1	C: 01101 0
32,2270	I: 53435 0	C: 01761 0	C: 24025 0	C: 03631 0	I: 53435 0	C: 00025 0	C: 27637 0	C: 01101 0
32,2300	I: 50256 0	C: 03637 0	I: 77752 1	C: 02732 0	I: 44316 0	C: 06514 1	I: 77766 0	C: 26730 1
32,2310	C: 01101 0	C: 26655 0	C: 01761 0	I: 77676 0	C: 32744 1	I: 45014 0	C: 03666 1	C: 24732 1
32,2320	I: 77676 0	C: 03645 0	I: 77745 1	C: 00037 0	C: 27663 1	C: 03645 0	I: 77646 0	C: 24025 0
32,2330	C: 00001 0	C: 03653 1	I: 53435 0	C: 03631 0	I: 53435 0	C: 03653 1	I: 76561 1	C: 00025 0
32,2340	C: 37665 0	C: 11226 1	I: 77624 1	C: 27412 0	I: 44345 0	C: 03663 1	C: 03661 0	C: 25517 0
32,2350	C: 03653 1	C: 01535 0	C: 25503 0	C: 03665 1	C: 35511 1	C: 27707 1	I: 45174 1	C: 00002 0
32,2360	C: 26662 1	I: 77624 1	C: 27421 0	I: 77776 1	04616 1	C: 50040 0	04645 1	55737 1
32,2370	05516 0	C: 01120 1	00004 0	34751 0	00006 1	02023 0	54001 1	44751 1

OCTAL LISTING FOR PARAGRAPH # 171, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

32,2400	70110 0	60001 0	54110 0	00003 1	04616 1	C: 53112 0	04616 1	C: 17706 0
32,2410	12543 0	00024 0	53105 0	52162 0	53101 1	53747 0	00006 1	20734 0
32,2420	52160 1	00032 0	54156 1	00006 1	30025 0	52155 1	00006 1	30036 1
32,2430	53107 1	00033 1	04616 1	C: 53114 0	04616 1	C: 17706 0	02537 1	00004 0
32,2440	00006 1	31331 1	53761 1	52162 0	53755 0	52160 1	53460 0	00006 1
32,2450	31107 0	53753 0	30156 0	55461 1	06042 1	C: 14025 0	C: 03747 0	I: 57261 0
32,2460	C: 21217 1	C: 24072 0	C: 03751 1	I: 47135 0	C: 01107 0	C: 21577 1	C: 03734 1	I: 47135 0
32,2470	C: 01110 0	C: 21577 1	C: 17736 0	C: 01101 0	I: 66405 0	C: 24004 0	C: 37757 0	C: 46041 0
32,2500	C: 17741 0	C: 00025 0	C: 34041 0	C: 51255 1	I: 77776 1	31457 0	54765 1	31460 1
32,2510	54767 0	31461 0	54771 1	06042 1	I: 45175 0	C: 01101 0	C: 47653 1	I: 77641 1
32,2520	C: 03741 0	I: 65552 0	C: 01745 1	I: 50025 0	C: 24547 1	C: 64522 1	I: 77776 1	34752 0
32,2530	54154 0	12535 1	I: 77776 1	34755 1	54154 0	31737 0	04640 1	30101 1
32,2540	74742 0	10000 0	12434 1	34753 1	54154 0	02535 0	C: 00210 1	C: 21042 1
32,2550	34753 1	55106 0	34756 1	10000 0	54002 1	11106 0	12564 0	00006 1
32,2560	50002 0	31761 0	50002 0	21101 1	00006 1	50002 0	31101 0	50002 0
32,2570	52156 1	11106 0	12600 1	00006 1	50002 0	31761 0	50002 0	20156 1
32,2600	10002 1	12553 1	52156 1	52155 1	32775 0	54120 0	04713 0	C: 01023 1
32,2610	07535 0	11106 0	12614 1	12630 1	00004 0	00006 1	30036 1	53767 1
32,2620	30033 1	54765 1	30034 0	54767 0	30032 0	54771 1	04616 1	C: 47617 1
32,2630	46250 1	04616 1	C: 47677 1	11106 0	12636 1	12703 0	00004 0	55106 0
32,2640	31766 1	05032 0	54166 1	41766 0	05032 1	54163 1	00006 1	70124 1
32,2650	52155 1	31767 0	05033 1	55766 0	00006 1	70166 1	00006 1	70122 1
32,2660	20155 1	31767 0	05032 0	55767 1	00006 1	70166 1	00006 1	70126 0
32,2670	20155 1	00006 1	30155 0	20155 1	10000 0	34736 1	12677 1	00006 1
32,2700	05012 1	00003 1	12552 0	31767 0	00006 1	70122 1	53107 1	41766 0
32,2710	00006 1	70126 0	21107 1	40163 1	00006 1	71766 0	00006 1	70122 1
32,2720	52155 1	30166 0	00006 1	70124 1	20155 1	40163 1	00006 1	71767 1
32,2730	00006 1	70126 0	20155 1	30154 1	00006 1	72776 1	57354 1	00006 1
32,2740	72776 1	55355 1	34757 1	00006 1	02032 0	00004 0	00006 1	12753 0
32,2750	04616 1	C: 52317 0	12771 0	44742 0	70110 0	54110 0	44752 1	00006 1
32,2760	03012 1	34743 0	26077 0	11055 1	44776 1	64777 1	05203 0	C: 03400 0
32,2770	C: 50067 0	44740 1	70076 1	54076 1	15155 1	C: 00052 0	C: 56655 1	05353 1

OCTAL LISTING FOR PARAGRAPH # 172, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD; "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

32,3000	C: 04024 0	04616 1	C: 11236 0	23254 1	55455 0	22000 0	55250 0	34751 0
32,3010	55515 0	44752 0	55346 0	34755 1	55623 0	44736 0	00006 1	03012 1
32,3020	06142 1	I: 43014 0	C: 02663 0	C: 03271 0	I: 43014 0	C: 05669 1	C: 03067 0	I: 43014 0
32,3030	C: 00266 0	C: 00270 1	I: 77201 1	C: 00001 0	C: 02023 1	I: 41525 0	C: 02401 0	C: 37625 1
32,3040	C: 55716 1	I: 64312 0	C: 01734 0	C: 37635 0	C: 71343 0	I: 45345 1	C: 02401 0	C: 25261 0
32,3050	C: 34041 0	C: 27061 1	I: 77331 0	C: 03647 1	C: 00050 1	C: 06522 1	C: 26575 1	C: 06520 0
32,3060	C: 26603 0	C: 06516 0	C: 16611 0	C: 25257 0	C: 27665 1	C: 06524 1	C: 17254 1	C: 06524 1
32,3070	C: 03643 0	I: 77745 1	C: 00015 0	C: 27561 0	C: 00017 1	I: 64312 0	C: 01734 0	C: 37521 0
32,3100	C: 67067 1	C: 35236 0	C: 62402 0	55646 0	06042 1	I: 57345 1	C: 03627 1	C: 02501 1
32,3110	I: 44232 1	C: 03633 1	I: 45325 1	C: 02477 1	C: 02632 0	I: 65222 0	C: 02631 1	I: 57216 1
32,3120	C: 02503 0	I: 65232 1	C: 02627 0	I: 57225 0	C: 02475 0	C: 02501 1	I: 51515 1	C: 03627 1
32,3130	I: 57225 0	C: 02473 0	C: 02505 0	I: 43215 0	I: 56215 1	I: 77661 0	C: 21613 0	I: 43206 1
32,3140	C: 03561 0	C: 14041 1	I: 45246 0	C: 25263 1	I: 45040 1	C: 65164 1	C: 27412 0	I: 43014 0
32,3150	C: 01473 0	C: 00063 1	I: 77745 1	C: 03561 0	C: 25517 0	C: 00017 1	C: 25535 0	C: 00025 0
32,3160	C: 25543 0	C: 27110 1	I: 77650 1	C: 65071 1	I: 54335 0	C: 03423 1	C: 20617 0	I: 77621 1
32,3170	C: 01041 1	C: 27442 0	C: 02527 1	I: 53435 0	C: 03521 1	I: 72441 0	C: 03635 1	C: 26617 0
32,3200	C: 03254 1	C: 02621 0	I: 77776 1	05353 1	C: 04024 0	44362 0	04616 1	C: 74670 0
32,3210	15155 1	06042 1	I: 47131 1	C: 02747 1	C: 65216 1	C: 31127 1	I: 53575 0	C: 02621 0
32,3220	C: 27773 1	C: 06522 1	C: 03765 0	I: 77776 1	25016 0	54003 0	00004 0	04674 0
32,3230	C: 40143 0	00003 1	04616 1	C: 54123 0	05353 1	C: 04024 0	24746 0	00006 1
32,3240	02033 0	00006 1	12250 1	33255 0	04616 1	C: 20624 0	16001 1	12236 1
32,3250	04616 1	C: 67713 1	04635 0	C: 74130 0	C: 02100 1	C: 00500 1	C: 00035 1	C: 30373 0
32,3260	C: 00004 0	C: 01610 1	C: 00000 1	C: 00010 0	37712 0	05105 0	C: 03304 0	C: 64067 1
32,3270	15261 0	I: 52375 1	C: 02511 0	C: 03627 1	I: 52141 1	C: 02517 0	C: 63164 1	05353 1
32,3300	C: 00003 1	34777 1	05173 1	C: 03264 1	00004 0	34755 1	57746 0	00006 1
32,3310	71756 0	21645 0	00016 1	30040 0	53764 1	52071 0	30041 1	57765 1
32,3320	56772 1	00006 1	30025 0	57762 1	31762 1	61157 0	54154 0	31764 0
32,3330	61160 1	54157 0	31765 1	61161 0	54161 0	41763 0	61253 1	60070 0
32,3340	55766 0	41764 1	61254 0	60071 1	55770 1	41765 0	61255 1	60072 1
32,3350	55772 0	34755 1	54155 1	54160 1	54162 0	55253 0	55254 1	55255 0
32,3360	44753 0	54163 1	05042 1	I: 65361 0	C: 26022 0	C: 03762 1	I: 77625 0	C: 01234 0
32,3370	C: 00037 0	I: 63271 0	C: 27112 0	C: 01226 1	I: 74251 1	C: 02621 0	I: 53352 0	C: 03527 1

OCTAL LISTING FOR PARAGRAPH # 174, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" DENCIES CAUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

33,2000	C: 41545 0	C: 42341 1	C: 61000 0	C: 71210 1	C: 00000 1	C: 00000 1	C: 72333 1	C: 45546 1
33,2010	C: 65363 1	C: 64451 0	C: 21241 0	C: 03216 1	C: 30152 0	C: 23101 0	C: 63105 0	C: 61732 1
33,2020	C: 11517 1	C: 01321 1	C: 26776 1	C: 00150 0	C: 33343 0	C: 02631 0	C: 25110 1	C: 24402 1
33,2030	C: 26013 0	C: 61377 0	C: 55754 1	C: 77644 1	C: 65556 1	C: 64453 1	C: 55670 0	C: 00002 0
33,2040	C: 11777 0	C: 01123 1	C: 37155 1	C: 00065 1	C: 06244 0	47110 0	74742 0	00006 1
33,2050	12123 1	00004 0	26110 0	44736 0	00006 1	03012 1	44740 1	70076 1
33,2060	54076 1	44753 0	70074 0	54074 0	04616 1	C: 52167 0	34740 0	70110 0
33,2070	10010 0	12124 1	35031 0	05072 1	C: 22113 0	C: 66067 0	44742 0	70110 0
33,2100	54110 0	34736 1	26110 0	12573 0	34752 1	05203 0	C: 03564 0	C: 52067 1
33,2110	34741 1	26110 0	12573 0	34753 1	05203 0	C: 02202 0	C: 52067 1	04616 1
33,2120	C: 17706 0	15155 1	15155 1	00006 1	41234 1	52155 1	00006 1	30025 0
33,2130	20155 1	54163 1	37155 0	00006 1	74740 1	52155 1	06042 1	I: 52315 1
33,2140	C: 01726 0	C: 03527 1	I: 74325 0	I: 52255 1	C: 01720 0	C: 03521 1	I: 77414 0	C: 01043 1
33,2150	C: 66152 1	12573 0	C: 25101 0	C: 00001 0	I: 77761 1	C: 26177 1	C: 01761 0	I: 77414 0
33,2160	C: 01263 1	40074 0	74753 0	00006 1	12573 0	00004 0	26074 0	11055 1
33,2170	44776 1	64777 1	05203 0	C: 03356 1	C: 50067 0	12573 0	C: 00006 1	C: 10000 0
33,2200	C: 75751 0	C: 41775 1	C: 00022 1	C: 07212 1	C: 00007 0	C: 16100 1	05353 1	C: 16035 0
33,2210	C: 20000 0	C: 02217 1	C: 66067 0	37721 1	55074 1	04616 1	C: 15271 1	06042 1
33,2220	I: 51575 1	C: 01325 0	I: 77776 1	30154 1	55245 1	00006 1	72020 0	53514 1
33,2230	00006 1	31244 1	53571 1	40104 0	74744 0	00006 1	12254 1	30106 0
33,2240	74737 1	10000 0	00006 1	32001 1	54052 1	00006 1	31514 0	00006 1
33,2250	10002 1	00006 1	71243 1	21571 1	32021 0	07312 0	52155 1	21510 0
33,2260	02440 0	04616 1	C: 47617 1	32414 1	04616 1	C: 20037 1	06042 1	I: 45014 0
33,2270	C: 03307 0	C: 66771 0	C: 66135 0	I: 77776 1	03514 1	02423 0	55157 1	55160 0
33,2300	55161 1	44741 0	70076 1	54076 1	34745 0	70103 1	10000 0	12342 1
33,2310	41102 0	74752 1	10000 0	12346 0	41250 0	61245 0	00006 1	62352 1
33,2320	40076 1	74741 0	26076 1	34753 1	55515 0	30106 0	74737 1	10000 0
33,2330	12375 0	34743 0	00006 1	02032 1	00006 1	12375 0	44736 0	70111 1
33,2340	54111 1	12410 0	44752 1	70102 0	54102 0	12375 0	40102 0	74752 1
33,2350	26102 0	12375 0	03514 1	11515 0	12366 1	10760 1	12400 0	05353 1
33,2360	C: 00374 1	37716 0	05072 1	C: 02575 1	C: 74067 0	12400 0	55570 0	03514 1
33,2370	31570 1	55515 0	00004 0	04674 0	C: 40166 1	40111 1	74736 0	26111 1

OCTAL LISTING FOR PARAGRAPH # 175, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES ALIGNED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

33,2400	00003 1	04616 1	C: 40463 1	20167 1	75004 1	54166 1	22007 0	52121 1
33,2410	03514 1	00676 1	31252 0	52006 0	C: 02145 0	I: 77624 1	C: 66667 0	I: 77776 1
33,2420	32437 0	02424 1	05155 0	36047 0	70004 0	77752 1	54061 1	00006 1
33,2430	50061 0	31545 1	50061 0	53220 1	10061 1	12425 1	00002 0	C: 00022 1
33,2440	31155 1	54765 1	31156 1	54767 0	31154 0	54771 1	00002 0	05353 1
33,2450	C: 00051 0	37723 0	05105 0	C: 03636 1	C: 66067 0	40107 0	75015 1	26107 0
33,2460	12546 0	I: 77776 1	40107 0	74735 0	00006 1	12551 0	40107 0	74743 1
33,2470	00006 1	12506 1	00006 1	33115 1	52155 1	00006 1	31535 0	20155 1
33,2500	10000 0	12505 1	05504 0	C: 00311 1	05504 0	C: 00253 0	40107 0	74742 0
33,2510	00006 1	12545 0	40107 0	74751 1	00006 1	13117 1	40107 0	74741 0
33,2520	00006 1	12540 0	31642 0	61427 1	00006 1	62536 0	34741 1	56003 1
33,2530	54001 1	41545 0	22003 1	61430 1	00006 1	62447 1	34746 0	12541 1
33,2540	34745 0	3676 0	13117 1	05567 0	C: 00511 1	00004 0	43113 0	70107 0
33,2550	54107 0	03514 1	30077 1	75014 0	10000 0	12567 0	30110 1	72250 0
33,2560	10000 0	12567 0	30110 1	77713 1	10000 0	12573 0	12045 0	00004 0
33,2570	44742 0	70110 0	54110 0	06042 1	I: 51575 1	C: 03573 0	I: 45206 1	C: 02332 0
33,2600	C: 03535 1	C: 03775 1	I: 47075 0	C: 26026 1	C: 21613 0	C: 27742 0	C: 03537 0	I: 53435 0
33,2610	C: 03720 1	C: 27726 1	C: 03573 0	I: 60505 1	C: 01734 0	C: 27545 0	C: 03601 0	I: 76505 0
33,2620	C: 01734 0	C: 27553 1	C: 03537 0	I: 51435 1	C: 03601 0	I: 63552 0	I: 77671 1	I: 47075 0
33,2630	C: 26030 0	C: 21613 0	I: 77776 1	00004 0	21526 0	55743 1	31540 1	55744 0
33,2640	31542 0	55745 1	30154 1	55716 1	00006 1	31573 1	53521 1	00006 1
33,2650	31575 1	53523 0	00006 1	31577 0	53525 0	00006 1	31601 1	53527 1
33,2660	00006 1	31603 0	53531 0	00006 1	31605 0	53533 1	12275 1	I: 41456 0
33,2670	C: 03537 0	I: 67340 1	C: 02777 1	C: 02600 1	I: 50076 0	C: 66724 0	I: 50375 0	C: 06516 0
33,2700	C: 03537 0	I: 41552 0	I: 44316 0	C: 26766 1	I: 56325 0	C: 26040 1	C: 00043 0	C: 00041 1
33,2710	I: 41205 0	C: 26042 0	I: 65361 0	C: 03537 0	I: 41205 0	C: 26044 0	C: 00041 1	I: 76561 1
33,2720	C: 06516 0	I: 45455 1	C: 74256 0	I: 41455 0	I: 60345 0	C: 00043 0	C: 00050 1	I: 53663 1
33,2730	C: 26032 1	C: 56623 0	I: 45561 1	C: 74214 0	I: 77616 0	I: 61275 1	C: 00325 0	C: 01734 0
33,2740	I: 76561 1	C: 26022 0	C: 03527 1	I: 41562 0	I: 41455 0	C: 01236 1	I: 65255 0	C: 01226 0
33,2750	C: 01247 1	I: 74261 1	C: 20207 0	I: 44055 1	C: 01220 0	C: 00037 0	C: 37545 1	C: 66667 0
33,2760	I: 53255 0	I: 77655 1	C: 01226 0	C: 37553 0	C: 00037 0	C: 01463 1	C: 06215 0	C: 00010 0
33,2770	C: 00000 1	I: 41575 0	C: 02317 0	I: 65255 1	C: 01726 0	C: 01247 1	I: 74271 0	C: 26770 0

OCTAL LISTING FOR PARAGRAPH # 176, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "1" DENOTES UNLSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

33,3000	I: 77655 1	C: 01720 0	C: 37573 1	C: 67067 1	I: 53255 0	C: 01726 0	I: 77626 0	C: 74176 1
33,3010	I: 77776 1	03514 1	06042 1	I: 77775 1	C: 03563 1	C: 26217 0	C: 02573 0	C: 25720 0
33,3020	C: 03601 0	C: 01726 0	I: 77776 1	03514 1	06042 1	I: 74375 1	C: 00325 0	C: 26024 0
33,3030	I: 53206 0	C: 01236 1	I: 53206 0	C: 03527 1	I: 56325 0	C: 01247 1	C: 26770 0	I: 77761 1
33,3040	I: 77655 1	C: 03521 1	C: 37573 1	C: 67067 1	I: 53255 0	I: 77655 1	C: 03527 1	C: 03601 0
33,3050	I: 77646 0	C: 27472 0	C: 03537 0	I: 72441 0	C: 03601 0	C: 27474 0	C: 03573 0	I: 72435 0
33,3060	C: 02325 1	C: 17734 1	C: 00045 0	I: 77625 0	C: 02333 0	C: 37525 0	C: 66461 1	I: 77656 1
33,3070	C: 17537 0	C: 00043 0	I: 55261 1	C: 20257 0	C: 26036 1	I: 74205 0	C: 26770 0	C: 03537 0
33,3100	C: 03563 1	I: 77616 0	C: 00303 1	C: 00005 1	C: 33212 0	C: 00014 1	C: 20000 0	C: 00000 1
33,3110	C: 00310 0	C: 00000 0	C: 00620 0	C: 00110 1	C: 37767 0	C: 02200 1	C: 04445 0	34742 1
33,3120	70107 0	10000 0	12545 0	34750 1	70107 0	00006 1	13252 0	30120 1
33,3130	54166 1	06042 1	I: 61375 1	C: 02273 0	C: 02146 0	I: 72515 0	C: 03601 0	I: 50255 0
33,3140	C: 03734 1	C: 00001 0	I: 77405 0	C: 01352 1	40110 0	74743 1	00006 1	13152 0
33,3150	31353 0	07312 0	06042 1	I: 54215 0	C: 03655 1	C: 20210 0	I: 74205 0	C: 26011 0
33,3160	I: 45241 1	C: 03537 0	C: 03535 1	C: 03665 1	I: 77776 1	30107 1	74741 0	00006 1
33,3170	13205 1	06042 1	I: 45246 0	C: 02521 0	I: 45252 0	C: 03535 1	I: 77776 1	25670 1
33,3200	06726 1	13522 0	13522 0	05516 0	C: 00263 0	40107 0	74744 0	10000 0
33,3210	12252 0	06042 1	I: 40545 1	C: 03535 1	I: 77776 1	00006 1	31665 0	52155 1
33,3220	07547 0	00006 1	13224 1	13252 0	54156 1	40001 1	61420 0	00006 1
33,3230	63252 1	00006 1	71421 0	00006 1	11420 1	54135 1	07316 1	06042 1
33,3240	I: 77752 1	I: 53361 0	C: 03537 0	C: 03573 0	C: 37657 1	C: 67067 1	I: 77776 1	03514 1
33,3250	34755 1	03476 1	03514 1	40107 0	74745 1	10000 0	13456 1	41651 0
33,3260	54001 1	26001 1	60001 0	40001 0	50120 1	52047 0	34741 1	54003 0
33,3270	31655 0	54765 1	31656 0	54767 0	31654 1	54771 1	04616 1	C: 47617 1
33,3300	30120 1	54166 1	06042 1	I: 45173 0	C: 02231 0	C: 47675 0	I: 54325 1	C: 03653 1
33,3310	C: 20215 0	I: 41403 0	C: 51764 0	I: 77776 1	44753 0	54163 1	31657 1	22007 0
33,3320	52155 1	31665 0	22007 0	52160 1	31661 1	22007 0	52162 0	35016 0
33,3330	54003 0	06042 1	I: 65361 0	C: 26022 0	C: 02253 1	I: 56225 1	C: 01234 0	C: 27110 1
33,3340	I: 76561 1	C: 01236 1	I: 53255 0	C: 03527 1	I: 53352 0	C: 03734 1	I: 51406 1	I: 43202 0
33,3350	C: 27104 1	C: 24025 0	I: 44241 0	C: 00001 0	I: 51406 1	I: 77425 1	C: 00025 0	25672 0
33,3360	06726 1	13537 1	13537 1	05516 0	C: 00262 1	30107 1	74740 1	00006 1
33,3370	13377 1	05516 0	C: 00250 0	31651 1	67751 0	00006 1	13456 1	40107 0

OCTAL LISTING FOR PARAGRAPH # 200, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "@" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

34,2000	I: 71220 1	C: 03632 0	C: 03442 0	C: 24041 0	C: 27060 1	I: 67175 0	C: 00001 0	C: 02777 1
34,2010	C: 03642 1	I: 57456 1	C: 27656 1	C: 00007 0	C: 03650 1	I: 53435 0	C: 03642 1	I: 66001 0
34,2020	C: 00001 0	C: 02776 0	I: 47206 0	C: 03656 1	I: 63372 1	I: 63315 0	C: 03656 1	C: 03434 1
34,2030	I: 76575 0	C: 00001 0	C: 03656 1	I: 77646 0	C: 27664 0	C: 03642 1	I: 53315 0	C: 03650 1
34,2040	C: 03656 1	I: 77624 1	C: 46341 0	I: 77624 1	C: 46451 0	I: 77624 1	C: 45636 0	C: 16321 0
34,2050	C: 00015 1	I: 77624 1	C: 46451 0	I: 77624 1	C: 45636 0	C: 36317 1	C: 03632 0	C: 00000 1
34,2060	C: 03020 0	C: 03020 0	C: 34661 1	C: 00606 1	C: 04467 0	C: 00601 0	C: 33216 1	C: 10000 0
34,2070	C: 00000 1	C: 00000 1	C: 00001 0	C: 00004 0	C: 31566 0	C: 00000 1	C: 01177 1	C: 00002 0
34,2100	C: 27311 1	C: 77754 1	C: 57611 1	C: 00000 1	C: 12326 0	C: 00116 1	C: 00730 0	C: 00000 1
34,2110	C: 03643 0	C: 03020 1	C: 25140 0	I: 43014 0	C: 03260 0	C: 03061 0	I: 43014 0	C: 03262 1
34,2120	C: 03062 1	I: 77745 1	C: 32425 0	C: 03606 1	C: 03614 1	I: 77201 1	C: 00001 0	C: 02303 0
34,2130	I: 41446 1	I: 70501 1	C: 30050 1	I: 51515 1	C: 03552 0	I: 55301 0	C: 00047 1	I: 53664 0
34,2140	C: 00046 0	C: 57175 0	I: 41215 1	C: 30070 0	I: 65301 0	C: 00047 1	C: 02321 0	I: 56342 1
34,2150	I: 75457 0	C: 20172 1	I: 53515 0	C: 02303 0	I: 47315 0	C: 02261 0	I: 77656 1	I: 72441 0
34,2160	C: 03472 0	I: 45421 1	C: 60203 0	C: 30062 0	C: 03612 1	I: 43345 1	C: 03606 1	C: 30072 1
34,2170	C: 03606 1	I: 77025 0	C: 30060 1	C: 00006 1	I: 77644 1	C: 70776 0	I: 77601 0	C: 00001 0
34,2200	I: 51545 1	C: 03574 1	I: 50025 0	C: 20064 0	C: 70224 1	I: 43174 1	C: 00007 0	C: 03300 1
34,2210	C: 70776 0	I: 43014 0	C: 03342 1	C: 70216 0	C: 03303 1	C: 70776 0	I: 71214 0	C: 03060 1
34,2220	C: 30066 1	I: 77765 0	C: 03574 1	C: 03574 1	I: 41575 0	C: 02303 0	I: 63256 0	C: 02261 0
34,2230	I: 53435 0	I: 76561 1	C: 03574 1	C: 02267 0	I: 40055 0	C: 03472 0	C: 70237 0	C: 37566 0
34,2240	C: 46441 1	C: 26744 1	I: 77614 1	C: 03466 0	C: 26655 0	C: 32421 1	C: 36730 0	C: 24732 1
34,2250	I: 72142 0	C: 02776 0	C: 27604 1	C: 46351 1	I: 77624 1	C: 46451 0	C: 17602 0	C: 03621 1
34,2260	I: 52054 1	C: 70263 1	C: 70372 0	I: 77745 1	C: 02752 0	I: 50025 0	C: 30110 1	C: 70372 0
34,2270	I: 45145 0	C: 03041 1	C: 46451 0	I: 60201 1	C: 30003 1	C: 00047 1	I: 50315 0	C: 02303 0
34,2300	C: 03566 1	I: 56246 1	C: 00003 1	I: 45257 0	C: 20201 0	C: 30100 0	I: 71240 1	C: 70372 0
34,2310	C: 02740 0	I: 45312 0	C: 30070 0	C: 14017 1	C: 02317 0	I: 56342 1	I: 41325 0	C: 02740 0
34,2320	C: 00041 1	I: 77624 1	C: 46451 0	I: 72412 0	I: 41366 1	I: 52414 1	C: 04343 1	C: 70330 0
34,2330	I: 50315 0	C: 02303 0	C: 03566 1	C: 03617 1	I: 77646 0	I: 41301 0	C: 00050 1	I: 53660 1
34,2340	C: 00047 1	C: 20204 0	C: 14015 0	C: 32425 0	C: 00021 1	I: 53575 0	C: 00015 0	C: 26730 1
34,2350	C: 02303 0	I: 75315 1	C: 03566 1	C: 03617 1	I: 45076 1	C: 46441 1	C: 26744 1	I: 77614 1
34,2360	C: 03466 0	C: 36655 1	C: 24732 1	I: 51125 0	C: 03617 1	C: 70376 1	I: 45345 1	C: 03604 0
34,2370	I: 52006 0	C: 70376 1	I: 71201 1	C: 00001 0	C: 32425 0	I: 77606 1	I: 41345 0	C: 03467 1

OCTAL LISTING FOR PARAGRAPH # 201, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

34,2400	C: 03604 0	I: 45281 0	C: 20217 1	I: 77815 0	C: 03634 0	C: 01777 1	I: 77021 1	C: 03636 1
34,2410	C: 00005 1	I: 40240 0	C: 70776 0	C: 00001 0	I: 63375 0	C: 03566 1	C: 02303 0	I: 77624 1
34,2420	C: 71062 0	C: 26311 0	C: 00007 0	C: 27514 1	C: 03506 1	I: 63201 1	C: 00001 0	C: 03500 1
34,2430	I: 77624 1	C: 71062 0	C: 27522 1	C: 00007 0	C: 37520 0	C: 71133 0	I: 40375 1	C: 02311 0
34,2440	C: 00001 0	I: 45115 0	C: 03544 1	C: 46341 0	I: 77624 1	C: 46451 0	C: 27604 0	C: 03544 1
34,2450	I: 63201 1	C: 00001 0	C: 02311 0	I: 65325 0	C: 01777 1	C: 03636 1	I: 41525 0	C: 33641 0
34,2460	I: 77624 1	C: 73376 1	I: 77624 1	C: 46425 0	I: 77745 1	C: 02257 0	I: 73401 0	C: 00007 0
34,2470	I: 53515 0	C: 03536 1	C: 00001 0	I: 47315 0	C: 02261 0	I: 77656 1	I: 71525 0	C: 02257 0
34,2500	I: 45561 1	C: 77754 1	I: 74345 0	I: 76455 1	C: 00023 0	I: 50206 0	C: 03536 1	I: 41552 0
34,2510	I: 72316 0	C: 00155 0	I: 50315 0	C: 03536 1	C: 03536 1	I: 57551 1	C: 00155 0	I: 50315 0
34,2520	C: 03552 0	C: 03552 0	I: 76371 0	I: 71244 0	C: 70542 0	C: 03606 1	I: 77025 0	C: 30072 1
34,2530	C: 00001 0	I: 77654 0	C: 72143 0	I: 70545 1	C: 03612 1	C: 03612 1	I: 77621 1	C: 03576 0
34,2540	C: 37574 0	C: 70165 1	I: 41566 1	I: 45276 0	C: 00007 0	C: 14013 0	I: 45425 0	C: 77762 1
34,2550	I: 77646 0	C: 14017 1	C: 00013 0	I: 45246 0	C: 00017 1	I: 71240 1	C: 70561 1	C: 00015 0
34,2560	C: 00013 0	I: 77745 1	C: 00013 0	I: 76561 1	I: 53455 0	C: 03536 1	I: 53515 0	C: 03552 0
34,2570	I: 53515 0	C: 03560 1	I: 63235 0	C: 00007 0	C: 00007 0	I: 50235 0	C: 00001 0	I: 77626 0
34,2600	C: 53762 1	I: 72441 0	I: 75326 1	C: 00015 0	I: 41542 1	I: 71214 0	C: 03301 0	C: 70644 0
34,2610	C: 00001 0	I: 65225 1	C: 03610 0	C: 03574 1	I: 60225 1	C: 03576 0	C: 00047 1	I: 65265 0
34,2620	C: 00013 1	C: 03574 1	C: 03576 0	I: 43014 0	C: 03342 1	C: 70656 0	C: 03343 0	C: 70656 0
34,2630	I: 41345 0	C: 00013 1	C: 03610 0	I: 71244 0	C: 70662 0	C: 30062 0	I: 77765 0	C: 03612 1
34,2640	C: 03612 1	I: 43014 0	C: 03062 0	C: 03263 0	I: 77745 1	C: 00001 0	C: 17610 0	C: 03574 1
34,2650	C: 03576 0	I: 43025 1	C: 03612 1	C: 03261 1	C: 37574 0	C: 70165 1	I: 43014 0	C: 03302 0
34,2660	C: 70702 0	C: 03303 1	C: 70702 0	I: 75345 1	C: 30102 1	C: 00005 1	I: 77765 0	C: 03610 0
34,2670	C: 03612 1	I: 43276 0	C: 03574 1	C: 17574 1	C: 00001 0	I: 43014 0	C: 03063 1	C: 03062 0
34,2700	C: 37610 1	C: 70176 0	I: 61345 0	C: 00005 1	C: 00050 1	I: 54065 0	C: 00001 0	C: 00047 1
34,2710	I: 77657 0	C: 20601 1	C: 17612 1	C: 00001 0	C: 03610 0	I: 51545 1	C: 03612 1	I: 45206 1
34,2720	C: 30176 0	I: 71240 1	C: 70737 0	I: 50025 0	C: 30106 0	C: 70732 0	I: 75345 1	C: 30106 0
34,2730	C: 03612 1	C: 03612 1	I: 45345 1	C: 03574 1	C: 03612 1	C: 37574 0	C: 70165 1	I: 77145 1
34,2740	C: 03612 0	C: 30002 1	I: 77750 0	C: 02776 0	I: 50023 0	C: 30072 1	C: 70776 0	I: 71374 1
34,2750	C: 00003 1	C: 03604 0	I: 50023 0	C: 30072 1	C: 70776 0	I: 45345 1	C: 01777 1	C: 03634 0
34,2760	C: 02253 1	I: 45374 0	C: 00004 0	C: 30112 0	I: 77040 0	C: 70776 0	C: 00005 1	I: 45245 1
34,2770	C: 03636 1	C: 01777 1	C: 02255 1	I: 51025 1	C: 30112 0	C: 72157 1	I: 43014 0	C: 03302 0

OCTAL LISTING FOR PARAGRAPH # 202, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

34,3000	C: 72045 0	C: 03343 0	C: 72045 0	I: 71334 0	C: 03613 0	C: 32425 0	I: 43014 0	C: 03260 0
34,3010	C: 03061 0	I: 43014 1	C: 03262 1	C: 03263 0	C: 37606 0	C: 70125 0	I: 71220 1	C: 03470 1
34,3020	C: 03442 0	C: 34041 0	C: 46403 1	I: 77214 0	C: 01067 1	C: 03560 1	C: 03530 1	C: 27566 1
34,3030	C: 03552 0	C: 03522 1	C: 03500 1	I: 47256 0	C: 03506 1	I: 77656 1	C: 26261 0	C: 03536 1
34,3040	C: 37642 0	C: 71052 0	C: 02311 0	C: 26303 0	C: 03544 1	C: 37650 0	C: 71052 0	C: 03514 1
34,3050	C: 37472 1	C: 03470 1	I: 41406 0	I: 74241 0	C: 02261 0	C: 02261 0	I: 51352 1	I: 63256 0
34,3060	I: 74246 1	I: 43572 0	I: 65325 0	C: 03634 0	C: 01777 1	I: 41525 0	C: 33641 1	I: 77650 1
34,3070	C: 73376 1	I: 65325 0	C: 01777 1	C: 03636 1	I: 41525 0	C: 32425 0	I: 77650 1	C: 72276 1
34,3100	I: 76020 1	C: 03470 1	C: 01521 0	I: 77624 1	C: 72375 0	I: 77624 1	C: 71120 1	I: 61375 1
34,3110	C: 03434 1	C: 00001 1	I: 77772 0	C: 03656 1	I: 51406 1	C: 27664 0	I: 77650 1	C: 03470 1
34,3120	I: 77201 1	C: 00007 0	C: 02261 0	I: 63276 1	C: 02303 0	I: 57456 1	I: 47206 0	C: 02261 0
34,3130	I: 77772 0	C: 00001 0	I: 77616 0	I: 77220 1	C: 03470 1	C: 02311 0	I: 53406 0	C: 27544 1
34,3140	C: 03522 1	I: 50256 0	C: 03544 1	I: 72406 0	C: 16732 0	I: 65316 0	C: 06514 1	I: 45302 1
34,3150	I: 72566 1	I: 57515 1	I: 77625 1	C: 03522 1	I: 65241 0	C: 02261 0	I: 45565 0	C: 51047 0
34,3160	C: 03522 1	I: 45115 0	C: 03530 1	C: 46441 1	C: 26744 1	I: 77614 1	C: 03666 1	C: 36655 1
34,3170	C: 24732 1	I: 53754 1	C: 02777 1	C: 57576 1	C: 00023 0	I: 76441 1	C: 03544 1	I: 51515 1
34,3200	I: 63257 1	C: 57576 1	C: 02311 0	I: 65246 1	I: 77625 0	C: 00003 1	C: 17600 1	C: 02742 1
34,3210	I: 65301 0	C: 00047 1	C: 00041 1	I: 77624 1	C: 46451 0	I: 56262 0	I: 41457 1	C: 20174 1
34,3220	I: 65225 1	C: 03600 1	I: 56302 0	C: 00035 1	I: 75406 1	I: 41275 1	C: 00007 0	C: 00001 0
34,3230	I: 65272 0	C: 00003 1	I: 65301 0	C: 00047 1	C: 02321 0	I: 56342 1	I: 65257 1	C: 20174 1
34,3240	C: 00005 1	I: 65301 0	C: 00050 1	C: 02321 0	I: 56342 1	I: 44257 1	C: 57604 1	I: 63525 0
34,3250	C: 00011 1	I: 75421 1	I: 47315 0	C: 02261 0	C: 03544 1	I: 74256 0	C: 00013 0	I: 74315 0
34,3260	C: 03544 1	C: 00011 1	I: 76455 1	I: 77626 0	C: 74233 0	I: 77651 0	C: 03514 1	C: 36275 1
34,3270	C: 03470 1	05353 1	C: 04024 0	00004 0	04616 1	C: 40154 0	06042 1	I: 77614 1
34,3300	C: 06460 0	I: 43014 1	C: 04067 1	C: 04666 0	I: 77214 0	C: 05062 0	C: 01220 0	C: 16032 1
34,3310	C: 01234 0	I: 45014 0	C: 01463 1	C: 26351 1	I: 77201 1	C: 00001 0	C: 01220 0	I: 65352 0
34,3320	C: 01234 0	I: 45006 0	C: 51677 0	C: 02023 1	I: 77776 1	33342 1	04616 1	C: 20477 1
34,3330	16001 1	13333 0	13325 1	06042 1	I: 77775 1	C: 06522 1	C: 36231 1	C: 33471 0
34,3340	I: 77776 1	16001 1	C: 01453 1	I: 40220 0	C: 01163 1	C: 00001 0	I: 41575 0	C: 06516 0
34,3350	I: 41434 1	C: 21574 1	I: 77624 1	C: 55716 1	I: 74321 1	C: 01734 0	C: 16027 0	C: 26325 1
34,3360	C: 02023 1	I: 52446 0	C: 36333 1	C: 01163 1	C: 00046 0	C: 07274 0	C: 04145 0	C: 15527 0
34,3370	C: 00007 0	C: 23346 1	25353 1	C: 00035 1	06042 1	I: 77614 1	C: 04765 1	C: 60315 0

OCTAL LISTING FOR PARAGRAPH # 214, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

35,2000	05504 0	C: 00027 1	05504 0	C: 00031 0	32032 1	03621 1	33626 1	03621 1
35,2010	05516 0	C: 00027 1	06042 1	I: 77624 1	C: 70060 0	I: 43014 0	C: 00470 1	C: 01067 1
35,2020	I: 77776 1	32033 0	03621 1	06042 1	I: 77614 1	C: 01071 0	I: 77624 1	C: 73515 1
35,2030	I: 77650 1	C: 72026 0	C: 01441 1	C: 01452 0	02354 1	02027 1	02361 1	00006 1
35,2040	32425 0	03621 1	02060 0	I: 77734 1	C: 03613 0	I: 77740 1	C: 03613 0	I: 77533 1
35,2050	C: 32430 1	00154 1	05734 1	35006 1	04616 1	C: 20477 1	06001 0	02053 0
35,2060	02366 0	32424 1	55467 1	55633 1	55634 0	32415 0	03621 1	06042 1
35,2070	I: 57545 1	C: 03634 0	I: 71240 1	C: 72120 1	C: 01643 1	C: 34041 0	C: 46403 1	I: 53775 1
35,2100	C: 03536 1	C: 57176 0	C: 26655 0	C: 03544 1	I: 43057 1	C: 57176 0	C: 03466 0	C: 16744 1
35,2110	C: 06532 0	C: 36756 0	C: 25557 1	I: 77615 0	C: 03574 1	C: 03634 0	I: 77776 1	02065 0
35,2120	I: 77776 1	03622 1	04616 1	C: 20477 1	06001 0	02127 1	02121 1	33632 0
35,2130	03621 1	06042 1	I: 77745 1	C: 03624 0	C: 37442 1	C: 20000 0	I: 77624 1	C: 71016 0
35,2140	I: 77201 1	C: 00001 0	C: 03506 1	I: 65315 0	C: 03500 1	C: 02634 0	I: 65325 0	C: 03636 1
35,2150	C: 33641 1	I: 45016 0	C: 73376 1	I: 77624 1	C: 46435 1	I: 77624 1	C: 70113 0	I: 43014 0
35,2160	C: 01311 0	C: 72163 0	C: 00470 1	I: 77745 1	C: 02253 1	C: 02253 1	I: 51025 1	C: 32427 1
35,2170	C: 72165 0	I: 77745 1	C: 02255 1	C: 02255 1	I: 51025 1	C: 32427 1	C: 72173 1	I: 77776 1
35,2200	32417 1	03621 1	06042 1	I: 45175 0	C: 02267 0	C: 71100 0	C: 26267 0	C: 02311 0
35,2210	C: 26303 0	C: 02275 0	I: 45170 0	C: 01522 0	C: 72375 0	I: 77745 1	C: 03636 1	C: 37640 1
35,2220	C: 73515 1	I: 77650 1	C: 72136 0	02354 1	02226 0	02361 1	02366 0	32416 0
35,2230	03621 1	06042 1	I: 77745 1	C: 03640 0	C: 17636 1	C: 01777 1	C: 37442 1	C: 20000 0
35,2240	I: 77624 1	C: 71016 0	I: 77624 1	C: 71133 0	I: 77201 1	C: 00001 0	C: 03544 1	I: 45115 0
35,2250	C: 02311 0	C: 71071 1	I: 77624 1	C: 46425 0	I: 77201 1	C: 00001 0	C: 03530 1	I: 45115 0
35,2260	C: 03522 1	C: 71071 1	I: 77624 1	C: 46425 1	I: 43145 0	C: 32425 0	C: 03460 0	C: 36217 1
35,2270	C: 72674 1	I: 77454 1	C: 72307 0	05567 0	C: 00611 1	35006 1	04616 1	C: 20477 1
35,2300	06001 0	02303 0	02226 0	06042 1	I: 77745 1	C: 32425 0	C: 02317 0	I: 43014 0
35,2310	C: 01311 0	C: 72313 0	C: 00470 1	I: 43345 1	C: 02317 0	C: 03636 1	C: 03636 1	I: 77625 0
35,2320	C: 01777 1	I: 51025 1	C: 32427 1	C: 72321 1	I: 77615 0	C: 32427 1	C: 16253 1	C: 03636 1
35,2330	I: 41425 1	C: 03640 0	I: 45246 0	C: 32427 1	I: 43244 1	C: 72322 0	C: 32427 1	I: 45565 0
35,2340	C: 75522 0	I: 77776 1	32417 1	03621 1	06042 1	I: 45175 0	C: 02275 0	C: 71100 0
35,2350	C: 36275 1	C: 73515 1	I: 77650 1	C: 72240 1	00006 1	23470 0	05504 0	C: 00050 1
35,2360	01470 0	00006 1	23470 0	05516 0	C: 00050 1	01470 0	00006 1	23470 0
35,2370	05504 0	C: 00027 1	05504 0	C: 00031 0	01470 0	C: 03434 1	I: 45020 1	C: 03463 0

OCTAL LISTING FOR PARAGRAPH # 205, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "2" CENCES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

35,2400	C: 71120 1	I: 64375 1	C: 03434 1	C: 00001 0	I: 66172 0	C: 03615 1	C: 03434 1	I: 77776 1
35,2410	31615 1	13621 1	06742 1	I: 77650 1	C: 03463 0	C: 01413 0	C: 01415 0	C: 01513 1
35,2420	C: 77776 1	C: 62467 1	C: 17777 0	C: 37776 0	C: 00000 1	C: 00000 1	C: 00025 0	C: 37100 1
35,2430	C: 00600 1	C: 00601 0	C: 00602 0	C: 00603 1	C: 00604 0	C: 00605 1	C: 00606 1	00006 1
35,2440	23465 1	34755 1	55162 1	34752 0	00004 0	05203 0	C: 02723 0	C: 74067 0
35,2450	05327 1	C: 40036 0	C: 05024 1	C: 13000 0	01465 1	02354 1	02460 1	02361 1
35,2460	02366 0	33632 1	03621 1	00006 1	33655 1	53621 1	32424 1	55466 0
35,2470	03603 1	06742 1	I: 71214 0	C: 01270 0	C: 03636 1	C: 17442 0	C: 02257 0	I: 43054 1
35,2500	C: 72502 0	C: 31070 1	I: 77624 1	C: 20000 0	I: 43145 0	C: 06524 1	C: 03460 0	I: 43014 0
35,2510	C: 01310 1	C: 72513 0	C: 03660 1	C: 02317 0	I: 43345 1	C: 03636 1	C: 02317 0	C: 34041 0
35,2520	C: 46403 1	I: 77624 1	C: 72674 1	I: 77454 1	C: 72535 1	05567 0	C: 00611 1	35006 1
35,2530	04616 1	C: 20477 1	06001 0	02460 1	02525 1	I: 43014 0	C: 03600 1	C: 72514 1
35,2540	C: 01310 1	C: 72545 0	I: 77776 1	03603 1	02550 0	I: 77776 1	33632 0	03621 1
35,2550	06742 1	I: 712 1 1	C: 00001 0	C: 02777 1	C: 14047 1	C: 03621 1	I: 71406 0	C: 16732 0
35,2560	I: 77756 0	C: 26720 1	C: 03552 0	I: 77657 0	C: 57176 0	C: 26655 0	C: 03560 1	I: 43057 1
35,2570	C: 57176 0	C: 03466 0	C: 36744 0	C: 24732 1	I: 77745 1	C: 03636 1	C: 03610 0	I: 77015 0
35,2600	C: 00037 0	C: 37621 1	C: 73216 0	I: 51575 1	C: 02366 0	C: 27576 0	C: 03506 1	I: 51451 0
35,2610	C: 03566 1	C: 26350 0	C: 03536 1	I: 45115 0	C: 02327 1	C: 46341 0	I: 77624 1	C: 46451 0
35,2620	C: 17606 1	C: 03626 1	C: 03442 0	I: 77776 1	33634 0	03621 1	06042 1	I: 77624 1
35,2630	C: 73432 0	I: 77624 1	C: 73515 1	I: 77650 1	C: 72504 0	02354 1	00006 1	31401 0
35,2640	02644 0	02361 1	00006 1	31402 1	53576 0	02366 0	06042 1	I: 77624 1
35,2650	C: 20000 0	I: 77634 0	C: 21574 1	C: 03612 1	I: 77615 0	C: 03576 0	C: 03442 0	C: 03610 0
35,2660	C: 34041 0	C: 46403 1	I: 77624 1	C: 73204 0	I: 77624 1	C: 73216 0	I: 77624 1	C: 73432 0
35,2670	I: 77624 1	C: 73515 1	I: 77650 1	C: 72651 0	I: 66220 1	C: 03463 0	C: 03614 1	C: 40000 0
35,2700	I: 40345 1	C: 33643 0	C: 00001 0	C: 27574 1	C: 03536 1	C: 27500 1	C: 03544 1	C: 27506 1
35,2710	C: 03552 0	C: 27522 1	C: 03560 1	C: 03530 1	I: 77624 1	C: 73204 0	I: 63235 0	C: 03536 1
35,2720	I: 53515 0	C: 03526 1	I: 46315 1	I: 51352 1	C: 02311 0	I: 63256 0	I: 63241 0	C: 00001 0
35,2730	I: 75241 1	C: 02311 0	I: 65552 0	I: 50315 0	C: 02311 0	C: 03536 1	I: 71244 0	C: 72742 0
35,2740	C: 06532 0	I: 41425 1	I: 71214 0	C: 03740 1	C: 73171 1	C: 02576 0	C: 14032 1	I: 77625 0
35,2750	C: 02257 0	C: 03576 0	I: 45246 0	C: 23647 1	I: 77640 0	C: 73201 0	I: 70525 0	C: 03614 1
35,2760	I: 72030 1	C: 03463 0	C: 00154 1	I: 77330 1	C: 03612 0	C: 03552 0	I: 65256 0	C: 00045 0
35,2770	I: 53515 0	C: 33626 1	I: 77725 1	I: 41525 0	C: 00045 0	I: 77621 1	C: 00015 0	C: 14037 0

OCTAL LISTING FOR PARAGRAPH # 276, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

35,3000	C: 06522 1	I: 41425 1	C: 02257 0	I: 50165 0	C: 00037 0	C: 02463 0	I: 71545 0	I: 56205 0
35,3010	C: 00017 1	C: 00115 0	I: 77676 0	C: 00035 1	I: 44246 1	C: 06522 1	I: 77240 1	C: 03463 0
35,3020	C: 02261 0	I: 53435 0	C: 00007 0	I: 41241 0	C: 03544 1	C: 00015 0	I: 47315 0	C: 00001 0
35,3030	C: 03560 1	I: 53435 0	C: 00001 0	I: 41241 0	C: 03560 1	C: 00017 1	I: 77621 1	I: 63301 0
35,3040	C: 00047 1	C: 00007 0	I: 50235 0	C: 00001 0	C: 02261 0	I: 50315 0	C: 00001 0	C: 00007 0
35,3050	I: 65552 0	I: 77765 0	I: 43225 0	C: 06522 1	C: 02257 0	I: 65525 0	C: 00035 1	I: 75221 1
35,3060	C: 06522 1	C: 00037 0	I: 77615 0	I: 56205 0	C: 03641 1	I: 77605 1	I: 41257 1	C: 20176 0
35,3070	I: 51406 1	I: 50025 0	C: 03574 1	C: 73077 0	I: 75345 1	C: 02574 1	I: 77606 1	I: 51135 1
35,3100	C: 03614 1	C: 73107 0	I: 71331 0	C: 03614 1	C: 37777 1	I: 77650 1	C: 73145 0	I: 41345 0
35,3110	C: 03576 0	C: 00033 1	I: 71244 1	C: 73123 0	C: 03574 1	I: 77605 1	C: 03645 0	C: 17574 1
35,3120	I: 70446 0	I: 52076 1	C: 73133 1	I: 51545 1	C: 03576 0	I: 51525 1	C: 00033 1	I: 77625 0
35,3130	I: 71240 1	C: 73126 1	I: 77646 0	I: 52165 1	C: 03606 1	C: 73145 0	I: 57545 1	C: 03606 1
35,3140	I: 70406 1	C: 03606 1	I: 77615 0	I: 77650 1	C: 73146 0	C: 02606 1	I: 77615 0	C: 02317 0
35,3150	C: 02317 0	I: 63375 0	C: 03506 1	C: 03500 1	I: 77624 1	C: 72372 0	I: 77624 1	C: 46425 0
35,3160	I: 63375 0	C: 03531 1	C: 02522 1	I: 77624 1	C: 73372 0	I: 77624 1	C: 46435 1	I: 77650 1
35,3170	C: 72714 0	I: 43345 1	C: 03636 1	C: 02317 0	C: 17626 1	I: 77614 1	C: 61310 1	C: 73201 0
35,3200	C: 02257 0	I: 52145 0	C: 06524 1	C: 03463 0	I: 52375 1	C: 03552 0	C: 03536 1	I: 41456 0
35,3210	C: 26311 0	C: 03536 1	I: 53435 0	C: 03544 1	C: 02261 0	I: 77616 0	I: 77220 1	C: 03470 1
35,3220	C: 03560 1	I: 65315 0	C: 03552 0	C: 03610 0	I: 65325 0	C: 03621 0	C: 03641 1	I: 46125 0
35,3230	C: 03467 1	C: 73225 1	I: 77745 1	I: 41545 0	C: 06524 1	I: 77624 1	C: 73376 1	C: 27444 0
35,3240	C: 00007 0	C: 27506 1	C: 03444 0	I: 63256 0	C: 03526 1	I: 41456 0	I: 50235 0	C: 00001 0
35,3250	C: 02261 0	I: 77715 1	I: 72441 0	C: 00001 0	I: 75326 1	I: 43244 1	C: 73260 1	C: 06522 0
35,3260	C: 15756 1	C: 03631 0	I: 77625 0	C: 03610 0	C: 03452 1	I: 40335 0	C: 03467 1	C: 00001 0
35,3270	I: 63225 0	C: 03653 1	C: 03536 1	C: 26323 1	C: 03544 1	C: 26321 0	C: 22000 1	I: 77624 1
35,3300	C: 73357 1	I: 64375 1	C: 02366 0	C: 00001 0	I: 77772 0	C: 37434 0	C: 03470 1	I: 45020 1
35,3310	C: 03463 0	C: 73357 1	I: 61375 1	C: 03434 1	C: 00001 0	I: 77772 0	C: 02366 0	I: 63255 0
35,3320	C: 03544 1	C: 03526 1	I: 65325 0	C: 03442 0	C: 03631 0	I: 41525 0	C: 06522 0	I: 77624 1
35,3330	C: 73376 1	I: 77775 1	C: 00001 0	C: 03444 0	I: 41575 0	C: 02311 0	I: 57435 1	C: 02261 0
35,3340	I: 41456 0	I: 76435 1	C: 02311 0	I: 77715 1	I: 64215 1	C: 02366 0	C: 00001 0	I: 77772 0
35,3350	C: 36303 1	C: 03463 0	I: 40220 0	C: 03463 0	C: 00001 0	I: 77650 1	C: 73334 1	I: 57575 1
35,3360	C: 02261 0	C: 24007 0	C: 03536 1	I: 57456 1	C: 00015 0	I: 76435 1	C: 02261 0	C: 00001 0
35,3370	I: 43401 0	C: 40023 0	I: 65325 0	C: 06524 1	C: 02317 0	I: 41406 0	I: 45020 1	C: 03465 0

OCTAL LISTING FOR PARAGRAPH # 210, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

36,2000	C: 01056 0	C: 37167 0	C: 00457 1	C: 03250 0	C: 77777 0	C: 77731 1	C: 00307 0	C: 11040 0
36,2010	C: 00151 1	C: 05214 0	C: 77777 0	C: 77765 0	C: 00024 0	C: 30060 1	C: 00026 0	C: 30605 1
36,2020	C: 00013 0	C: 14303 1	C: 00030 1	C: 00014 1	C: 01512 0	12327 1	12616 0	13066 0
36,2030	15261 0	12150 0	C: 00000 1	C: 03761 1	C: 64067 1	12402 1	12567 0	12525 0
36,2040	C: 01450 1	12327 1	12620 0	13053 0	15261 0	12150 0	C: 04300 0	C: 03672 1
36,2050	C: 74066 1	12372 1	12567 0	12510 0	13127 1	12153 0	C: 77776 1	C: 03402 1
36,2060	C: 74066 1	12404 1	12573 0	C: 01450 1	12324 1	12620 0	13053 0	15261 0
36,2070	12150 0	C: 5120 1	C: 03672 1	C: 74066 1	12372 1	12567 0	12545 0	13424 1
36,2100	C: 01476 0	12327 1	12616 0	13003 0	15261 0	12153 0	C: 04300 0	C: 03761 1
36,2110	C: 64067 1	12402 1	12567 0	12464 1	C: 01477 1	12327 1	12616 0	13066 0
36,2120	15261 0	12122 0	12123 1	12124 0	12125 1	12402 1	12567 0	12535 1
36,2130	05353 1	C: 04024 0	34755 1	55507 0	55510 0	04616 1	C: 73707 0	00066 1
36,2140	31442 1	53512 1	00004 0	04674 0	C: 75570 1	00003 1	51455 1	10005 0
36,2150	44762 1	04616 1	C: 74670 0	06042 1	1: 45345 1	C: 03442 0	C: 35147 0	C: 34041 0
36,2160	C: 61071 0	1: 45014 0	C: 03347 1	C: 74202 1	C: 27044 1	1: 64375 1	C: 00025 0	C: 01734 0
36,2170	1: 77762 1	C: 25726 0	C: 00017 1	1: 64312 0	C: 01734 0	C: 25720 1	C: 67067 1	C: 16317 0
36,2200	C: 00015 0	C: 00041 1	1: 77624 1	C: 27555 1	12212 1	00006 1	31561 1	53442 0
36,2210	00006 1	33147 0	21442 0	52155 1	53500 1	00006 1	43762 0	21500 1
36,2220	00006 1	31500 0	05277 0	C: 02242 1	C: 74067 0	05253 1	C: 20254 0	05221 1
36,2230	C: 00077 1	15155 1	44762 1	55162 1	06042 1	1: 51575 1	C: 03553 1	C: 03472 0
36,2240	1: 77776 1	15155 1	33762 1	05173 1	C: 02300 0	05253 1	C: 40154 0	44752 1
36,2250	55162 1	51455 1	40006 0	00006 1	65261 1	33151 1	05173 1	C: 02270 0
36,2260	35027 1	05072 1	C: 02265 1	C: 74067 0	15261 0	04616 1	C: 20457 0	15155 1
36,2270	35027 1	05072 1	C: 02275 0	C: 74067 0	15261 0	23765 0	04616 1	C: 20466 1
36,2300	33150 0	05173 1	C: 02354 1	44762 1	55162 1	51455 1	30006 1	00006 1
36,2310	62327 0	55477 0	05173 1	C: 02350 0	36250 0	54001 1	46250 1	52752 0
36,2320	40025 1	55052 0	51455 1	10001 1	40006 1	74737 1	26106 1	00006 1
36,2330	51455 1	30010 0	53252 1	34752 0	54001 1	44752 1	52760 1	40025 1
36,2340	55060 1	00006 1	34755 1	52754 0	10762 0	15261 0	04635 0	C: 77410 1
36,2350	02663 0	05353 1	C: 00001 0	15261 0	00006 1	34755 1	52756 1	23762 1
36,2360	05173 1	C: 02407 0	05516 0	C: 00153 0	75516 0	C: 00154 1	05516 0	C: 00122 0
36,2370	51455 1	10011 0	10756 1	12402 1	34736 1	05105 0	C: 02540 1	C: 56067 0

OCTAL LISTING FOR PARAGRAPH # 211, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

36,2400	05353 1	C: 00053 1	44760 0	55162 1	05353 1	C: 40074 0	15261 0	40103 1
36,2410	74737 1	26103 1	05321 1	C: 00077 1	12425 1	31422 1	05203 0	C: 03667 0
36,2420	C: 72067 0	05327 1	C: 40033 0	C: 05014 1	C: 77777 0	34740 0	70103 1	00006 1
36,2430	51455 1	13012 0	40101 0	74745 1	26101 0	44355 1	00006 1	02011 0
36,2440	64737 0	00006 1	01011 0	00006 1	30025 0	53342 1	44735 0	70111 1
36,2450	54111 1	10006 1	31517 0	53442 0	00006 1	30025 0	21442 0	44742 0
36,2460	70104 0	54154 0	51455 1	10013 1	00006 1	33143 1	53252 1	30005 1
36,2470	55162 1	40105 1	74743 1	26105 1	40103 1	74741 0	26103 1	00006 1
36,2500	30025 0	53442 0	34755 1	55346 0	55621 1	34752 0	55623 0	12545 0
36,2510	40101 0	74745 1	05006 1	12545 0	31422 1	05203 0	C: 03667 0	C: 72067 0
36,2520	05327 1	C: 40033 0	C: 05014 1	C: 77777 0	12545 0	25015 0	54003 0	31412 1
36,2530	55537 0	31413 0	55541 1	35016 0	54003 0	30005 1	55162 1	00006 1
36,2540	33145 1	53252 1	40103 1	74741 0	26103 1	44744 0	70111 1	54111 1
36,2550	34743 0	70106 1	10000 0	13526 1	05516 0	C: 00153 0	05516 0	C: 00154 1
36,2560	05516 0	C: 00161 1	05353 1	C: 40054 1	05221 0	C: 00062 0	02657 1	00006 1
36,2570	34755 1	52761 1	15261 0	04635 0	C: 73656 0	05504 0	C: 00161 1	05504 0
36,2600	C: 00175 1	34751 0	55515 0	10764 0	12607 0	04616 1	C: 74667 0	44765 0
36,2610	55162 1	05353 1	C: 00004 0	15155 1	51455 1	10002 1	30005 1	12621 1
36,2620	44762 1	55162 1	05516 0	C: 00161 1	05516 0	C: 00175 1	15155 1	05353 1
36,2630	C: 00003 1	00004 1	06032 0	C: 73667 1	04674 0	C: 75565 0	05504 0	C: 00212 1
36,2640	02651 1	C: 00311 0	05504 0	C: 00314 1	34752 1	00004 0	05173 1	C: 02354 1
36,2650	15155 1	30002 0	05522 1	40000 0	00006 1	06001 0	15511 0	44746 1
36,2660	70111 1	54111 1	03002 0	40111 1	74746 1	26111 1	00002 0	34755 1
36,2670	55162 1	04645 1	55060 1	00006 1	31442 1	52155 1	00006 1	40025 1
36,2700	20155 1	07262 0	34777 1	54002 1	52155 1	74346 0	00006 1	10002 1
36,2710	30001 0	64752 0	00004 0	05173 1	C: 02723 0	05327 1	C: 40036 0	C: 05024 1
36,2720	C: 13000 0	31000 0	04640 1	40025 1	55064 0	11162 1	12737 1	12730 0
36,2730	37720 0	05072 1	C: 02743 0	C: 74067 0	05221 0	C: 00144 0	12723 1	00006 1
36,2740	34755 1	52764 0	15261 0	00006 1	41442 0	53454 1	00006 1	30025 0
36,2750	21454 1	00004 0	11162 1	15155 1	15155 1	40000 0	00003 1	50000 1
36,2760	13015 1	44755 0	55066 1	30371 1	04616 1	C: 20474 1	13017 0	12614 1
36,2770	12627 1	33152 1	04616 1	C: 20460 1	13017 0	13034 1	12771 0	51455 1

OCTAL LISTING FOR PARAGRAPH # 212, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

36,3000	30030 1	04616 1	C: 20466 1	44743 1	55066 1	51455 1	30000 1	04616 1
36,3010	C: 20474 1	13117 0	13745 1	13750 0	04616 1	C: 20457 0	15155 1	03021 1
36,3020	16311 1	00014 1	00036 1	23141 1	02657 1	06032 0	C: 74350 1	05353 1
36,3030	C: 00031 0	30005 1	55162 1	01141 1	05353 1	C: 04624 0	34755 1	55162 1
36,3040	35023 0	05115 1	C: 03211 0	C: 64065 0	15155 1	05504 0	C: 00154 1	13106 1
36,3050	00004 1	51455 1	10003 0	24644 0	05105 0	C: 03227 0	C: 74067 0	00004 0
36,3060	04674 0	C: 40205 1	03021 1	05353 1	C: 01134 1	15155 1	35027 1	05105 0
36,3070	C: 02416 0	C: 30767 0	05516 0	C: 01175 1	00004 0	04674 0	C: 40205 1	03021 1
36,3100	05353 1	C: 07024 0	C: 17000 1	C: 02416 0	C: 30067 0	15155 1	40102 1	74737 1
36,3110	10000 0	13122 1	34753 1	00004 0	05173 1	C: 02432 0	34360 0	54001 1
36,3120	40110 0	52760 1	44762 1	55162 1	15155 1	05567 0	C: 01706 1	35006 1
36,3130	04616 1	C: 20477 1	16001 1	13135 1	13127 1	51455 1	10014 0	C: 02040 1
36,3140	C: 02050 0	C: 02163 0	C: 02410 0	C: 62067 1	C: 03372 1	C: 70067 1	C: 00000 1	C: 05656 1
36,3150	C: 04672 0	C: 07752 1	C: 01475 0	05353 1	C: 04024 0	32137 1	55455 0	30106 0
36,3160	74737 1	10000 0	13125 0	04616 1	C: 11236 0	40111 1	74737 1	10000 0
36,3170	32022 0	62023 1	55250 0	24751 0	55515 0	06042 1	1: 43175 0	C: 34001 1
36,3200	C: 02663 0	C: 03735 0	I: 77735 0	C: 26002 1	I: 70476 0	C: 37743 0	C: 56246 1	1: 77624 1
36,3210	C: 56413 1	I: 77776 1	00014 0	04674 0	C: 40143 0	03217 1	12130 0	00006 1
36,3220	23141 1	00003 1	05516 0	C: 00124 0	04616 1	C: 54123 0	01141 1	30005 1
36,3230	55162 1	00006 1	32060 0	53252 1	33764 1	04616 1	C: 20636 0	03262 1
36,3240	13245 0	03227 0	05353 1	C: 00014 1	15155 1	00004 0	04674 0	C: 40154 0
36,3250	04674 0	C: 40141 1	00003 1	33765 0	04616 1	C: 20463 1	03262 1	13262 0
36,3260	03253 0	13242 1	00006 1	32110 0	53252 1	34755 1	55462 1	30005 1
36,3270	55162 1	00014 0	04674 0	C: 40115 0	00003 1	06001 0	33140 1	55455 0
36,3300	04616 1	C: 11236 0	06142 1	1: 71214 0	C: 00700 0	C: 75211 0	C: 34017 0	C: 37735 1
36,3310	C: 75314 0	I: 77745 1	C: 34021 0	C: 03735 0	I: 77624 1	C: 56246 1	1: 77624 1	C: 56413 1
36,3320	I: 77776 1	00014 0	04674 0	C: 40154 0	04674 0	C: 40141 1	03217 0	06042 1
36,3330	I: 45175 0	C: 03711 1	C: 57267 0	C: 03502 0	1: 77776 1	33765 0	04616 1	C: 20447 1
36,3340	35017 1	55162 1	05105 0	C: 03365 1	C: 74067 0	05327 1	C: 00076 0	C: 04024 0
36,3350	12137 1	34777 1	04616 1	C: 01736 1	31162 0	64752 0	00006 1	12351 1
36,3360	33765 0	04616 1	C: 20447 1	35017 1	05146 1	31162 0	00006 1	65155 0
36,3370	06042 1	1: 45175 0	C: 03701 1	C: 57267 0	C: 03502 0	1: 77776 1	34777 1	04616 1

OCTAL LISTING FOR PARAGRAPH # 213, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

36,3400	C: 01736 1	13365 0	06042 1	I: 77624 1	C: 75615 1	I: 45175 0	C: 03701 1	C: 57267 0
36,3410	C: 03502 0	I: 77776 1	04635 0	C: 65761 1	05352 1	C: 04024 0	33141 0	55455 0
36,3420	40106 1	74737 1	10000 0	03125 1	04616 1	C: 11236 0	36700 1	55250 0
36,3430	34751 0	55515 0	06042 1	I: 77214 0	C: 01072 0	C: 34007 1	C: 03735 0	I: 52135 1
36,3440	C: 26001 1	C: 75204 0	04616 1	C: 11236 0	06042 1	I: 77624 1	C: 27551 0	30155 0
36,3450	35173 1	C: 03453 0	15155 1	05353 1	C: 05014 1	C: 77777 0	00006 1	33770 1
36,3460	53252 1	34736 1	35105 0	C: 03517 1	C: 74067 0	12344 1	06042 1	I: 52275 0
36,3470	C: 03502 0	C: 03527 1	C: 03656 1	I: 77624 1	C: 57267 0	C: 03623 0	I: 77776 1	05253 1
36,3500	C: 10035 0	06042 1	I: 77775 1	C: 03656 1	C: 03502 0	I: 77776 1	04635 0	C: 65761 1
36,3510	23766 0	04616 1	C: 20636 0	06001 0	06001 0	13517 0	13242 1	06042 1
36,3520	I: 77775 1	C: 06524 1	C: 03623 0	C: 03502 0	I: 77776 1	03510 0	31517 0	03741 0
36,3530	05172 1	C: 03546 0	05516 0	C: 00153 0	05516 0	C: 07154 1	05516 0	C: 00044 1
36,3540	05253 1	C: 40114 1	05221 0	C: 00062 0	02657 1	05261 1	04674 0	C: 75551 1
36,3550	05261 1	34644 0	05105 0	C: 03227 0	C: 74067 0	24753 1	05203 0	C: 03612 1
36,3560	C: 74066 1	40106 1	74745 1	26103 1	02657 1	00006 1	30025 0	52342 1
36,3570	44745 1	70101 0	54101 0	44355 1	00006 1	02011 0	64736 1	00006 1
36,3600	01011 0	40111 1	74736 0	26111 1	44727 1	54055 0	24750 1	00006 1
36,3610	05014 1	04727 0	04674 0	C: 40205 1	05261 1	I: 45020 1	C: 03665 1	C: 56447 0
36,3620	I: 43014 0	C: 01307 1	C: 03665 1	C: 03705 0	C: 75627 1	I: 45345 1	C: 01234 0	C: 03763 0
36,3630	I: 53025 0	C: 03432 1	C: 75662 1	I: 43345 1	C: 03763 0	C: 03422 1	C: 03765 0	I: 77776 1
36,3640	10754 0	13667 1	34727 0	00004 0	05105 0	C: 02707 0	C: 56067 0	05227 1
36,3650	C: 00172 0	C: 10035 0	06042 1	I: 77745 1	C: 03765 0	C: 27763 0	C: 01220 0	C: 26323 1
36,3660	C: 01226 0	C: 02321 1	I: 45345 1	C: 03631 0	C: 01234 0	C: 37452 0	C: 03665 1	06042 1
36,3670	I: 77650 1	C: 03665 1	06042 1	I: 77624 1	C: 75615 1	I: 77776 1	00004 0	35016 0
36,3700	54073 0	40076 1	74743 1	10000 0	13711 1	40103 1	74745 1	10000 0
36,3710	13713 0	04635 0	C: 65761 1	04674 0	C: 40166 1	05516 0	C: 00044 1	05504 0
36,3720	C: 0161 1	00006 1	00006 1	21442 1	52155 1	00006 1	40025 1	20155 1
36,3730	07262 0	20155 1	03741 0	05173 1	C: 03546 0	05227 1	C: 40114 1	C: 00035 1
36,3740	15155 1	10000 0	13745 0	13745 0	34755 1	64753 1	56001 0	34755 1
36,3750	52517 1	31517 0	00002 0	C: 00000 1	C: 02734 0	C: 00000 1	C: 05670 0	C: 00000 1
36,3760	C: 10624 0	C: 00000 1	C: 00764 1	C: 05050 1	C: 04050 0	C: 04125 0	C: 04123 0	C: 03466 0
36,3770	C: 74067 0	C: 03771 0	C: 03772 0	CKSM 66604 0	a	a	a	a

OCTAL LISTING FOR PARAGRAPH # 214, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

37,2000	C: 07623 1	C: 26552 1	05311 1	C: 00007 0	02325 1	24755 1	55414 0	55440 1
37,2010	55441 0	55576 1	34361 1	55571 1	32476 0	02367 1	34736 1	55664 0
37,2020	06142 1	I: 62545 1	C: 02403 1	C: 15146 1	C: 02401 0	I: 77434 1	C: 21615 0	56154 1
37,2030	55044 1	32473 0	04616 1	C: 20477 1	02270 0	02237 1	02031 1	06042 1
37,2040	I: 47135 0	C: 01045 1	C: 21577 1	C: 02401 0	I: 60535 1	C: 01046 1	C: 02403 1	I: 57546 1
37,2050	I: 77752 1	C: 16437 0	C: 02403 1	I: 72556 1	C: 16435 1	C: 02401 0	I: 73406 1	C: 02675 1
37,2060	C: 16705 1	I: 77745 1	C: 02677 0	I: 77676 0	C: 36702 1	C: 47355 1	I: 77776 1	04616 1
37,2070	C: 16772 1	34726 1	70077 0	00006 1	12076 0	25414 1	05516 0	C: 00056 1
37,2100	02315 1	11414 0	02126 1	02320 1	00006 1	21575 1	05277 0	C: 02113 0
37,2110	C: 76765 0	32116 0	05123 0	32116 0	05127 1	05261 1	C: 76500 0	34755 1
37,2120	55047 1	31504 1	55050 1	51416 0	55420 1	02457 0	51414 1	02130 1
37,2130	02447 1	34361 1	55476 1	32474 1	55412 1	24753 1	55527 0	34755 1
37,2140	51415 0	54037 1	55472 0	02332 1	00004 0	34752 0	05173 1	C: 02151 0
37,2150	05155 0	00016 1	27412 0	21412 1	00006 1	62161 0	34742 1	05173 1
37,2160	C: 02151 0	34736 1	05105 0	C: 02166 1	C: 76065 0	05261 1	51414 1	02170 0
37,2170	02447 1	31412 1	00006 1	62175 0	05155 0	34756 1	55537 0	02332 1
37,2200	11473 1	02215 1	05675 0	41476 1	55476 1	00006 1	41473 1	21477 0
37,2210	06042 1	I: 45345 1	C: 02501 1	C: 02475 0	I: 45044 0	C: 76217 1	C: 76275 0	I: 56325 0
37,2220	C: 02477 1	I: 47175 0	C: 37056 0	C: 21613 0	C: 01050 0	I: 77776 1	11414 0	02301 1
37,2230	02457 0	32471 1	55412 0	51416 0	41417 0	55442 0	11415 1	12245 1
37,2240	44747 0	27565 1	34747 1	27567 0	12251 1	44747 0	27565 1	34747 1
37,2250	27563 1	02447 1	34755 1	55404 1	55405 0	34733 1	55440 1	55441 0
37,2260	30732 0	55413 1	02500 0	31502 1	55050 1	34755 1	55047 1	02457 0
37,2270	05516 0	C: 00007 0	44755 0	05314 1	05472 0	I: 43215 0	C: 06532 0	C: 37064 1
37,2300	I: 77616 0	00006 1	23571 0	34755 1	54321 0	54322 0	54323 1	04616 1
37,2310	C: 16772 1	04616 1	C: 17710 1	03047 1	01571 0	00006 1	23571 0	02311 0
37,2320	00006 1	23571 1	04616 1	C: 17202 1	02311 0	00006 1	23571 0	04616 1
37,2330	C: 16706 1	02311 0	00006 1	23417 1	02342 0	00003 1	30067 0	00006 1
37,2340	62346 1	05122 0	00004 0	51415 0	40037 1	55571 1	00004 0	51415 0
37,2350	30037 0	61571 0	00006 1	12335 1	51415 0	30037 0	51537 1	55472 0
37,2360	04112 0	51537 1	55473 1	51537 1	23474 1	00003 1	01417 1	54001 1
37,2370	12372 1	55571 1	34755 1	50001 0	54000 0	24001 0	11571 1	12371 1

OCTAL LISTING FOR PARAGRAPH # 215, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES LAUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

37,2400	00002 0	I: 65345 0	C: 37057 1	C: 02403 1	I: 57546 1	I: 73525 1	C: 02403 1	I: 74266 0
37,2410	C: 36001 0	C: 02405 1	I: 77634 0	C: 21574 1	C: 26433 1	C: 37057 1	C: 02564 1	I: 77616 0
37,2420	I: 47020 0	C: 00051 1	C: 21574 1	C: 02431 0	I: 51025 1	C: 02433 1	C: 76431 0	I: 77624 1
37,2430	C: 76275 0	I: 74261 1	C: 20212 1	C: 02405 1	I: 53321 1	C: 02643 1	C: 02564 1	C: 16564 1
37,2440	C: 02431 0	C: 02433 1	I: 47170 1	C: 02563 0	C: 21706 0	I: 77650 1	C: 00051 0	00006 1
37,2450	23420 0	06042 1	I: 77624 1	C: 76420 0	I: 77776 1	02315 1	01420 0	00006 1
37,2460	23417 1	31416 0	55051 0	32472 1	04616 1	C: 20477 1	02270 0	01417 1
37,2470	12461 1	C: 07626 1	C: 01542 0	C: 01451 1	C: 00072 1	C: 02727 0	C: 01664 1	C: 01642 0
37,2500	00004 0	31572 0	05173 1	C: 02536 0	34755 1	54037 1	54040 1	54041 0
37,2510	00003 1	33075 0	55571 1	33076 0	02367 1	06042 1	I: 77735 0	C: 37057 1
37,2520	C: 25477 1	C: 37077 1	C: 26445 0	C: 37057 1	C: 00325 0	C: 01472 1	I: 77735 0	C: 02441 1
37,2530	I: 50076 0	C: 76534 1	I: 77624 1	C: 76401 0	I: 77776 1	02035 1	31576 1	00006 1
37,2540	12542 1	05261 1	11533 1	30000 1	55531 0	40000 0	55530 1	44752 0
37,2550	61562 1	00006 1	12556 1	31412 1	00006 1	62562 1	31572 0	05173 1
37,2560	C: 02536 0	34755 1	56037 0	54324 0	34755 1	56040 0	54326 1	34755 1
37,2570	56041 1	54327 0	34736 1	05105 0	C: 02577 0	C: 76065 0	05261 1	11562 0
37,2600	02602 1	02604 1	04616 1	C: 15271 1	06042 1	I: 77745 1	C: 37066 0	C: 24051 0
37,2610	C: 00325 0	I: 76516 0	C: 02643 1	I: 57545 1	C: 00160 0	C: 16523 1	C: 00162 1	C: 02527 0
37,2620	I: 76001 1	C: 00001 0	C: 73019 0	I: 57535 0	C: 02563 0	I: 77640 0	C: 76772 1	I: 50135 0
37,2630	C: 02532 1	C: 76644 0	I: 72174 0	C: 00014 1	C: 02444 1	I: 62143 0	C: 02243 0	C: 77775 1
37,2640	C: 12545 0	I: 66104 1	C: 76625 0	C: 02444 1	I: 77770 1	C: 00010 0	I: 41343 0	C: 02533 0
37,2650	C: 37100 1	I: 43661 1	C: 21212 0	C: 02501 1	C: 06501 0	I: 40725 0	C: 37102 0	C: 02521 0
37,2660	I: 77732 1	I: 45425 0	C: 71216 1	C: 06563 1	I: 77100 0	C: 76646 1	C: 00004 0	I: 56743 1
37,2670	C: 75324 0	C: 75240 0	C: 12453 0	I: 77104 1	C: 76667 1	C: 00010 0	I: 66140 1	C: 02445 0
37,2700	C: 02445 0	I: 56743 1	C: 02453 1	C: 75216 0	I: 77612 0	C: 75276 0	C: 12501 0	I: 42743 1
37,2710	C: 75314 0	C: 75231 1	C: 12463 0	I: 42673 0	C: 75216 0	C: 75266 1	C: 12511 1	I: 40743 0
37,2720	C: 37105 1	C: 75216 0	I: 42772 0	C: 75256 1	C: 12521 1	I: 76104 0	C: 76676 1	C: 00010 0
37,2730	I: 64743 0	C: 12523 1	C: 02521 0	I: 55523 0	C: 02531 1	I: 76521 0	C: 02001 1	I: 77745 1
37,2740	C: 00155 0	C: 06531 0	I: 77745 1	C: 00160 0	C: 06521 1	I: 77745 1	C: 00162 1	C: 06523 0
37,2750	I: 77700 0	C: 76731 1	I: 76174 1	C: 00006 1	C: 00002 0	I: 57343 1	C: 02503 0	C: 37110 0
37,2760	I: 77722 0	I: 73406 1	I: 56072 1	C: 00046 0	C: 10021 0	I: 77745 1	I: 77746 1	C: 10027 0
37,2770	I: 77704 1	C: 76755 1	I: 77776 1	35016 0	54003 0	01400 1	11412 0	03034 0

OCTAL LISTING FOR PARAGRAPH # 216, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

37,3000	11440 1	13003 0	03005 1	30022 0	55414 0	06042 1	I: 65345 0	C: 02473 0
37,3010	C: 02477 1	I: 55525 0	C: 02501 1	I: 74276 1	C: 37110 0	I: 74521 1	C: 02643 1	C: 02740 0
37,3020	I: 77776 1	32475 0	04616 1	C: 17315 0	02315 1	11440 1	02263 1	06042 1
37,3030	I: 77624 1	C: 76401 0	I: 77776 1	02117 1	55412 0	11440 1	02447 1	05155 0
37,3040	35014 1	54003 0	34753 1	55576 0	05567 0	C: 01600 0	02270 0	33054 0
37,3050	05734 1	05516 0	C: 00007 0	05155 0	C: 01601 1	C: 06200 0	C: 00000 1	C: 00000 1
37,3060	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00004 0	C: 00002 0	C: 00220 1
37,3070	C: 77776 1	C: 35730 0	C: 00035 1	C: 10317 0	C: 17550 1	C: 00115 1	C: 01443 0	C: 04123 1
37,3100	C: 02265 1	C: 57223 0	C: 66451 1	C: 05427 0	C: 12577 1	C: 77567 0	C: 44202 1	C: 24276 1
37,3110	C: 14066 1	C: 23073 1	C: 11773 1	33407 1	04616 1	C: 20324 1	05563 1	05563 1
37,3120	13113 0	40103 1	74747 0	00006 1	13377 0	40104 0	74744 0	00006 1
37,3130	13403 1	06042 1	I: 77634 0	C: 21574 1	C: 34041 0	C: 27060 1	I: 77775 1	C: 06017 1
37,3140	C: 26170 0	C: 00025 0	C: 16105 1	C: 00015 0	C: 02114 1	C: 34041 0	C: 27044 1	I: 77775 1
37,3150	C: 00017 1	C: 26140 0	C: 00025 0	C: 02120 0	I: 77776 1	40103 1	74747 0	00006 1
37,3160	13226 1	40104 0	74744 0	00006 1	13370 1	06042 1	I: 77634 0	C: 21574 1
37,3170	C: 34041 0	C: 27412 0	I: 43175 0	C: 02170 0	C: 00263 1	C: 25535 0	C: 02105 1	C: 15543 1
37,3200	C: 02114 1	I: 43014 0	C: 04344 0	C: 77205 0	C: 00063 0	I: 77614 1	C: 01473 0	C: 35517 1
37,3210	C: 27110 1	I: 77775 1	C: 00001 0	C: 26207 0	C: 00007 0	C: 36215 1	C: 27412 0	I: 71214 0
37,3220	C: 01473 0	C: 00015 0	C: 00041 1	I: 43175 0	C: 02140 0	C: 00263 0	C: 25535 0	C: 02120 0
37,3230	C: 15543 1	C: 02114 1	I: 43014 0	C: 04344 0	C: 77236 0	C: 00063 1	C: 35517 1	C: 27110 1
37,3240	I: 52375 1	C: 00001 0	C: 02207 0	I: 65234 1	C: 21725 1	C: 04045 0	I: 77657 0	C: 20201 0
37,3250	C: 26201 0	C: 00007 0	I: 51251 1	C: 02215 0	I: 77752 1	C: 26203 1	C: 02207 0	I: 63256 0
37,3260	C: 06516 0	I: 77624 1	C: 47663 1	I: 41505 1	C: 01734 0	I: 72431 1	C: 00001 0	I: 53445 1
37,3270	C: 00007 0	I: 47315 0	C: 00001 0	C: 02215 0	I: 50235 0	C: 00001 0	C: 00015 0	I: 77715 1
37,3300	I: 75241 1	C: 00017 0	C: 00015 0	I: 65512 1	C: 26205 1	C: 00001 0	I: 51041 0	C: 00007 0
37,3310	C: 77315 0	I: 45345 1	C: 06532 0	C: 02205 1	C: 02205 1	I: 77776 1	34747 1	71043 0
37,3320	00006 1	15472 1	41043 0	74740 1	27042 1	13155 1	37713 0	05146 1
37,3330	06042 1	I: 40375 1	C: 01220 0	C: 00001 0	C: 26207 0	C: 01226 0	C: 26215 0	C: 01726 0
37,3340	I: 65315 0	C: 01720 0	C: 01234 0	I: 77776 1	35015 0	05146 1	06042 1	I: 77214 0
37,3350	C: 03347 1	C: 77363 1	I: 61505 1	C: 01724 0	I: 77715 1	I: 76505 0	C: 01734 0	I: 40206 1
37,3360	C: 00001 0	I: 77650 1	C: 77240 1	I: 77624 1	C: 27412 0	I: 52014 0	C: 01673 1	C: 77222 0
37,3370	06042 1	I: 77634 0	C: 21574 1	C: 34041 0	C: 27060 1	I: 77650 1	C: 77211 0	40102 0

OCTAL LISTING FOR PARAGRAPH # 217, WITH PARITY BIT IN EINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

37,3400	74744 0	10006 1	13326 1	06042 1	I: 52034 1	C: 21574 1	C: 77144 0	C: 04066 0
37,3410	34757 0	03527 1	35031 0	05072 1	C: 03671 1	C: 14763 1	02541 1	40103 1
37,3420	74773 1	26103 1	44735 0	70076 1	54076 1	34751 0	55256 0	37713 0
37,3430	05105 0	C: 02463 1	C: 46067 1	34752 0	02523 0	25007 1	05224 0	43535 0
37,3440	60030 1	10000 0	44753 0	13445 0	34753 1	26020 0	03536 1	34756 1
37,3450	03527 1	34753 1	55256 0	34736 1	05105 0	C: 02206 1	C: 66067 0	34743 0
37,3460	00006 1	05111 1	30103 0	74747 0	00006 1	12515 1	30102 1	74744 0
37,3470	00006 1	12512 1	10754 0	13513 1	34757 1	55055 1	40025 1	64756 1
37,3500	64734 0	64734 0	57054 1	34361 1	54001 1	40000 0	52754 0	36007 0
37,3510	05203 0	C: 02006 0	C: 42067 0	34751 0	13434 0	00006 1	33524 0	52252 1
37,3520	34751 0	03523 0	05261 1	54001 1	40025 1	55062 0	13520 0	54001 1
37,3530	40001 1	52762 0	00002 0	C: 03661 0	C: 44067 0	C: 37771 1	00006 1	30025 0
37,3540	53561 0	44755 0	55253 0	55254 1	55255 0	34755 1	54330 0	54231 1
37,3550	54326 1	54327 0	54225 1	55256 0	00006 1	40040 1	53254 1	52040 1
37,3560	54324 0	22326 0	40041 0	57255 1	56041 1	54330 0	00006 1	31561 1
37,3570	53247 0	00006 1	41234 1	21247 0	30032 0	55154 1	30033 1	55155 0
37,3600	30034 0	55156 0	30324 1	55157 1	30326 0	55160 0	30330 1	55161 1
37,3610	00002 0	11256 0	13437 0	33651 0	54002 1	10330 0	13566 0	13622 0
37,3620	13566 0	13566 0	22007 0	10326 1	13627 0	13636 0	13627 0	22041 1
37,3630	11255 0	41255 0	13565 0	13631 1	22330 1	13566 0	11253 0	41253 0
37,3640	13643 1	13637 1	13554 1	54324 0	41254 1	54326 1	44755 0	52040 1
37,3650	13562 1	C: 03447 0	05504 0	C: 00054 0	00004 0	00006 1	30025 0	52215 1
37,3660	03711 0	03654 0	52155 1	52317 0	00004 0	04616 1	C: 17167 1	05516 0
37,3670	C: 00007 0	05516 0	C: 00010 0	34741 1	00006 1	05013 0	05353 1	C: 07024 0
37,3700	C: 20000 0	C: 03731 1	C: 76060 0	34774 1	04616 1	C: 20674 0	13703 1	13703 1
37,3710	13703 1	00006 1	22156 0	04103 1	00003 1	52155 1	34747 1	54001 1
37,3720	34755 1	20145 1	44246 0	70155 1	56155 0	74346 0	10000 0	24156 0
37,3730	00156 0	44741 0	00006 1	03013 0	00004 0	34755 1	54001 1	52025 1
37,3740	03711 0	03734 1	00006 1	40317 0	20155 1	34742 1	07312 0	34755 1
37,3750	54156 1	07262 0	10154 0	03760 0	03760 0	03756 0	34742 1	26154 0
37,3760	00006 1	03115 0	20155 1	07262 0	52155 1	20025 1	05516 0	C: 00054 0
37,3770	06001 0	C: 03771 0	C: 03772 0	CKSM 46751 0	a	a	a	a

OCTAL LISTING FOR PARAGRAPH # 220, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

40,2000	35017 1	05105 1	C: 02017 0	C: 60104 1	34740 0	05146 1	32076 1	04616 1
40,2010	C: 20353 0	05563 1	05563 1	05563 1	34751 0	05464 1	05155 0	00006 1
40,2020	30036 1	02155 1	06042 1	I: 77624 1	C: 46065 0	C: 00001 0	C: 14007 0	C: 06524 1
40,2030	C: 24011 1	C: 10007 0	I: 77656 1	C: 00007 0	I: 77641 1	C: 06516 0	C: 24021 1	C: 06522 1
40,2040	I: 77641 1	C: 00007 0	C: 34023 1	C: 47322 1	I: 43244 1	C: 60047 1	C: 06532 0	C: 26203 1
40,2050	C: 00001 0	I: 77641 1	C: 06520 1	C: 24023 0	C: 00001 0	I: 77641 1	C: 00007 0	C: 34021 0
40,2060	C: 47322 1	I: 43244 1	C: 60064 0	C: 06532 0	C: 02201 0	I: 77776 1	34777 1	04616 1
40,2070	C: 01736 1	34747 1	71643 0	10000 0	02017 0	05472 0	C: 04070 1	34753 1
40,2100	57011 0	54115 0	11041 1	02105 1	02112 1	42156 0	60154 1	00006 1
40,2110	12112 0	04374 0	56154 1	54117 1	50000 1	02116 0	03470 1	02175 0
40,2120	02175 0	02175 0	02175 0	02175 0	02175 0	02175 0	02161 0	02161 0
40,2130	03470 1	03470 1	03470 1	03470 1	03470 1	03470 1	02173 0	02354 1
40,2140	03646 0	03470 1	03470 1	03470 1	03470 1	03470 1	03470 1	03524 1
40,2150	02407 0	02374 0	02157 0	03470 1	02467 0	02370 1	C: 00122 1	04635 0
40,2160	C: 62002 1	10776 0	02166 1	02166 1	05155 0	05155 0	36250 0	70777 1
40,2170	10000 0	02175 0	03470 1	34755 1	54117 1	10776 0	02202 0	02202 0
40,2200	02201 0	05155 0	02324 0	11014 1	34755 1	55014 1	02207 0	50117 0
40,2210	34066 0	74346 0	54124 1	30776 1	54143 0	03356 1	36250 0	70777 1
40,2220	10000 0	02232 0	50137 1	57000 0	54022 0	40022 0	40022 0	56022 1
40,2230	60117 0	02247 1	50137 1	57000 0	54154 0	34755 1	54155 1	34263 0
40,2240	07312 0	56155 0	60117 0	54155 1	02247 1	26154 0	02265 1	50137 1
40,2250	55000 1	40776 0	50137 1	62315 1	00006 1	12257 1	02312 0	36250 0
40,2260	70777 1	10000 0	02265 1	40776 0	02313 1	44753 0	60137 1	00006 1
40,2270	62263 1	07106 1	C: 02322 0	36250 0	70777 1	50000 1	02276 0	02303 0
40,2300	00006 1	40156 1	52156 1	56156 0	50137 1	55003 1	56155 0	50137 1
40,2310	55000 1	02263 1	10776 0	54776 0	05155 0	C: 00022 1	C: 00020 0	C: 00012 1
40,2320	C: 00005 1	C: 00000 1	C: 05174 0	C: 13261 0	50776 1	02330 0	54137 0	00002 0
40,2330	C: 00004 0	C: 00004 0	C: 00004 0	C: 00004 0	C: 00004 0	C: 00003 1	C: 00003 1	C: 00003 1
40,2340	C: 00003 1	C: 00003 1	C: 00002 0	C: 00002 0	C: 00002 0	C: 00002 0	C: 00002 0	05675 0
40,2350	C: 00001 0	C: 00001 0	C: 00000 1	C: 00000 1	34755 1	55000 1	34360 0	54776 0
40,2360	02611 1	34753 1	54777 1	34755 1	55012 1	34217 1	54136 1	05155 0
40,2370	34755 1	55001 0	34361 1	02357 1	02446 0	02433 1	34752 0	50137 1

OCTAL LISTING FOR PARAGRAPH # 221, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

40,2400	64745 0	26777 1	11014 1	34755 1	55014 1	02406 1	05155 0	02446 0
40,2410	72413 0	34753 1	02377 0	22002 0	02324 0	50137 1	32441 1	54123 0
40,2420	64753 1	54122 1	34755 1	54124 1	56123 1	02440 1	34741 1	54124 1
40,2430	56122 0	03440 1	00001 0	22002 0	02324 0	50137 1	32441 1	54122 1
40,2440	64753 1	54123 0	02422 1	C: 00005 1	C: 00003 1	C: 00000 1	22002 0	36250 0
40,2450	70777 1	10000 0	05155 0	44317 1	02462 0	44320 0	02462 0	44321 1
40,2460	02462 0	05155 0	60776 1	00006 1	12466 0	00002 0	00001 0	10776 0
40,2470	64753 1	02473 0	64753 1	50000 1	32330 0	54137 0	11014 1	02505 0
40,2500	02502 1	02502 1	30137 1	02527 0	02522 0	10137 0	54137 0	02527 0
40,2510	32577 0	27012 1	30137 1	54125 0	00006 1	27000 1	04616 1	C: 62342 0
40,2520	30125 1	54137 0	02520 1	25014 0	05155 0	22002 0	02540 1	67751 0
40,2530	10000 0	00002 0	05675 0	05155 0	00002 0	54776 0	22002 0	02324 0
40,2540	34755 1	50137 1	55000 1	50137 1	55003 1	54124 1	50137 1	44745 1
40,2550	70777 1	72600 1	54777 1	50137 1	32570 1	54143 0	03356 1	50137 1
40,2560	32573 1	54776 0	02601 1	44752 1	26776 0	02601 1	50137 1	34215 1
40,2570	54776 0	00001 0	C: 00016 0	C: 00005 1	C: 00004 0	C: 00015 0	C: 00011 1	C: 00003 1
40,2600	C: 77774 0	30776 1	54021 0	42614 1	00004 0	54021 1	57022 0	00006 1
40,2610	62612 0	25015 1	00003 1	00002 0	C: 04000 0	34755 1	54156 1	02706 1
40,2620	02622 0	02701 0	02717 1	02625 1	02615 1	30154 1	74733 0	00006 1
40,2630	12634 0	40154 0	64753 1	54154 0	00002 0	00006 1	00023 1	00006 1
40,2640	74742 0	40000 0	76250 1	54154 0	02733 1	02671 0	40110 0	74751 1
40,2650	10000 0	02657 1	52155 1	20001 1	20001 1	20001 1	52155 1	07106 1
40,2660	C: 01123 1	02745 0	02671 0	00006 1	42670 0	20155 1	02657 1	C: 00001 0
40,2670	C: 01150 1	34733 1	70154 0	54155 1	30154 1	60000 1	74753 0	54154 0
40,2700	00002 0	00006 1	50156 0	32730 1	52124 1	00002 0	10154 0	00002 0
40,2710	00002 0	12712 0	44735 0	70154 0	54154 0	50002 0	00001 0	00006 1
40,2720	50156 0	02730 1	52155 1	07312 0	52124 1	20155 1	02736 1	C: 05605 1
40,2730	C: 03656 1	C: 16314 0	C: 31463 1	52124 1	52155 1	04415 0	04635 0	C: 62570 1
40,2740	52124 1	52155 1	04415 0	02745 0	02757 0	56156 0	56155 0	54154 0
40,2750	02736 1	02757 0	02726 1	02757 0	36245 1	03207 1	02736 1	56002 0
40,2760	54162 0	03003 1	07262 0	07106 1	C: 00123 1	00162 1	02536 0	02413 0
40,2770	30154 1	03042 1	46250 1	50117 0	64317 0	54776 0	03003 1	30155 0

OCTAL LISTING FOR PARAGRAPH # 222, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

4),3000	03342 1	04635 0	C: 62572 1	56002 0	54144 1	50140 1	03006 1	03023 0
4),3010	50117 0	30150 0	74356 1	04313 1	00006 1	50000 1	30001 0	52155 1
4),3020	34755 1	54156 1	00144 0	30145 1	03014 1	50140 1	03026 0	03031 0
40,3030	03454 1	00006 1	50145 1	20001 0	52155 1	34317 0	54776 0	34755 1
40,3040	54156 1	07262 0	03327 1	00136 0	07106 1	C: 03120 0	10155 1	34741 1
40,3050	03052 0	44741 0	60155 0	03221 0	04404 0	04404 0	03230 0	04404 0
40,3060	10154 0	03065 1	03065 1	40000 0	54154 0	10162 0	03124 0	03077 1
40,3070	10154 0	05675 0	03122 0	03074 1	56154 1	74733 0	54154 0	50140 1
40,3100	03100 0	03104 1	03114 0	03105 0	03117 0	40000 0	64752 0	00006 1
40,3110	13112 1	02625 1	04635 0	C: 63161 1	04616 1	C: 63000 0	03103 0	04616 1
40,3120	C: 63032 0	03105 0	44733 0	03076 0	40154 0	74733 0	40000 0	03076 0
40,3130	C: 26161 0	C: 30707 1	07106 1	C: 00123 1	56156 0	56155 0	56154 1	00006 1
40,3140	13142 1	04145 0	03217 0	03230 0	03112 0	07106 1	C: 00123 1	03142 0
40,3150	07106 1	C: 00123 1	56156 0	60000 1	54156 1	34755 1	60155 0	03221 0
40,3160	03230 0	50140 1	03162 1	03173 1	30117 0	60145 1	54002 1	56155 0
40,3170	50002 0	54001 1	03112 0	34755 1	03165 0	07106 1	C: 00123 1	36245 1
40,3200	03207 1	03152 1	07106 1	C: 00123 1	34752 0	03207 1	03152 1	56002 0
40,3210	54124 1	56002 0	54123 0	04404 0	10123 0	03212 0	00124 0	56155 0
40,3220	60000 1	54155 1	00002 0	60154 1	54154 0	00002 0	54162 0	00002 0
40,3230	10162 0	04145 0	00002 0	04145 0	56002 0	54144 1	10154 0	03247 0
40,3240	03247 0	64753 1	54154 0	02433 1	40155 1	54155 1	00144 0	02413 0
40,3250	00144 0	00006 1	34315 0	20155 1	00006 1	13261 0	00006 1	34733 1
40,3260	52155 1	00002 0	56002 0	54115 0	03234 1	03251 1	34751 0	54137 0
40,3270	34363 0	07312 0	50154 1	34066 0	74346 0	54124 1	34755 1	56156 0
40,3300	56155 0	54154 0	56776 1	54143 0	10000 0	54776 0	03356 1	10137 0
40,3310	03267 1	44360 1	54776 0	00115 1	C: 00000 1	C: 02476 0	56002 0	54115 0
40,3320	03234 1	03246 0	56002 0	54115 0	03234 1	34753 1	03267 1	56002 0
40,3330	54115 0	34755 1	54124 1	36250 0	03440 1	34751 0	03440 1	03234 1
40,3340	34320 1	03267 1	00006 1	73352 1	22154 1	34755 1	54155 1	56002 0
40,3350	54115 0	03325 0	C: 00244 0	03342 1	04635 0	C: 62351 1	56002 0	54114 1
40,3360	34346 1	70143 0	54021 0	56021 1	54141 1	34753 1	70143 0	10000 0
40,3370	03372 1	3402 1	56124 0	04340 1	54124 1	34736 1	70143 0	10000 0

OCTAL LISTING FOR PARAGRAPH # 224, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

41,2000	03552 0	03001 0	34755 1	55014 1	34217 1	54136 1	11012 1	02035 0
41,2010	02035 0	02012 0	02033 0	61012 0	00006 1	12127 1	36250 0	70777 1
41,2020	10000 0	02023 1	02127 0	10776 0	02353 0	02027 0	02027 0	41012 1
41,2030	55012 1	04423 1	01012 0	C: 03437 1	C: 00034 1	34755 1	54777 1	44360 1
41,2040	54776 0	41000 1	55040 0	62034 1	00006 1	62133 1	00006 1	32114 1
41,2050	52006 0	50140 1	02052 1	02055 0	02221 1	10146 0	02131 0	02353 0
41,2060	02064 1	25016 1	04211 0	02120 0	34735 1	55014 1	44217 0	60136 0
41,2070	00036 1	12073 0	02116 0	02311 0	10777 1	04145 0	44360 1	54776 0
41,2100	11041 1	02144 0	02105 1	02104 0	04427 1	57004 1	04303 0	00006 1
41,2110	32114 1	52006 0	02133 1	C: 02103 1	C: 64101 0	C: 77772 0	30156 0	04303 0
41,2120	44756 0	61000 0	00006 1	12133 0	34321 0	54776 0	31016 1	03371 1
41,2130	02133 1	64752 1	04313 0	42145 1	61000 0	10100 0	64753 1	02141 1
41,2140	02146 0	54154 0	04457 0	04635 0	C: 66000 1	C: 00050 1	51000 0	32151 0
41,2150	04640 1	C: 62353 0	C: 62367 1	C: 62375 1	C: 62402 0	C: 62362 1	C: 62355 0	C: 62525 1
41,2160	C: 61025 1	C: 62353 0	C: 62353 0	C: 61454 0	C: 63236 0	C: 63236 0	C: 63236 0	C: 63236 0
41,2170	C: 63236 0	C: 63236 0	C: 63236 0	C: 62353 0	C: 62353 0	C: 62353 0	C: 62736 1	C: 62747 1
41,2200	C: 62764 0	C: 62707 0	C: 62622 0	C: 62353 0	C: 63361 0	C: 62353 0	C: 62353 0	C: 63474 0
41,2210	C: 63520 0	C: 61521 0	C: 61476 0	C: 61504 1	C: 63621 1	C: 12447 0	C: 63426 0	C: 62353 0
41,2220	C: 62353 0	10146 0	02226 0	02353 0	02226 0	02226 0	46245 0	61000 0
41,2230	00006 1	62233 1	02133 1	34752 0	54117 1	62260 1	54145 0	50117 0
41,2240	30150 0	54122 1	03041 0	02261 0	02246 0	24122 0	30122 0	74256 1
41,2250	04313 1	50000 1	30000 1	50145 1	56000 1	10117 1	02234 0	02133 1
41,2260	00125 1	50000 1	12263 0	00002 0	00002 0	00002 0	00002 0	12303 1
41,2270	12303 1	00002 0	12303 1	00002 0	00002 0	12303 1	00002 0	00002 0
41,2300	00012 0	00012 0	00002 0	50002 0	00001 0	34317 0	12312 1	34320 1
41,2310	12312 1	34321 0	54776 0	40002 1	55012 1	04616 1	C: 60526 1	04427 1
41,2320	00136 0	55001 0	56002 0	54117 1	00006 1	32114 1	52006 0	10146 0
41,2330	64753 1	12334 0	12335 1	12335 1	04302 0	34361 1	54776 0	31001 1
41,2340	12347 1	55040 1	56002 0	54117 1	34360 0	54776 0	31000 0	04635 0
41,2350	C: 61353 0	00117 0	04145 0	04635 0	C: 61454 0	44752 1	02426 0	50145 1
41,2360	40002 1	56132 1	44753 0	02426 0	50145 1	40001 1	56131 1	02445 0
41,2370	02470 0	50145 1	40000 0	56130 0	02407 0	44753 0	02441 1	50145 1

OCTAL LISTING FOR PARAGRAPH # 225, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

41,2400	40001 1	02773 1	44752 1	02441 1	50145 1	40002 1	02373 1	44752 1
41,2410	61000 0	10000 0	02415 0	00136 0	02415 0	54122 1	50000 1	34317 0
41,2420	54776 0	50122 0	41130 1	03371 1	56122 0	02411 1	54123 0	22002 0
41,2430	02517 0	04321 1	76250 1	60123 1	10000 0	00001 0	05675 0	02253 0
41,2440	00001 0	54123 0	22002 0	02445 0	02430 1	00006 1	22156 0	02517 0
41,2450	74736 0	10000 0	02353 0	00156 0	22002 0	02517 0	74736 0	10000 0
41,2460	04145 0	00001 0	22002 0	02517 0	10000 0	00001 0	00001 0	02353 0
41,2470	22002 0	30145 1	64753 1	00006 1	12506 1	50140 1	02476 0	02501 1
41,2500	00001 0	03032 0	02261 0	00001 0	24145 1	00001 0	31016 1	75004 1
41,2510	00006 1	50000 1	00000 1	40000 0	12373 0	C: 00147 0	C: 00146 1	50140 1
41,2520	32514 0	50000 1	30000 1	74350 1	00002 0	02517 0	04331 1	76250 1
41,2530	54117 1	54122 1	60145 1	50000 1	40000 0	50122 0	57102 1	10122 1
41,2540	02531 1	34755 1	54155 1	54156 1	50117 0	34317 0	54776 0	50117 0
41,2550	41002 0	54154 0	13053 1	54123 0	00006 1	32567 1	52006 0	50140 1
41,2560	02560 0	02564 1	03040 0	02577 0	03032 0	02577 0	C: 02141 1	C: 64101 0
41,2570	04616 1	C: 61262 0	10117 1	02575 1	00136 0	54117 1	02541 0	50000 1
41,2600	32602 1	04640 1	C: 61452 0	C: 62570 1	C: 60615 0	C: 60733 0	C: 60744 0	C: 60751 1
41,2610	C: 60635 1	C: 61754 0	C: 65230 0	C: 65303 1	C: 60751 1	C: 60766 0	C: 60766 0	C: 60623 0
41,2620	C: 60645 0	C: 60662 0	44752 1	02426 0	02462 0	33012 1	02341 0	02305 0
41,2630	33012 0	02341 0	02307 1	33014 1	02341 0	02311 0	46245 0	03015 0
41,2640	00006 1	32114 1	52006 0	34755 1	03101 1	50145 1	54000 0	34753 1
41,2650	03101 1	50145 1	54001 1	34752 0	03101 1	50145 1	54002 1	44757 1
41,2660	61001 1	00006 1	12664 0	03001 0	31002 1	04304 1	31004 1	00004 0
41,2670	00006 1	12700 0	50145 1	40000 0	71003 1	50145 1	26000 0	02705 1
41,2700	41003 1	50145 1	70000 0	50145 1	54000 0	00003 1	03001 0	44753 0
41,2710	02426 0	02462 0	33012 1	02341 0	02305 0	33013 0	02341 0	02307 1
41,2720	44756 0	03015 0	00006 1	32114 1	52006 0	34755 1	03101 1	50145 1
41,2730	54000 0	34753 1	03101 1	50145 1	54001 1	03001 1	02305 0	00006 1
41,2740	32114 1	52006 0	34755 1	03101 1	50145 1	54000 0	03001 0	44753 0
41,2750	02426 0	34755 1	55014 1	02307 1	00006 1	32114 1	52006 0	34753 1
41,2760	03101 1	50145 1	54001 1	03001 0	44752 1	02426 0	34735 1	55014 1
41,2770	02311 0	00006 1	32114 1	52006 0	34752 0	03101 1	50145 1	54002 1

OCTAL LISTING FOR PARAGRAPH # 226, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" CNOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

41,3000	03001 0	34755 1	54777 1	44755 0	55013 0	04457 0	44360 1	54776 0
41,3010	44635 0	C: 61612 0	C: 00025 0	C: 00026 0	C: 00027 1	54117 1	40777 1	54021 0
41,3020	40021 0	40021 0	10000 0	13025 1	00002 0	60117 0	60006 1	13031 1
41,3030	44145 0	00002 0	56002 0	54114 1	34347 0	70147 1	04322 0	60114 0
41,3040	56002 0	54114 1	50117 0	33072 1	54001 1	50117 1	34346 1	70153 1
41,3050	50001 0	00000 1	00114 0	56002 0	54114 1	50140 1	03056 1	03075 0
41,3060	50117 0	23072 1	54001 1	50117 0	34346 1	70147 1	50001 0	00000 1
41,3070	60000 1	00114 0	13021 0	04322 0	04331 1	34346 1	70147 1	60000 1
41,3100	00114 0	54117 1	56002 0	54115 0	34755 1	54162 0	50117 0	57005 0
41,3110	54155 1	50117 0	57002 1	54154 0	50140 1	03115 1	03143 1	50117 0
41,3120	30150 0	74355 1	04303 0	00006 1	60117 0	54145 0	10777 1	03200 0
41,3130	02454 0	03047 0	02261 0	03161 1	24145 1	30145 1	26117 1	34755 1
41,3140	50117 0	53777 0	13161 1	04311 0	10777 1	03200 0	02454 0	03032 0
41,3150	02261 0	03155 0	34755 1	54117 1	03134 1	30146 1	64752 1	00006 1
41,3160	13165 1	56154 1	00115 1	C: 02147 1	C: 64101 0	44757 1	61016 1	00006 1
41,3170	13001 1	31016 1	75004 1	56154 1	00006 1	50154 1	01000 0	13001 0
41,3200	03053 1	54123 0	00006 1	33164 1	52006 0	50140 1	03206 0	03212 0
41,3210	03040 0	03213 1	03032 1	50000 1	33216 1	04640 1	C: 62352 1	C: 61142 1
41,3220	C: 61044 0	C: 61132 0	C: 61150 1	C: 61175 0	C: 61454 0	C: 61150 1	C: 65452 1	C: 61454 0
41,3230	C: 61202 0	C: 61145 0	C: 61454 0	C: 61044 0	C: 61454 0	C: 61454 0	43245 0	71016 0
41,3240	54155 1	40133 1	64217 1	10000 0	03253 0	C: 60000 1	03253 0	34736 1
41,3250	76155 1	34755 1	55021 1	36077 1	71000 1	04321 1	54022 0	40022 0
41,3260	56022 1	61001 1	54154 0	34755 1	55011 1	11041 1	03270 1	04502 1
41,3270	00004 0	11017 1	03277 0	34753 1	05203 0	C: 03303 1	C: 62101 0	52155 1
41,3300	53020 0	00003 1	00136 0	04400 1	11020 0	03311 1	03311 1	03322 1
41,3310	03322 1	33326 0	05203 0	C: 03303 1	C: 62101 0	34355 0	05072 1	C: 03327 1
41,3320	C: 62101 0	05261 1	34755 1	55017 1	55020 0	05261 1	C: 00144 0	11020 0
41,3330	03334 0	03334 0	05155 0	05155 0	11011 1	03357 0	36077 1	71017 1
41,3340	02321 0	34144 1	71017 1	63355 1	54023 1	30023 0	55000 1	33356 1
41,3350	54136 1	43245 0	71020 0	54156 1	02046 1	C: 75377 0	C: 04124 1	04374 0
41,3360	05155 0	34317 0	54776 0	21046 1	54001 1	21016 1	04651 1	03371 1
41,3370	05155 0	54022 0	56002 0	54115 0	34736 1	26776 0	34751 0	54137 0

OCTAL LISTING FOR PARAGRAPH # 230, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

42,2000	C: 26723 0	C: 00453 0	35021 1	05146 1	32034 1	04616 1	C: 20334 1	05472 0
42,2010	05472 0	42033 1	62154 1	00006 1	12016 0	05472 0	00004 0	34755 1
42,2020	54155 1	54001 1	52025 1	52155 1	53051 0	20155 1	07262 0	52155 1
42,2030	20025 1	00003 1	05472 0	C: 00027 1	C: 06230 0	34752 0	54002 1	50000 1
42,2040	30321 1	00006 1	72053 1	50002 0	56050 1	10002 1	12036 1	37743 0
42,2050	00006 1	05014 1	15261 0	C: 03146 1	05516 0	C: 00027 1	05516 0	C: 00031 0
42,2060	05516 0	C: 00007 0	06042 1	I: 77624 1	C: 27412 0	I: 77776 1	05353 1	C: 00002 0
42,2070	00004 0	04074 0	C: 40166 1	04674 0	C: 40115 0	06011 1	44736 0	00006 1
42,2100	03012 1	04035 0	C: 12766 0	52152 0	51001 1	32154 0	54146 0	51001 1
42,2110	32320 1	54147 1	41001 0	64771 1	00006 1	62121 1	34753 1	54140 0
42,2120	02137 0	34752 0	54140 0	51001 1	33064 0	54153 1	35012 1	70146 0
42,2130	54002 1	50001 1	32650 0	54150 1	00006 1	50002 0	32652 1	52152 0
42,2140	52006 0	52124 1	00006 1	50000 1	32557 1	52124 1	52006 0	52124 1
42,2150	00006 1	50000 1	32465 1	12145 1	C: 00000 1	C: 40000 0	C: 40000 0	C: 40000 0
42,2160	C: 01044 0	C: 01044 0	C: 01143 0	C: 01002 1	C: 01363 0	C: 00375 0	C: 77776 1	C: 03033 1
42,2170	C: 01050 0	C: 01776 0	C: 01050 0	C: 77777 0	C: 01050 0	C: 00000 1	C: 02344 0	C: 00000 1
42,2200	C: 00032 0	C: 00037 0	C: 00321 1	C: 00000 1	C: 01050 0	C: 01044 0	C: 01044 0	C: 01362 1
42,2210	C: 00000 1	C: 00001 1	C: 00000 1	C: 00000 1	C: 02142 1	C: 03441 0	C: 01044 0	C: 03453 0
42,2220	C: 00024 1	C: 03635 1	C: 01516 1	C: 00000 1	C: 64000 0	C: 02003 0	C: 24006 1	C: 24011 1
42,2230	C: 64014 0	C: 64017 0	C: 00022 1	C: 22025 0	C: 22030 1	C: 24033 1	C: 00000 1	C: 22041 1
42,2240	C: 00044 1	C: 00000 1	C: 24052 0	C: 24055 1	C: 02060 0	C: 00000 1	C: 24066 1	C: 24071 1
42,2250	C: 24074 1	C: 64077 0	C: 64102 0	C: 24105 0	C: 64110 0	C: 24113 1	C: 62116 0	C: 04121 1
42,2260	C: 64124 1	C: 24127 0	C: 64132 0	C: 04135 1	C: 02140 0	C: 02143 0	C: 64146 0	C: 64151 0
42,2270	C: 24154 1	C: 62157 0	C: 64162 0	C: 24165 0	C: 02170 0	C: 24173 1	C: 24176 1	C: 24201 1
42,2300	C: 24204 1	C: 24207 1	C: 24212 0	C: 02215 0	C: 24220 1	C: 24223 1	C: 24226 1	C: 04231 0
42,2310	C: 00000 1	C: 04237 0	C: 00000 1	C: 00000 1	C: 00000 1	C: 04253 1	C: 04256 1	C: 24261 1
42,2320	C: 00000 1	C: 04000 1	C: 04140 0	C: 04102 0	C: 00504 0	C: 00504 0	C: 04000 0	C: 04000 0
42,2330	C: 04000 0	C: 04000 0	C: 00000 1	C: 24400 0	C: 02000 0	C: 24400 0	C: 04140 0	C: 00000 1
42,2340	C: 24400 0	C: 00000 1	C: 04102 0	C: 00000 1	C: 04102 0	C: 04140 0	C: 04102 0	C: 00000 1
42,2350	C: 24400 0	C: 04140 0	C: 04000 0	C: 00140 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1
42,2360	C: 24400 0	C: 24400 0	C: 24400 0	C: 24400 0	C: 24400 0	C: 24400 0	C: 24400 0	C: 00000 1
42,2370	C: 24500 1	C: 00542 1	C: 24410 1	C: 20204 0	C: 00410 1	C: 10000 0	C: 00000 1	C: 00306 1

OCTAL LISTING FOR PARAGRAPH # 231, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

42,2400	C: 01367 1	C: 00510 1	C: 00000 1	C: 00204 1	C: 00004 0	C: 00000 1	C: 10507 1	C: 10200 1
42,2410	C: 00204 1	C: 00000 1	C: 24510 0	C: 24512 1	C: 60512 1	C: 54000 0	C: 24012 1	C: 60512 1
42,2420	C: 60500 1	C: 00000 1	C: 00016 0	C: 53223 1	C: 60026 0	C: 61430 1	C: 00000 1	C: 00000 1
42,2430	C: 00102 1	C: 00102 1	C: 10200 1	C: 00010 0	C: 20512 0	C: 00500 1	C: 00654 0	C: 00102 1
42,2440	C: 00200 0	C: 24512 1	C: 24512 1	C: 24512 1	C: 24512 1	C: 24512 1	C: 24512 1	C: 00102 1
42,2450	C: 00000 1	C: 16143 0	C: 10507 1	C: 10450 1	C: 00000 1	C: 06143 1	C: 00000 1	C: 00000 1
42,2460	C: 00000 1	C: 00000 1	C: 00000 1	C: 71572 1	C: 00006 1	C: 03240 1	C: 00000 1	C: 00000 1
42,2470	C: 00000 1	C: 00000 1	C: 10707 0	C: 03435 0	C: 13070 1	C: 34345 1	C: 00005 1	C: 21616 0
42,2500	C: 26113 0	C: 31713 0	C: 00070 0	C: 20460 1	C: 01065 0	C: 05740 1	C: 11414 0	C: 31463 1
42,2510	C: 07475 0	C: 14051 1	C: 00001 0	C: 03434 1	C: 00047 1	C: 21125 0	C: 77766 1	C: 50711 0
42,2520	C: 00005 1	C: 25006 0	C: 00002 0	C: 23224 1	C: 00014 1	C: 06500 1	C: 00012 1	C: 36455 0
42,2530	C: 04256 1	C: 07071 0	C: 77766 0	C: 60557 0	C: 00005 1	C: 01114 1	C: 00007 0	C: 01247 1
42,2540	C: 04324 0	C: 27600 1	C: 00036 1	C: 20440 0	C: 00035 1	C: 30400 0	C: 23420 0	C: 00000 1
42,2550	C: 01670 1	C: 20000 1	C: 07475 0	C: 16051 1	C: 14400 0	C: 00000 1	C: 05174 0	C: 13261 0
42,2560	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00714 0	C: 31463 1	C: 13412 1	C: 07534 1
42,2570	C: 05605 1	C: 03606 1	C: 00001 0	C: 16170 0	C: 00441 0	C: 34306 0	C: 07176 0	C: 21603 1
42,2600	C: 15340 1	C: 15340 1	C: 01031 1	C: 21032 0	C: 34631 1	C: 23146 0	C: 00636 1	C: 14552 0
42,2610	C: 74552 0	C: 70307 1	C: 05520 0	C: 15312 0	C: 14226 1	C: 31757 0	C: 02476 0	C: 05531 0
42,2620	C: 02727 1	C: 16415 0	C: 00007 0	C: 13734 0	C: 74477 0	C: 50643 0	C: 06265 0	C: 16004 1
42,2630	C: 04426 0	C: 31433 1	C: 34772 1	C: 07016 1	C: 01030 0	C: 33675 0	C: 01046 1	C: 15700 1
42,2640	C: 00321 1	C: 26706 1	C: 04231 0	C: 27400 0	C: 01031 1	C: 21032 0	C: 12172 0	C: 34122 1
42,2650	C: 03453 0	C: 03663 1	C: 03507 0	C: 01044 0	C: 01045 1	C: 00000 1	C: 02316 1	C: 02320 1
42,2660	C: 03663 1	C: 01117 1	C: 01121 1	C: 01123 0	C: 02117 1	C: 02121 1	C: 02140 0	C: 03462 1
42,2670	C: 03453 0	C: 02252 0	C: 01340 1	C: 00000 1	C: 00000 1	C: 01326 1	C: 01327 0	C: 00000 1
42,2700	C: 03002 0	C: 03001 0	C: 00000 1	C: 00314 1	C: 00316 0	C: 01356 0	C: 00000 1	C: 00000 1
42,2710	C: 00000 1	C: 02200 1	C: 02202 0	C: 00000 1	C: 01755 1	C: 00000 1	C: 00000 1	C: 00000 1
42,2720	C: 00000 1	C: 00000 1	C: 02200 1	C: 02202 0	C: 02204 0	C: 03466 0	C: 02256 1	C: 03620 0
42,2730	C: 02200 1	C: 02202 0	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 03605 1	C: 03575 0
42,2740	C: 02347 0	C: 02302 1	C: 02304 1	C: 02306 0	C: 02262 0	C: 03473 1	C: 03774 0	C: 03475 1
42,2750	C: 03453 0	C: 02616 1	C: 03471 0	C: 03453 0	C: 03507 0	C: 03471 0	C: 03473 1	C: 03774 0
42,2760	C: 03666 1	C: 03473 1	C: 03534 0	C: 00013 0	C: 00013 0	C: 00013 0	C: 02206 1	C: 00000 1
42,2770	C: 00000 1	C: 02200 1	C: 02202 0	C: 02204 0	C: 02616 1	C: 03475 1	C: 03664 0	C: 02640 1

OCTAL LISTING FOR PARAGRAPH # 232, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

42,3000	C: 02636 0	C: 02634 1	C: 00734 1	C: 00735 0	C: 00736 0	C: 00734 1	C: 00735 0	C: 00736 0
42,3010	C: 00035 1	C: 00736 1	C: 01000 1	C: 01106 1	C: 01107 0	C: 00000 1	C: 03453 0	C: 02262 1
42,3020	C: 02364 1	C: 03577 1	C: 02252 0	C: 02254 0	C: 02276 0	C: 02272 1	C: 03642 1	C: 03453 0
42,3030	C: 02310 1	C: 01000 1	C: 01330 0	C: 01331 1	C: 01271 1	C: 01235 1	C: 01237 0	C: 01241 1
42,3040	C: 03733 0	C: 03734 1	C: 03000 1	C: 03433 0	C: 03435 0	C: 02437 1	C: 03433 0	C: 03435 0
42,3050	C: 03437 1	C: 03622 1	C: 03624 1	C: 03626 0	C: 02222 1	C: 02224 1	C: 02226 1	C: 03501 0
42,3060	C: 03503 1	C: 03505 1	C: 03433 0	C: 03435 0	C: 03437 1	C: 01344 0	C: 01345 1	C: 00000 1
42,3070	C: 02706 1	C: 02710 0	C: 02712 1	C: 02706 1	C: 02710 0	C: 02712 1	C: 02200 1	C: 02202 0
42,3100	C: 02204 0	C: 03715 1	C: 03711 0	C: 03713 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 02737 0
42,3110	C: 02741 1	C: 02743 0	C: 01000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1	C: 00000 1
42,3120	C: 00000 1	C: 00000 1	C: 00000 1	C: 01044 0	C: 01045 1	C: 01046 1	C: 01047 0	C: 01050 0
42,3130	C: 01051 1	C: 02200 1	C: 02202 0	C: 02204 0	C: 16351 1	C: 06142 0	C: 16347 0	C: 16512 0
42,3140	C: 22347 1	C: 24443 1	C: 00000 1	C: 00553 1	C: 00143 1	C: 06347 1	C: 00000 1	C: 00512 1
42,3150	C: 00012 1	C: 01000 1	C: 24344 1	C: 24502 1	C: 00512 1	C: 00000 1	C: 16347 0	C: 16347 0
42,3160	C: 10347 0	C: 24451 1	C: 16447 1	C: 10347 0	C: 10354 1	C: 20410 0	C: 00204 0	C: 10204 0
42,3170	C: 10452 0	C: 11204 0	C: 00000 1	C: 00000 1	C: 00115 1	C: 00115 1	C: 24511 1	C: 22447 0
42,3200	C: 16347 0	C: 00351 0	C: 22756 0	C: 06102 1	C: 00503 1	C: 16347 0	C: 16347 0	C: 16347 0
42,3210	C: 16347 0	C: 16347 0	C: 16347 0	C: 00102 1	C: 02041 0	C: 10347 0	C: 24344 1	C: 24507 0
42,3220	C: 00000 1	C: 16347 0	C: 00000 1	C: 00000 1	C: 00000 1	C: 06143 1	C: 06043 0	C: 24247 0
42,3230	04616 1	C: 61043 0	07262 0	03417 0	07106 1	C: 03271 0	34321 0	54776 0
42,3240	04616 1	C: 61262 0	03435 0	23273 1	56154 1	55006 1	33274 0	56155 0
42,3250	04415 0	34320 1	54776 0	04616 1	C: 61262 0	00006 1	33300 1	52155 1
42,3260	01076 0	04415 0	24317 0	54776 0	04616 1	C: 61262 0	00136 0	C: 25660 0
42,3270	C: 31742 1	C: 01727 1	C: 01217 1	C: 00011 1	C: 32445 0	C: 02104 0	C: 10422 1	C: 05174 0
42,3300	C: 13261 0	C: 00000 1	C: 00062 0	04616 1	C: 61002 0	07262 0	10154 0	03311 1
42,3310	03342 1	63377 1	10000 0	03326 0	03342 1	03342 1	10155 1	03321 1
42,3320	03342 1	63410 0	10000 0	03326 0	03342 1	03342 1	10154 0	03402 1
42,3330	03337 0	63402 0	54154 0	43403 1	54155 1	23401 1	63420 1	54154 0
42,3340	33403 0	03334 0	03404 1	23375 0	07312 0	46250 1	26776 0	04616 1
42,3350	C: 61322 0	34755 1	54124 1	44752 1	50117 0	64317 0	54143 0	04616 1
42,3360	C: 61356 0	03425 0	56155 0	00006 1	73376 1	52155 1	50117 0	34317 0
42,3370	54776 0	04616 1	C: 61322 0	04635 0	C: 62572 0	C: 23147 1	C: 23346 1	C: 77753 0

OCTAL LISTING FOR PARAGRAPH # 233, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

42,3400	C: 41126 1	C: 03343 0	C: 00025 0	C: 37016 1	10155 1	13414 1	13414 1	13410 0
42,3410	00006 1	43302 1	20155 1	13417 1	00006 1	33302 0	13412 1	56002 C
42,3420	54144 1	07106 1	C: 03267 1	00006 1	30155 0	53007 0	04404 C	04404 C
42,3430	34755 1	56155 0	56155 0	56154 1	00144 0	56002 C	54144 1	31007 1
42,3440	00006 1	74751 1	00006 1	74737 1	22155 0	21006 0	54154 C	07106 1
42,3450	C: 03275 1	00144 0	03573 0	07106 1	C: 03534 0	03543 0	34755 1	54156 1
42,3460	33536 1	54154 C	33537 0	56155 0	07312 0	03554 C	52156 1	52124 1
42,3470	31003 C	23006 C	52155 1	07106 1	C: 03534 0	03543 0	43541 0	03561 C
42,3500	56155 0	00006 1	73540 1	20124 1	00006 1	13507 1	04145 0	31004 1
42,3510	23007 1	52155 1	07106 1	C: 03534 0	03543 0	43542 C	03561 C	52124 1
42,3520	20155 1	00006 1	13524 0	04145 C	34755 1	54156 1	07262 0	52155 1
42,3530	50145 1	52001 1	04635 0	C: 63001 0	C: 00006 1	C: 03240 1	C: 00025 0	C: 37100 1
42,3540	C: 13560 0	C: 00073 0	C: 13557 1	56156 0	60000 1	54156 1	34755 1	60155 0
42,3550	54155 1	34755 1	60154 1	56154 1	10154 0	04145 0	00002 0	04145 0
42,3560	00002 0	54156 1	10155 1	64753 1	13566 0	64753 1	60156 C	00006 1
42,3570	63572 1	04145 C	00002 0	43600 0	70777 1	63600 1	10000 0	03602 1
42,3600	C: 77743 1	03603 1	00002 0	46010 1	55040 C	04145 0	06042 1	1: 47001 0
42,3610	C: 00001 0	C: 21574 1	C: 34041 0	C: 27101 1	I: 46135 1	C: 00050 1	C: 65634 0	1: 77775 1
42,3620	C: 00001 0	C: 16205 1	C: 00015 0	I: 77624 1	C: 33647 1	I: 74375 C	C: 02723 0	C: 24001 C
42,3630	I: 53372 1	C: 02205 1	I: 77650 1	C: 65636 1	I: 77775 1	C: 00001 C	I: 53401 1	C: 00001 0
42,3640	I: 45076 1	C: 47541 1	I: 76521 C	C: 01734 C	I: 71206 0	C: 06524 1	C: 02201 0	C: 26203 1
42,3650	I: 77624 1	C: 47673 0	C: 16205 1	C: 02207 C	I: 45206 1	C: 02205 1	I: 77605 1	C: 25767 0
42,3660	C: 16207 0	I: 41215 1	C: 02205 1	C: 25767 C	C: 26205 1	C: 02205 1	I: 63256 C	C: 02205 1
42,3670	I: 72431 1	C: 06520 C	I: 40045 1	C: 02205 1	C: 65675 0	I: 40056 0	C: 65743 1	I: 47206 0
42,3700	C: 06516 0	I: 57572 0	C: 02205 1	I: 63241 0	C: 06520 0	C: 02205 1	I: 75246 C	1: 77736 0
42,3710	C: 26201 0	C: 00007 C	I: 51041 0	C: 06516 C	C: 65721 0	I: 45345 1	C: 06522 1	C: 02201 C
42,3720	C: 02201 0	I: 47375 0	C: 00001 0	C: 00007 C	I: 77772 0	C: 16205 1	C: 02201 C	I: 74356 1
42,3730	C: 06516 0	I: 71525 0	C: 02201 0	I: 52361 1	C: 06522 1	I: 63241 C	C: 02205 1	C: 02205 1
42,3740	I: 75246 0	I: 77736 C	C: 02203 1	I: 77776 1	31043 1	74747 0	00006 1	15472 1
42,3750	35017 1	05146 1	33765 0	04616 1	C: 20352 0	05563 1	05563 1	05155 0
42,3760	34751 0	05464 1	34740 0	05146 1	03606 1	C: 01463 1	C: 26501 1	C: 07463 1
42,3770	C: 03770 1	C: 03771 0	CKSM 66276 C	a	a	a	a	a

OCTAL LISTING FOR PARAGRAPH # 234, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

43,2000	59154 1	02102 1	02124 1	02172 1	02363 C	02727 1	02277 1	02114 1
43,2010	02114 1	02422 1	03152 1	13032 1	02414 1	02114 1	02414 1	02414 1
43,2020	02414 1	02424 0	03041 1	02317 0	02360 0	02145 0	02167 0	02157 0
43,2030	02162 0	02447 1	02721 1	03242 C	03157 1	03234 1	02114 1	02037 1
43,2040	03745 1	03747 0	03751 1	03753 0	03062 0	03245 1	03021 1	03024 1
43,2050	02437 0	02751 1	02066 1	03071 1	02766 0	02776 0	02114 1	03250 0
43,2060	02114 1	02114 1	02114 1	03004 0	03013 0	02115 1	03101 1	03110 1
43,2070	02114 1	03075 0	03227 0	02414 1	02114 1	02414 1	11043 0	02114 1
43,2100	30100 0	72123 1	10000 0	02114 1	34362 1	55043 0	30002 0	54155 1
43,2110	44752 1	04154 0	02113 0	00155 0	04264 1	04635 0	C: 21051 C	31010 1
43,2120	00006 1	16745 0	02114 1	C: 24100 0	02175 0	02127 1	02136 1	02430 1
43,2130	04616 1	C: 16706 1	04616 1	C: 17710 1	02125 1	02115 0	02674 C	04616 1
43,2140	C: 52354 1	04616 1	C: 17706 0	12144 0	02115 0	02674 0	04616 1	C: 53454 1
43,2150	04616 1	C: 177 6	02154 0	02115 0	05567 0	C: 00523 0	02115 0	05516 0
43,2160	C: 00013 0	12164 1	05504 0	C: 00013 0	05516 0	C: 00000 1	02115 0	05504 0
43,2170	C: 00000 1	02115 0	02175 0	02206 1	02230 1	46007 1	61001 1	00006 1
43,2200	16745 0	62205 1	00000 1	16742 1	02114 1	C: 77713 1	02430 1	02076 1
43,2210	32226 0	04616 1	C: 21334 1	05472 0	12215 1	32227 1	04616 1	C: 20621 C
43,2220	04616 1	C: 16772 1	04616 1	C: 17710 1	05472 0	05472 0	C: 06226 1	C: 12200 0
43,2230	02674 0	02076 1	42316 0	00004 0	70110 0	54110 0	32255 1	04616 1
43,2240	C: 20334 1	05472 0	12236 0	04616 1	C: 46000 0	32227 1	04616 1	C: 20621 C
43,2250	34736 1	05105 0	C: 02256 1	C: 66107 1	15472 1	C: 06111 0	04616 1	C: 52506 0
43,2260	02261 0	30167 1	75004 1	10000 0	50000 1	54000 0	40000 0	26167 0
43,2270	04616 1	C: 177 6 0	02274 1	05155 0	05567 0	C: 00503 1	05155 0	10110 0
43,2300	12115 1	12115 1	12303 1	42316 0	00004 0	70110 0	54110 0	06011 1
43,2310	34777 1	04616 1	C: 01736 1	05516 0	C: 00126 1	12115 1	C: 41000 1	02076 1
43,2320	32357 1	04616 1	C: 20353 0	02355 0	02346 1	05155 0	04616 1	C: 01735 1
43,2330	34361 1	71043 0	00006 1	15472 1	74747 0	10000 0	12320 0	32357 1
43,2340	04616 1	C: 20361 1	12355 1	12355 1	12351 0	12326 0	05504 0	C: 00254 1
43,2350	15563 0	05516 0	C: 00254 1	34362 1	05565 1	44361 0	15564 1	C: 01504 1
43,2360	05516 0	C: 00254 1	12115 1	02430 1	02076 1	32412 1	04616 1	C: 20334 1
43,2370	05472 0	02372 0	32412 0	04616 1	C: 20621 0	04616 1	C: 17202 1	04616 1

OCTAL LISTING FOR PARAGRAPH # 235, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "@" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

43,2420	C: 17710 1	05472 0	32411 1	04616 1	C: 17315 0	04616 1	C: 17710 1	05472 0
43,2410	05472 0	C: 02737 0	C: 06335 1	C: 12400 0	04433 1	34201 0	00006 1	01007 1
43,2420	04635 0	C: 62001 1	02076 1	34740 0	05105 0	C: 02005 0	C: 64064 1	05155 0
43,2430	31301 1	00006 1	16745 0	02114 1	02076 1	04635 0	C: 64002 1	02674 0
43,2440	30077 1	74743 1	10000 0	02114 1	05504 0	C: 00117 0	12453 0	02674 0
43,2450	02076 1	05504 0	C: 00063 1	34741 1	54003 0	32672 0	55777 0	34755 1
43,2460	55776 1	55575 0	00004 0	42673 0	70110 0	54110 0	32673 1	00006 1
43,2470	02033 0	26110 0	00003 1	40077 0	74743 1	10000 0	12627 1	34753 1
43,2500	55051 0	34751 0	55050 1	32667 1	04616 1	C: 20353 0	12635 1	12514 1
43,2510	12503 1	34751 0	05464 1	05155 0	31051 1	55773 1	36245 1	71773 1
43,2520	10000 0	12631 0	55775 1	34752 0	00006 1	02033 0	00006 1	12540 0
43,2530	32671 0	55044 1	32670 1	04616 1	C: 20345 1	12635 1	12523 0	12530 1
43,2540	34736 1	00006 1	05012 1	34752 0	55774 0	05203 0	C: 02003 0	C: 52104 0
43,2550	00003 1	40 77 0	74743 1	10000 0	12115 1	36245 1	71773 1	10000 0
43,2560	12575 0	32663 0	04616 1	C: 20334 1	12635 1	12567 0	12561 0	32664 1
43,2570	04616 1	C: 20334 1	12635 1	12611 1	12561 0	32665 0	04616 1	C: 20334 1
43,2600	12635 1	12603 1	12575 0	32666 0	04616 1	C: 20334 1	12635 1	12611 1
43,2610	12575 0	34755 1	55777 0	04616 1	C: 01725 1	32672 0	55777 0	34755 1
43,2620	55776 1	36245 1	71773 1	10000 0	44753 0	64752 0	12516 0	34766 1
43,2630	55777 0	34752 0	55775 1	36245 1	12544 1	34755 1	55777 0	34744 1
43,2640	04616 1	C: 01736 1	00004 0	44736 0	00006 1	03012 1	05516 0	C: 00063 1
43,2650	05472 0	34741 1	54003 0	34755 1	55777 0	34746 0	04616 1	C: 01736 1
43,2660	05516 0	C: 00117 1	12115 1	C: 04110 0	C: 04116 0	C: 04102 0	C: 04103 1	C: 01014 0
43,2670	C: 14431 1	C: 00201 1	C: 00145 1	C: 00444 0	40077 0	74741 0	10000 0	02114 1
43,2700	30101 1	74741 0	10000 0	02114 1	40103 1	74746 1	10000 0	12714 0
43,2710	30107 1	74735 0	00006 1	12114 0	40075 1	74747 0	10000 0	00002 0
43,2720	02114 1	02 76 1	34740 0	05105 0	C: 03606 1	C: 64104 0	05155 0	02117 1
43,2730	34763 1	00006 1	02012 0	10000 0	12114 0	34355 0	00006 1	06031 0
43,2740	74355 1	00006 1	12744 0	12114 0	02076 1	32226 0	04616 1	C: 20324 1
43,2750	05472 0	02752 0	32765 1	04616 1	C: 20621 0	34746 0	00006 1	05012 1
43,2760	34752 0	05203 0	C: 02035 0	C: 64100 1	15472 1	C: 12600 1	02076 1	35021 1
43,2770	05146 1	00006 1	32775 0	05165 0	C: 03242 0	C: 44104 1	02076 1	34752 0

OCTAL LISTING FOR PARAGRAPH # 216, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "0" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

43,3000	05213 0	C: 03737 1	C: 60107 1	05155 0	02117 1	02076 1	34737 0	05105 0
43,3010	C: 02022 0	C: 54104 0	05155 0	02076 1	35021 1	05105 0	C: 02640 1	C: 10104 0
43,3020	15155 1	05514 0	C: 00303 1	12115 1	05516 0	C: 00303 1	00004 0	04674 0
43,3030	C: 40154 0	02115 0	02117 1	02076 1	34737 0	05105 0	C: 02103 1	C: 46106 1
43,3040	05155 0	33061 0	70074 0	00006 1	12115 1	05516 0	C: 00010 0	05516 0
43,3050	C: 00006 1	05516 0	C: 00037 0	34747 1	70075 1	00006 1	12115 1	04635 0
43,3060	C: 64054 1	C: 10510 1	33065 1	54335 0	02115 0	C: 03706 0	05516 0	C: 00026 0
43,3070	03073 0	05514 0	C: 00026 0	05516 0	C: 10030 1	12115 1	05504 0	C: 00030 1
43,3100	02115 0	02117 1	02076 1	37713 0	05105 0	C: 02002 1	C: 76165 0	05155 0
43,3110	00014 0	44753 0	70101 0	54101 0	02115 0	02117 1	02076 1	35021 1
43,3120	05146 1	34737 1	55376 0	34755 1	55362 0	33266 0	55361 0	03543 0
43,3130	23372 0	23373 1	23265 0	54156 1	33145 1	04616 1	C: 20334 1	03142 0
43,3140	03654 0	03132 1	33266 0	55371 1	05472 0	C: 01201 0	31376 1	00006 1
43,3150	13357 1	03542 0	02076 1	35021 1	05146 1	04635 0	C: 40004 1	40104 0
43,3160	74744 0	00006 1	12114 0	34737 0	05105 0	C: 03170 1	C: 66103 0	05155 0
43,3170	06042 1	I: 77624 1	C: 27412 0	I: 43014 0	C: 04063 0	C: 04204 1	C: 67201 0	I: 77614 1
43,3200	C: 04263 1	I: 77776 1	33225 1	05544 1	C: 01626 1	C: 01554 1	00003 1	06042 1
43,3210	I: 77624 1	C: 26761 0	I: 45154 0	C: 02030 0	C: 26114 1	I: 77776 1	33226 1	50120 1
43,3220	54052 1	04635 0	C: 27423 1	I: 77634 0	C: 21051 0	C: 00051 0	C: 67223 0	05504 0
43,3230	C: 00221 0	34755 1	04635 0	C: 10040 1	02076 1	35017 1	05105 0	C: 02007 1
43,3240	C: 62064 1	05155 1	05504 0	C: 00115 1	02115 0	05516 0	C: 00115 1	02115 0
43,3250	02076 1	04635 0	C: 60030 1	C: 00061 0	C: 01373 1	C: 01461 0	C: 01773 0	C: 00060 1
43,3260	C: 60017 1	C: 17777 0	C: 25252 0	C: 52400 1	C: 76777 1	C: 01371 0	C: 03357 0	31360 0
43,3270	00006 1	13300 0	00006 1	31376 1	51377 0	52001 1	34755 1	55360 1
43,3300	00014 0	31002 0	55357 0	55362 1	25365 0	05571 1	C: 01102 0	11262 0
43,3310	34755 1	55362 0	03357 0	01357 1	10000 0	13267 0	13267 0	10000 0
43,3320	13267 0	00002 0	00006 1	23371 0	03353 1	11362 0	03333 1	03324 1
43,3330	03333 1	25366 0	01371 0	65650 1	00006 1	63337 0	03310 0	25366 0
43,3340	64757 0	50000 1	03343 0	01371 0	01371 0	01371 0	03360 1	03541 1
43,3350	01371 0	01371 0	00006 1	23361 1	04635 0	C: 03215 1	03322 1	03322 1
43,3360	34753 1	55372 1	34755 1	54003 0	33255 0	55377 1	35012 1	55373 0
43,3370	03410 1	35007 0	55377 1	35012 1	55373 0	03410 1	35007 0	55377 1

OCTAL LISTING FOR PARAGRAPH # 237, WITH PARITY BIT IN BINARY AT THE RIGHT OF EACH WORD, "a" DENOTES UNUSED FIXED MEMORY

ALL VALID WORDS ARE BASIC INSTRUCTIONS EXCEPT THOSE MARKED "I" (INTERPRETIVE OPERATOR WORDS) OR "C" (CONSTANTS)

43,3400	33256 0	55373 0	03410 1	55372 1	33253 0	55377 1	33254 1	55372 0
43,3410	00004 0	30003 1	55374 1	00006 1	51377 0	30001 0	55376 0	31377 0
43,3420	55360 1	54001 1	24001 0	50000 1	52001 1	51377 0	40001 1	51377 0
43,3430	60000 1	03314 1	31360 0	00006 1	13460 1	00006 1	51377 0	40001 1
43,3440	51377 0	52001 1	51377 0	40000 0	51377 0	60001 0	03314 1	31360 0
43,3450	00006 1	13460 1	00006 1	31376 1	51377 0	52001 1	34755 1	55360 1
43,3460	00003 1	03353 1	31374 0	54003 0	25377 0	41377 1	61373 1	00006 1
43,3470	13472 1	03410 1	11372 1	03403 0	25372 0	30003 1	64743 0	54003 0
43,3500	63264 1	00006 1	13376 1	10003 0	03371 1	35007 0	54003 0	34771 1
43,3510	55372 1	64751 1	50000 1	40000 0	11372 1	03510 0	33262 1	54020 1
43,3520	54022 0	54021 0	54023 1	60020 0	60022 1	60021 1	60023 0	63263 0
43,3530	03314 1	60020 0	60022 1	60021 1	60023 0	64753 1	03314 1	25367 1
43,3540	03322 1	34754 0	55376 0	34755 1	55374 1	34753 1	55377 1	34755 1
43,3550	55371 1	55373 0	34753 1	55375 0	31374 0	54001 1	74350 1	61373 1
43,3560	04651 1	03604 0	64741 1	03615 0	40000 0	55377 1	00006 1	13572 0
43,3570	34740 0	03573 0	35020 0	55373 0	34755 1	55371 1	34753 1	55375 0
43,3600	51373 1	30001 1	03604 0	03615 0	55372 1	61371 0	55371 1	34755 1
43,3610	61371 0	55371 1	41372 1	61373 1	00002 0	22000 1	31373 1	75012 0
43,3620	64350 0	00006 1	13711 1	11375 0	03627 1	03627 1	03711 0	10001 1
43,3630	03637 0	03637 0	03637 0	11375 0	03640 0	37752 0	03640 0	34753 1
43,3640	55375 0	11376 0	10067 1	05122 0	03646 0	03353 1	25373 1	11377 1
43,3650	03554 0	03554 0	03600 1	03600 1	41374 1	63744 0	00006 1	13146 0
43,3660	31374 0	64741 1	55374 1	03667 0	34735 1	27374 1	03703 0	74350 1
43,3670	00006 1	13701 0	63261 1	00006 1	13676 1	03703 0	33257 1	27374 1
43,3700	03713 0	63260 0	27374 1	11377 1	03546 0	34753 1	03564 0	34745 0
43,3710	03546 0	31374 0	74350 1	04331 1	54001 1	31374 0	74357 0	00006 1
43,3720	13726 0	54021 0	30001 0	74757 1	60021 1	54001 1	31376 1	00006 1
43,3730	13732 0	31300 0	11371 1	03735 0	03736 0	64753 1	55371 1	40001 1
43,3740	61371 0	67752 0	03314 1	03654 0	C: 66100 0	34755 1	13754 0	34753 1
43,3750	13754 0	34752 0	13754 0	26250 0	55165 0	02076 1	31010 1	00006 1
43,3760	13763 1	04035 0	C: 11743 1	55170 1	31165 1	55171 0	34753 1	55172 0
43,3770	04635 0	C: 11342 0	C: 03772 0	C: 03773 1	CKSM 55375 1	a	a	a

OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE
4000 TC 4045 154		5360 TC 5425 1285		6526 TC 6561 1012		00,2236 TC 00,2276 1046	
4046 TC 4065 155		5426 TC 5435 1290		6562 TC 6627 1013		00,2277 TC 00,2331 1047	
4066 TC 4101 156		5436 TC 5444 1294		6630 TC 6630 1014		00,2332 TC 00,2352 1048	
4102 TC 4122 382		5445 TC 5455 1296		6631 TC 6671 1015		00,2353 TC 00,2421 1049	
4124 TC 4144 441		5456 TC 5456 1297		6672 TC 6725 1016		00,2422 TC 00,2436 1050	
4145 TC 4153 448		5463 TC 5463 1299		6726 TC 6751 1017		00,2437 TC 00,2477 1051	
4154 TC 4203 454		5464 TC 5503 1344		6752 TC 7005 1018		00,2500 TC 00,2537 1052	
4204 TC 4206 456		5504 TC 5522 1365		7006 TC 7007 1019		00,2540 TC 00,2567 1053	
4207 TC 4243 457		5533 TC 5543 1366		7010 TC 7064 1020		00,2570 TC 00,2607 1054	
4244 TC 4302 458		5544 TC 5562 1369		7065 TC 7073 1021		00,2610 TC 00,2624 1055	
4303 TC 4335 462		5563 TC 5566 1370		7074 TC 7105 1022		00,2625 TC 00,2641 1056	
4336 TC 4377 463		5567 TC 5617 1371		7106 TC 7140 1023		00,2642 TC 00,2653 1057	
4400 TC 4436 464		5620 TC 5635 1372		7141 TC 7156 1024		00,2654 TC 00,2720 1058	
4437 TC 4461 466		5636 TC 5715 1373		7157 TC 7217 1025		00,2721 TC 00,2747 1059	
4462 TC 4511 467		5716 TC 5742 1374		7220 TC 7241 1026		00,2750 TC 00,3006 1060	
4512 TC 4522 523		5743 TC 5764 1395		7242 TC 7257 1027		00,3007 TC 00,3022 1061	
4523 TC 4536 524		5765 TC 5766 28		7260 TC 7320 1028		00,3023 TC 00,3072 1062	
4537 TC 4563 525		6000 TC 6000 40		7321 TC 7333 1029		00,3073 TC 00,3073 1062	
4564 TC 4577 526		6001 TC 6010 225		7334 TC 7344 1030		00,3074 TC 00,3132 1064	
4600 TC 4615 527		6011 TC 6021 518		7345 TC 7403 1031		00,3133 TC 00,3150 1065	
4616 TC 4644 990		6022 TC 6024 564		7404 TC 7427 1032		00,3151 TC 00,3173 1066	
4645 TC 4673 991		6025 TC 6031 596		7430 TC 7462 1033		00,3174 TC 00,3206 1067	
4674 TC 4726 992		6032 TC 6041 743		7463 TC 7530 1034		00,3207 TC 00,3231 1068	
4727 TC 4731 993		6042 TC 6061 594		7531 TC 7574 1035		00,3232 TC 00,3277 1069	
4732 TC 4762 1087		6062 TC 6105 995		7575 TC 7626 1036		00,3300 TC 00,3342 1070	
4763 TC 5010 1088		6106 TC 6117 556		7627 TC 7657 1037		00,3343 TC 00,3405 1071	
5011 TC 5031 1089		6120 TC 6146 597		7660 TC 7712 1038		00,3406 TC 00,3455 1072	
5022 TC 5071 1094		6147 TC 6215 598		7713 TC 7725 1039		00,3456 TC 00,3516 1073	
5072 TC 5127 1095		6216 TC 6217 599		7726 TC 7752 1090		00,3517 TC 00,3552 1074	
5130 TC 5132 1096		6220 TC 6251 1000		7753 TC 7756 1292		00,3553 TC 00,3607 1075	
5133 TC 5164 1097		6252 TC 6265 1001		7757 TC 7760 1449		00,3610 TC 00,3651 1076	
5165 TC 5172 1108		6266 TC 6276 1002		7761 TC 7762 28		00,3652 TC 00,3713 1077	
5173 TC 5234 1111		6277 TC 6336 1003		00,2000 TC 00,2016 1005		00,3714 TC 00,3734 1078	
5235 TC 5235 1112		6337 TC 6356 1004		00,2017 TC 00,2041 1039		00,3735 TC 00,3767 1367	
5236 TC 5260 1113		6357 TC 6374 1006		00,2042 TC 00,2100 1040		00,3770 TC 00,3774 1368	
5261 TC 5276 1121		6375 TC 6416 1007		00,2101 TC 00,2120 1041		00,3775 TC 00,3776 28	
5277 TC 5300 1122		6417 TC 6436 1008		00,2121 TC 00,2143 1042		01,2000 TC 01,2001 43	
5301 TC 5310 1123		6437 TC 6462 1009		00,2144 TC 00,2171 1043		01,2002 TC 01,2032 239	
5311 TC 5326 1284		6463 TC 6472 1010		00,2172 TC 00,2213 1044		01,2033 TC 01,2070 240	
5327 TC 5357 1288		6473 TC 6525 1011		00,2214 TC 00,2235 1045		01,2071 TC 01,2133 241	

OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE
01,2134 TC 01,2174 242		04,2074 TC 04,2027 225		05,2000 43		06,2012 TC 06,2023 157	
01,2175 TC 01,2213 243		04,2030 TC 04,2037 226		05,2001 TC 05,2020 51		06,2024 TC 06,2074 158	
01,2211 TC 01,2234 255		04,2040 TC 04,2072 228		05,2021 TC 05,2064 52		06,2075 TC 06,2115 159	
01,2225 TC 01,2313 256		04,2073 TC 04,2142 229		05,2065 194		06,2116 TC 06,2127 160	
01,2314 TC 01,2344 257		04,2143 TC 04,2205 230		05,2066 TC 05,2136 195		06,2130 TC 06,2171 161	
01,2345 TC 01,2372 1079		04,2206 TC 04,2251 231		05,2137 TC 05,2171 196		06,2172 TC 06,2207 162	
01,2373 TC 01,2427 1080		04,2252 TC 04,2321 232		05,2172 TC 05,2231 197		06,2210 TC 06,2226 163	
01,2430 TC 01,2447 1081		04,2322 TC 04,2365 233		05,2232 TC 05,2275 198		06,2227 164	
01,2450 TC 01,2467 1082		04,2366 TC 04,2422 234		05,2276 TC 05,2302 200		06,2230 TC 06,2274 165	
01,2470 TC 01,2516 1083		04,2423 TC 04,2460 235		05,2303 TC 05,2343 201		06,2275 TC 06,2342 166	
01,2517 TC 01,2533 1084		04,2461 TC 04,2517 236		05,2344 TC 05,2356 202		06,2343 TC 06,2373 167	
01,2534 TC 01,2555 1085		04,2520 TC 04,2557 245		05,2357 TC 05,2406 203		06,2374 TC 06,2415 168	
01,2556 TC 01,2601 1086		04,2560 TC 04,2576 371		05,2407 TC 05,2445 205		06,2416 TC 06,2433 169	
01,2602 TC 01,2636 1098		04,2577 TC 04,2612 372		05,2446 206		06,2434 TC 06,2457 170	
01,2637 TC 01,2704 1099		04,2613 TC 04,2617 373		05,2447 TC 05,2511 212		06,2460 TC 06,2513 171	
01,2705 TC 01,2760 1100		04,2620 TC 04,2630 459		05,2512 TC 05,2566 213		06,2514 TC 06,2532 172	
01,2761 TC 01,2772 1101		04,2631 TC 04,2637 466		05,2567 TC 05,2644 214		06,2533 TC 06,2555 173	
01,2773 TC 01,3023 1102		04,2640 TC 04,2715 701		05,2645 TC 05,2664 215		06,2556 TC 06,2564 174	
01,3024 TC 01,3072 1103		04,2716 TC 04,2774 702		05,2665 TC 05,2731 216		06,2565 TC 06,2613 175	
01,3073 TC 01,3103 1104		04,2775 TC 04,3010 575		05,2732 TC 05,3006 217		06,2614 TC 06,2621 176	
01,3104 TC 01,3151 1105		04,3011 TC 04,3045 1177		05,3007 TC 05,3054 218		06,2622 TC 06,2647 177	
01,3152 TC 01,3154 1106		04,3046 TC 04,3060 1178		05,3055 TC 05,3104 219		06,2650 TC 06,2670 178	
01,3155 TC 01,3216 1107		04,3061 TC 04,3111 1179		05,3105 TC 05,3151 220		06,2671 TC 06,2702 179	
01,3207 TC 01,3221 1108		04,3112 TC 04,3146 1180		05,3152 TC 05,3221 221		06,2703 TC 06,2717 180	
01,3232 TC 01,3260 1114		04,3147 TC 04,3173 1216		05,3222 TC 05,3277 222		06,2720 TC 06,2754 181	
01,3261 TC 01,3310 1115		04,3174 TC 04,3234 1217		05,3300 TC 05,3352 223		06,2755 TC 06,3005 182	
01,3311 TC 01,3354 1116		04,3235 TC 04,3252 1322		05,3354 TC 05,3377 224		06,3006 TC 06,3025 183	
01,3355 TC 01,3371 1117		04,3253 TC 04,3255 1323		05,3400 TC 05,3404 824		06,3026 TC 06,3033 184	
01,3372 TC 01,3374 1118		04,3256 TC 04,3300 1328		05,3405 TC 05,3452 825		06,3034 TC 06,3051 185	
01,3375 TC 01,3407 1119		04,3301 TC 04,3353 1329		05,3453 TC 05,3467 826		06,3052 TC 06,3070 186	
01,3410 TC 01,3452 1120		04,3354 TC 04,3361 1330		05,3470 TC 05,3471 845		06,3071 TC 06,3110 187	
01,3453 TC 01,3501 1122		04,3362 TC 04,3407 1379		05,3472 TC 05,3515 983		06,3111 TC 06,3137 188	
01,3502 TC 01,3526 1124		04,3410 TC 04,3461 1380		05,3516 TC 05,3574 984		06,3140 TC 06,3151 189	
01,3527 TC 01,3566 1293		04,3462 TC 04,3517 1381		05,3575 TC 05,3625 985		06,3152 TC 06,3163 190	
01,3567 TC 01,3611 1294		04,3520 TC 04,3562 1382		05,3636 TC 05,3705 986		06,3164 TC 06,3230 192	
01,3612 TC 01,3662 1295		04,3563 TC 04,3622 1383		05,3706 TC 05,3710 988		06,3231 TC 06,3270 193	
01,3663 TC 01,3707 1296		04,3623 TC 04,3677 1384		05,3711 TC 05,3760 989		06,3271 TC 06,3334 327	
01,3710 TC 01,3746 1297		04,3700 TC 04,3740 1385		05,3761 TC 05,3773 1237		06,3335 328	
01,3747 TC 01,3776 1298		04,3741 TC 04,3751 1386		05,3774 TC 05,3775 25		06,3336 TC 06,3363 329	
04,2000 TC 04,2023 45		04,3752 TC 04,3753 28		06,2010 TC 06,2011 156		06,3364 TC 06,3423 330	

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06,3424 TC 06,3432 331		07,3423 TC 07,3455 1312		10,3563 TC 10,3573 1372		12,2236 TC 12,2307 1169	
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25,2646 TC 25,2714 550		26,2632 TC 26,2713 582		27,3113 TC 27,3174 772		30,3245 TC 30,3312 907	
25,2715 TC 25,2724 551		26,2714 TC 26,2773 583		27,3175 TC 27,3216 773		30,3313 TC 30,3320 908	
25,2725 TC 25,2772 552		26,2774 TC 26,3055 584		27,3217 TC 27,3254 774		30,3321 TC 30,3362 909	
25,2773 TC 25,3045 553		26,3056 TC 26,3136 585		27,3255 TC 27,3266 775		30,3363 TC 30,3424 910	

OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE
30,3425 TC 30,3467	911	31,3551 TC 31,3620	918	33,2000 TC 33,2001	39	34,2006 TC 34,2056	620
30,3470 TC 30,3517	912	31,3621 TC 31,3665	919	33,2002 TC 33,2024	41	34,2057 TC 34,2115	625
30,3520 TC 30,3564	913	31,3666 TC 31,3724	920	33,2025 TC 33,2030	42	34,2116 TC 34,2177	636
30,3565 TC 30,3606	914	31,3725 TC 31,3740	921	33,2031 TC 33,2040	44	34,2200 TC 34,2261	637
30,3607 TC 30,3656	915	31,3741 TC 31,3742	924	33,2041 TC 33,2044	45	34,2262 TC 34,2343	638
30,3657 TC 30,3713	916	32,2000 TC 32,2000	40	33,2045 TC 33,2112	595	34,2344 TC 34,2425	639
30,3714 TC 30,3745	917	32,2001 TC 32,2004	41	33,2113 TC 33,2136	600	34,2426 TC 34,2507	640
30,3746 TC 30,3761	918	32,2005 TC 32,2007	207	33,2137 TC 33,2177	601	34,2510 TC 34,2571	641
30,3762 TC 30,3762	24	32,2010 TC 32,2062	208	33,2200 TC 33,2205	850	34,2572 TC 34,2653	642
31,2000 TC 31,2001	39	32,2063 TC 32,2136	209	33,2206 TC 33,2255	855	34,2654 TC 34,2735	643
31,2002 TC 31,2006	40	32,2137 TC 32,2214	210	33,2256 TC 33,2323	856	34,2736 TC 34,3015	644
31,2007 TC 31,2056	611	32,2215 TC 32,2216	211	33,2324 TC 33,2373	857	34,3016 TC 34,3051	645
31,2057 TC 31,2140	612	32,2217 TC 32,2242	495	33,2374 TC 33,2414	858	34,3052 TC 34,3061	646
31,2141 TC 31,2143	613	32,2243 TC 32,2324	496	33,2415 TC 33,2432	862	34,3062 TC 34,3077	647
31,2144 TC 31,2173	786	32,2325 TC 32,2365	497	33,2433 TC 33,2437	863	34,3100 TC 34,3117	648
31,2174 TC 31,2235	787	32,2366 TC 32,2420	573	33,2440 TC 33,2446	867	34,3120 TC 34,3132	649
31,2236 TC 31,2275	788	32,2421 TC 32,2512	574	33,2447 TC 33,2460	868	34,3133 TC 34,3204	650
31,2276 TC 31,2344	789	32,2513 TC 32,2547	575	33,2461 TC 33,2530	869	34,3205 TC 34,3266	651
31,2345 TC 31,2345	790	32,2550 TC 32,2601	603	33,2521 TC 33,2550	870	34,3267 TC 34,3270	652
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31,2366 TC 31,2415	792	32,2636 TC 32,2702	605	33,2624 TC 33,2666	872	34,3335 TC 34,3342	785
31,2416 TC 31,2464	793	32,2703 TC 32,2741	606	33,2667 TC 33,2744	873	34,3342 TC 34,3362	824
31,2465 TC 31,2536	794	32,2742 TC 32,2776	607	33,2745 TC 33,2770	874	34,3363 TC 34,3371	825
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31,2576 TC 31,2625	796	32,3033 TC 32,3102	779	33,3044 TC 33,3116	876	34,3444 TC 34,3445	827
31,2626 TC 31,2670	797	32,3103 TC 32,3155	780	33,3117 TC 33,3170	877	34,3446 TC 34,3453	845
31,2671 TC 31,2745	798	32,3156 TC 32,3230	781	33,3171 TC 33,3246	878	34,3454 TC 34,3512	847
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31,2767 TC 31,3040	800	32,3264 TC 32,3314	810	33,3317 TC 33,3370	880	34,3571 TC 34,3617	886
31,3041 TC 31,3100	801	32,3315 TC 32,3372	811	33,3371 TC 33,3437	881	34,3620 TC 34,3647	887
31,3101 TC 31,3147	802	32,3373 TC 32,3454	812	33,3440 TC 33,3503	882	34,3650 TC 34,3651	35
31,3150 TC 31,3224	803	32,3455 TC 32,3536	813	33,3504 TC 33,3550	883	35,2000 TC 35,2021	617
31,3225 TC 31,3270	804	32,3537 TC 32,3546	814	33,3551 TC 33,3557	884	35,2022 TC 35,2033	618
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31,3511 TC 31,3521	809	32,3740 TC 32,3760	830	33,3741 TC 33,3761	890	35,2302 TC 35,2353	631
31,3522 TC 31,3531	810	32,3761 TC 32,3763	861	33,3762 TC 33,3763	34	35,2354 TC 35,2374	632
31,3532 TC 31,3550	817	32,3764 TC 32,3765	34	34,2000 TC 34,2005	619	35,2375 TC 35,2414	633

OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE	OCCUPIED LOCATIONS	PAGE
35,2415 TC 35,2436 634		36,2521 TC 36,2565 732		37,3113 TC 37,3132 703		40,3476 TC 40,3505 450	
35,2437 TC 35,2454 653		36,2566 TC 36,2574 733		37,3133 TC 37,3211 704		40,3506 TC 40,3523 451	
35,2455 TC 35,2510 661		36,2575 TC 36,2630 734		37,3212 TC 37,3273 705		40,3524 TC 40,3547 452	
35,2511 TC 35,2571 662		36,2631 TC 36,2670 735		37,3274 TC 37,3351 706		40,3550 TC 40,3551 453	
35,2572 TC 35,2634 663		36,2671 TC 36,2741 736		37,3352 TC 37,3407 707		40,3552 TC 40,3576 454	
35,2635 TC 35,2673 666		36,2742 TC 36,3004 737		37,3410 TC 37,3436 852		40,3577 TC 40,3642 460	
35,2674 TC 35,2753 667		36,3005 TC 36,3050 738		37,3437 TC 37,3502 853		40,3644 TC 40,3645 461	
35,2754 TC 35,3035 668		36,3051 TC 36,3116 739		37,3503 TC 37,3535 854		40,3646 TC 40,3713 472	
35,3036 TC 35,3117 669		36,3117 TC 36,3136 740		37,3536 TC 37,3536 864		40,3714 TC 40,3736 473	
35,3120 TC 35,3201 670		36,3137 TC 36,3151 741		37,3537 TC 37,3610 865		40,3737 TC 40,3755 703	
35,3202 TC 35,3203 671		36,3152 TC 36,3152 742		37,3611 TC 37,3651 866		40,3756 TC 40,3757 36	
35,3204 TC 35,3215 672		36,3153 TC 36,3174 746		37,3652 TC 37,3710 1325		41,2070 TC 41,2033 407	
35,3216 TC 35,3273 673		36,3175 TC 36,3241 747		37,3711 TC 37,3744 1326		41,2034 TC 41,2112 408	
35,3274 TC 35,3306 674		36,3242 TC 36,3311 748		37,3745 TC 37,3770 1327		41,2113 TC 41,2167 409	
35,3307 TC 35,3351 675		36,3312 TC 36,3355 749		37,3771 TC 37,3772 36		41,2170 TC 41,2220 410	
35,3352 TC 35,3356 676		36,3356 TC 36,3424 750		40,2000 TC 40,2042 300		41,2221 TC 41,2264 411	
35,3357 TC 35,3431 677		36,3425 TC 36,3472 751		40,2043 TC 40,2076 301		41,2265 TC 41,2342 412	
35,3422 TC 35,3477 678		36,3473 TC 36,3543 752		40,2077 TC 40,2150 305		41,2342 TC 41,2354 413	
35,3500 TC 35,3514 679		36,3544 TC 36,3611 753		40,2151 TC 40,2216 400		41,2355 TC 41,2432 415	
35,3515 TC 35,3561 680		36,3612 TC 36,3666 754		40,2217 TC 40,2277 401		41,2433 TC 41,2477 416	
35,3562 TC 35,3602 681		36,3667 TC 36,3737 755		40,2300 TC 40,2351 402		41,2500 TC 41,2552 417	
35,3603 TC 35,3612 682		36,3740 TC 36,3770 756		40,2352 TC 40,2424 403		41,2553 TC 41,2621 418	
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35,3632 TC 35,3655 684		37,2000 TC 37,2001 44		40,2467 TC 40,2542 405		41,2664 TC 41,2743 428	
35,3656 TC 35,3701 733		37,2002 TC 37,2036 374		40,2543 TC 40,2614 406		41,2744 TC 41,3017 429	
35,3702 TC 35,3706 734		37,2037 TC 37,2117 375		40,2615 TC 40,2647 419		41,3020 TC 41,3072 430	
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35,3726 TC 35,3735 741		37,2172 TC 37,2251 377		40,2725 TC 40,2765 421		41,3145 TC 41,3214 432	
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36,2000 TC 36,2021 38		37,2275 TC 37,2346 379		40,3025 TC 40,3043 426		41,3236 TC 41,3263 439	
36,2022 TC 36,2023 40		37,2347 TC 37,2400 380		40,3044 TC 40,3067 433		41,3264 TC 41,3335 440	
36,2024 TC 36,2045 723		37,2401 TC 37,2457 381		40,3070 TC 40,3143 434		41,3336 TC 41,3360 441	
36,2046 TC 36,2112 724		37,2460 TC 37,2477 382		40,3144 TC 40,3213 435		41,3361 TC 41,3370 442	
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36,2151 TC 36,2226 726		37,2536 TC 37,2576 385		40,3234 TC 40,3304 443		41,3423 TC 41,3425 446	
36,2227 TC 36,2274 727		37,2577 TC 37,2656 386		40,3305 TC 40,3341 444		41,3426 TC 41,3476 449	
36,2275 TC 36,2341 728		37,2657 TC 37,2736 387		40,3342 TC 40,3355 445		41,3477 TC 41,3523 450	
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41,3734 TC 41,3742	471	43,2157 TC 43,2171	266	43,3772 TC 43,3773	36		
41,3743 TC 41,3744	36	43,2172 TC 43,2177	267				
42,2050 TC 42,2061	46	43,2200 TC 43,2227	268				
42,2072 TC 42,2134	276	43,2237 TC 43,2275	269				
42,2085 TC 42,2053	283	43,2276 TC 43,2316	270				
42,2054 TC 42,2064	288	43,2317	271				
42,2065 TC 42,2102	289	43,2320 TC 43,2362	272				
42,2103 TC 42,2141	305	43,2363 TC 43,2413	274				
42,2142 TC 42,2207	306	43,2414 TC 43,2423	275				
42,2210 TC 42,2243	307	43,2434 TC 43,2436	276				
42,2244 TC 42,2270	308	43,2437 TC 43,2501	277				
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42,2640 TC 42,2714	315	43,2766 TC 43,3003	284				
42,2715 TC 42,2776	316	43,3004 TC 43,3023	285				
42,2777 TC 42,3060	317	43,3024 TC 43,3031	286				
42,3061 TC 42,3135	318	43,3032 TC 43,3040	287				
42,3136 TC 42,3217	319	43,3041 TC 43,3061	288				
42,3220 TC 42,3227	320	43,3062 TC 43,3070	289				
42,3230 TC 42,3232	422	43,3071 TC 43,3100	290				
42,3233 TC 42,3306	423	43,3101 TC 43,3140	291				
42,3307 TC 42,3367	424	43,3141 TC 43,3151	292				
42,3370 TC 42,3443	425	43,3152 TC 43,3156	293				
42,3444 TC 42,3451	426	43,3157 TC 43,3216	298				
42,3452 TC 42,3502	436	43,3217 TC 43,3247	299				
42,3503 TC 42,3560	437	43,3250 TC 43,3252	300				
42,3561 TC 42,3605	438	43,3253 TC 43,3311	1276				
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42,3607 TC 42,3670	489	43,3360 TC 43,3423	1278				
42,3671 TC 42,3752	490	43,3434 TC 43,3513	1279				
42,3753 TC 42,3767	491	43,3514 TC 43,3556	1280				
42,3770 TC 42,3771	36	43,3557 TC 43,3635	1281				
43,2000 TC 43,2045	262	43,3636 TC 43,3714	1282				
43,2146 TC 43,2114	263	43,3715 TC 43,3744	1283				
43,2115 TC 43,2123	264	43,3745 TC 43,3764	1278				

THE SUBROUTINES IN THIS PROGRAM ARE AS FOLLOWS:

LLMERASE .128
LEMCNAID .099
LEMP20S .140
LEMP30S .105
KISSING .053
FLY .146
LEMP50S .118
SKIPPER .097
LMDAP .023

THE ASSEMBLY WAS GOOD AND MANUFACTURABLE. NO LINES WERE CUSSED.

BINARY RECORDS FOR "LUMINARY.P116" SUCCESSFULLY STORED.

WILSON JONES

GrayLine

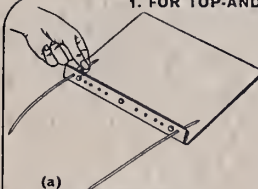
NYLON POST BINDER

25-1411N

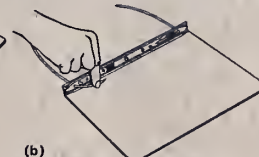
2 PURPOSE BINDER

This binder may be used to bind both marginal-punched sheets and forms punched with $2\frac{3}{4}$ ", $4\frac{1}{4}$ ", 6", 7", $8\frac{1}{2}$ ", $13\frac{1}{2}$ " and $14\frac{1}{4}$ " center-to-center holes.

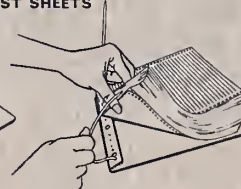
1. FOR TOP-AND-BOTTOM LOADING OF UNBURST SHEETS



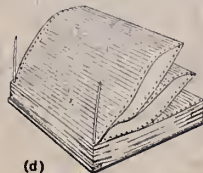
(a)
Insert posts thru end holes of bottom cover stub. Allow approximately 2 inches of the posts to extend inside the metal channel.



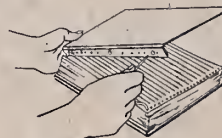
(b)
Bend these sections down into the channel, toward the center. Move the plastic slide locks over the posts and toward each end of the stub until they are snug.



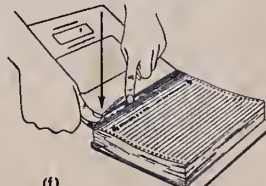
(c)
Gather forms in even stack. Insert posts in top holes at both sides of forms.



(d)
At this point the forms will be held in the binder in this unburst continuous fashion so that they can be read like the leaves of a stenographer's note book.



(e)
Hold the top cover over the sheet body with the stub turned under. Insert the upper end of the posts thru the end holes of the stub.



(f)
Bend the exposed lengths of the posts down into the top cover channel. Move the slide locks over the posts toward the outside ends of the channel until snug.

2. FOR CONVENTIONALLY PUNCHED LOOSE LEAF FORMS AND STRIPPED UNBURST FORMS

Follow steps (a) thru (f), except that posts should be inserted thru holes in stub that correspond to holes in forms to be bound.

H 25 U



Made in U.S.A.

